e-ISSN: 0975-5160, p-ISSN: 2820-2651

Available online on www.ijtpr.com

International Journal of Toxicological and Pharmacological Research 2024; 14(2); 79-81

Original Research Article

A Prospective Clinico- Bacteriological Study of Surgical Site Infection

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Received: 11-12-2023 / Revised: 12-01-2024 / Accepted: 10-02-2024
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Conflict of interest: Nil

Abstract

Background and Objectives: Surgical site infections (SSI) still remains a significant problem following an operation and the third most frequently reported nosocomial infections accounting for 14 to 16% of all nosocomial infections. This study aims at determining the risk factors and incidence of surgical site infections.

Methods: The material for the present study was obtained from patient's undergone surgery in Department of General Surgery, JNKTMCH Madhepura, Study duration of two Years. Surgical site were considered to be infected according to the definition by NNIS. The wounds were classified according to the wound contamination class system proposed.

Results: A study of 400 operated cases was carried out of which 39 were diagnosed to be having surgical site infection as per the CDC criteria. Thus the incidence of SSI in this study is 9.75%.

Conclusion: Incidence of surgical site infection was more in emergency surgery case as compare to elective.

Keywords: SSI, Emergency, Elective.

Introduction

Surgical site infections (SSI) still remains a significant problem following an operation and the third most frequently reported nosocomial infections accounting for 14 to 16% of all nosocomial infections. SSI contribute significantly to increased health care costs, morbidity and mortality related to surgical operations in terms of prolonged hospital stay and lost work days. Surgical infections are those that occur as a result of surgical procedure or those that require surgical intervention as part of their treatment. They are characterized a breach of mechanical / anatomic defense mechanisms and are associated with greater morbidity, significant mortality and increased cost of care [1].

The 16th century French surgeon Ambroise Pare is famously quoted as saying"I dressed the wound, God healed it". The implication was that wounds heal by a mysterious, incomprehensible force as long as local care is adequate. This attitude, unfortunately, has endured. In truth, it is only a quaint reminder of the ignorance that has lasted into the present century. [2]

Material and Methods

Source of Data: The material for the present study was obtained from patient's undergone surgery in Department of General Surgery, at JNKTMCH, Madhepura, Bihar Study duration of Two Years. Surgical site were considered to be infected according to the definition by NNIS. The wounds were classified according to the wound contamination class system proposed.

Inclusion Criteria:

All patients above 12 years undergoing surgery in Department of General Surgery.

Exclusion Criteria:

- Patients with known preoperative infection including dirty wounds.
- Those undergoing revision surgery.
- Stitch abscess cases.

Method of Collection of Data

An elaborate study of these cases with regard to date of admission, history, clinical features date of surgery, type of surgery, emergency or elective, preoperative preparation and postoperative management is done till patient is discharged from hospital, and then followed up the patient on OPD basis for any signs of wound infection.

The wounds were examined for suggestive Signs/Symptoms of infection in the post operative period, during wound dressing or when the dressings were soaked.

In history, presenting complaints, duration, associated diseases, coexistent infections at a remote body

site, personal history including diet, smoking, and alcoholism were noted.

Operative findings which include, type of incision, wound contamination, drain used and its type, and duration of operation were studied.

Postoperative findings which included, day of wound infection, day of 1st dressing and frequency of change of dressing.

Findings on the day of diagnosis of wound infection were noted which included fever, erythema, discharge, type and colour and the exudates was collected from the depth of the wound using sterile cotton swab and was sent to microbiology department for culture and sensitivity.

Results

Table 1: incidence of surgical site infection

Total Number of Cases	Number of Cases Infected	Percentage
400	39	9.75

A study of 400 operated cases was carried out of which 39 were diagnosed to be having surgical site infection as per the CDC criteria. Thus the incidence of SSI in this study is 9.75%.

Table 2: In relation to sex

Sex	No. of Cases	Infected	Percentage
Male	282	26	9.21
Female	118	13	11.01

Incidence of infection among males is 9.21.%; whereas incidence of infection among females is 11.01%.

Table 3: incidence in relation to age group

Age	No. Of Cases	Infected	Percentage
12-20	51	2	3.92
21-30	114	7	6.14
31-40	77	7	9.09
41-50	68	9	13.2
51-60	49	11	22.4
61-70	7	3	9.37
71-80	9	0	0
TOTAL	400	39	

Infection is more commonly seen among 51 to 60y old patients with an incidence of 22.4% followed by among 41 to 50 and 61 to 70y old patients. Youngest patient being 19yr old and oldest being 70y old.

Table 4: incidence in relation to type of operation

Type	No. of Cases	Infected	Percentage
ELECTIVE	300	15	5
EMERGENCY	100	24	24
TOTAL	400	39	9.75

Incidence of infection among Emergency surgery is 24% whereas among Elective is 5%.

Table 5: incidence in relation to anemia, hypoproteinemia, diabetes, remote infections and malignancies

Risk Factors	No. of Cases	Infected	Percentage
Anemia	61	15	24.6
Hypoproteinemia	40	8	20
Diabetes Mellitus	28	5	17.8
UTI	30	5	16.6
RTI	36	8	22.2
Malignancy	21	4	19

Most of the patients were anemic (15.5%) with infection rate of 24.59%. Hypoproteinemic (10%) patients had infection rate of 20%, diabetes mellitus (7%) had infection rate of 17.8%, UTI (7.5%) had 16.6%, RTI (9%) had infection rate of 22.2% and malignancies (5.25%) had infection rate of 19.04%.

Discussion

The present study was conducted at department of general surgery, Jan nayak Karpuri Thakur Medical College and Hospital, Madhepura. This is a prospective study of 400 cases who underwent surgery and were followed up from the day of operation to 30 days after discharge to look for the development of SSI.

The overall infection rate for a total of 400 cases was 9.75%. The incidence rate in this study is well within the infection rates of 2.8% to 17% seen in other studies. Different studies from India at different places have shown the SSI rate to vary from 6.09% to

38.7%.[3] The infection rate in Indian hospitals is much higher than that in other countries; for instance, in the USA, it is 2.8% and it is 2-5% in European countries. The higher infection rate in Indian hospitals may be due to the poor set up of our hospitals and also due to the lack of attention towards the basic infection control measures. The following table shows incidence in various other studies. [4]

The rates of SSIs in male patients were 9.21% and in female patients, they were 11.01%. The significance of this observation is not well understood.

The present study shows that the incidence of SSI is more among 51-60 yrs age group followed by 41- 50 yr group probably because of more number of surgeries performed in these age groups. The younger age groups had lesser incidence of SSI.

This confirms the understanding that there is a gradual rise in incidence of wound infection as age advances although in this study the 61-70 age group had lesser incidence owing to lesser number of surgeries in this group. Likewise Cruse and Foord observed in their study that older patients are more likely to develop infection in clean wounds than younger patient [5].

Similar findings were demonstrated by Mead, et al, who observed an increased wound infection in patients less than 1 year old (2.7%) or greater than 50 years old (2.8%) versus those 1 to 50 years old (0.7%).

The high incidence of 22.4% in patients aged 51- 60 years in our study is perhaps due to decreased immunocompetence and increased chances of comorbid factors like Diabetes Mellitus, Hypertension, Chronic ailments like Asthma, conditions requiring Steroid therapy and personal habits like Smoking and Alcoholism. Age, obviously is an immutable patient characteristic and even, if it is a risk factor for wound infection, it appears to be at most a modest one.

The high rates of infection in emergency surgeries can be attributed to inadequate operative preparation, the underlying conditions which predisposed to the emergency surgery and the more frequency of contaminated wounds in emergency surgeries.

Incidence among the risk factors like anemia 24.59%, hypoprotenimia 20%, diabetes mellitus 17.8%, UTI 16.6%, RTI 22.2% and malignancies 19.04%. Similar results were also obtained in other studies.[5]

Because being the reduced immunocompetence, wound healing factors, hyperglycemia, and pre-existing infections.

Conclusion

Incidences of surgical site infection were more in emergency surgery case as compare to elective.

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