Original Research Paper

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Surgery

SURGICAL SITE INFECTION IN CONVENTIONAL ABDOMINAL SURGERIES IN AIMSR BATHINDA -RISK FACTORS AND INCIDENCE

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ABSTRACT

Background: Surgical site infection is third most common infection and responsible for increasing cost, increase hospital stays, morbidity and mortality related to surgical operations. This study aimed to determine the incidence of SSI in the abdominal surgeries and to identify risk factors associated with the development of SSI.

Methods: The material for the present study was obtained from patient's undergone abdominal surgery in Department of General Surgery, AIMSR Bathinda, from 31 December 2015 to 31st December 2016. 120 Patients will be included in the study that fulfils the inclusion criteria.

Results: In our study included 120 General Surgical patients, out of which 25 were infected. So the incidence is 20%. Incidence of infection among males is 16.8% whereas incidence of infection among females is 32.2%. Infection is more commonly seen above >60 years old patients with an incidence of 36.6% and middle age group 31-40 years which is 21.4%. Incidence of infection among Emergency surgeries is 44.11% whereas among Elective surgeries is 11.6%. Out of 120 cases 65 were clean cases, 35 were clean-contaminated 17 were contaminated and 3 were infected cases. Most of the patients were anaemic and diabetics with infection rate of 36% and 39% respectively. Hypoproteinemia patients had infection rate of 25%, and Hypertensive patients had infection rate of 22%. Surgical site infection was more among perforations, hepatic abscess, chronic cholecystitis, obstruction and appendicitis. Incidence was more in surgeries having duration of >2 hours. The number of person increases the rate of incidence also increases to 41%. *Klebsiella* and *Staphylococcus* were the most common isolated organisms.

Conclusions: Incidence of Surgical Site Infection at AIMSR Bathinda is 20%. Older age group is commonly involved. Emergency cases have high infection rate. Risk factors like anaemia, diabetes mellitus, Hypoproteinemia, and hypertension are associated with increased Surgical Site Infection rate. Longer the duration of surgery more is the Surgical Site Infection rate. Contaminated cases had more SSI rate as compared to clean-contaminated cases. More the number of people in operation theatre more the rate of infection. Gram -ve bacilli were more common isolates detected. *Klebsiella spp.* being the most common organism isolated in the study.

KEYWORDS : surgical site infections (SSI),Incidence rate (IR), Hypertension (HTN)

INTRODUCTION

Surgical site infection (SSI) has always been a major complication of surgery and trauma and has been documented for 4000-5000 years. Surgical site infection is third most common infection and responsible for increasing cost, increase hospital stays, morbidity and mortality related to surgical operations [1.]

SSI was previously referred to as surgical wound infection but recently it's been defined as infection occurring within 30 days after a surgical operation (or within one year if an implant is left in place after the procedure) and affecting either the incision or deep tissue at the operation site. The infection could either be superficial or deep, incisional, or involving organs or body spaces [2,3.]

Inspite of advances in infection control, SSI remains a major limiter of surgical horizons. SSIs are a major cause of post-operative illness resulting in increased morbidity, mortality, and do have a major impact on the cost of health care. SSIs are a major cause of post-operative illness resulting in increased morbidity, mortality, and do have a major impact on the cost of health care. [4]

A surgical wound may get infected by the exogenous bacterial flora which may be present in the environmental air of an operation theatre (OT) or by the endogenous flora (5). A spectrum of microorganisms with varied antimicrobial susceptibility patterns have been identified as causative agents of SSIs, which vary with time, hospital location, and with the type of surgical procedure performed [6]

SSI can double the length of stay in the hospital and thereby increase the costs of health care which can be related to re-operation, extra nursing care and intervention and drug treatment cost. Frequency of these infections varies from patients to patients. There are numerous patient-related (endogenous) and procedure related (exogenous) risk factors that can affect a patient's risk of developing an SSI. Some of these risk factors such as age and gender cannot be changed. However, number of other factors, such as diabetes, smoking, proper use of antibiotics and intraoperative technique can be improved to reduce the chances of developing SSIs.Despite the advances made in asepsis, antimicrobial drugs, sterilization and operative techniques, surgical site infections (SSI) continue to be a major problem in all branches of surgery in the hospitals [7]

They have been responsible for the increasing cost, morbidity and mortality related to surgical operations and continues to be a major problem even in hospitals with most modern facilities and standard protocols of preoperative preparation and antibiotic prophylaxis. A major 30%-50% of antimicrobials prescribed in hospital practice are for surgical prophylaxis to prevent post-operative wound infection. A reduction in the infection rate to a minimal level could have significant benefits in terms of both patient comfort and medical resources used .[8]

This study aimed to determine the incidence of SSI in the abdominal surgeries and to identify risk factors associated with the development of SSI

METHODOLOGY

SOURCE OF DATA

The material for the present study was obtained from patient's undergone abdominal surgery in Department of General Surgery, AIMSR Bathinda, from 31 December 2015 to 31st December 2016

DAIGNOSTIC CRITERIA FOR SURGICAL SITE INFECTIONS:

- Pus discharge from the wound site
- Fever
- Increased T LC
- Pain, redness and localised swelling at wound site

Surgical site were considered to be infected according to the definition by NNIS.

The wounds were classified according to the wound contamination class system

INCLUSION CRITERIA

1. Only those patients who have undergone abdominal surgeries in AMISR Hospital BHATINDA will be included.
2. Only open abdominal surgeries included.

EXCLUSION CRITERIA

1. Patients operating outside our institution and came here only for management.

SAMPLE SIZE:

120 Patients will be included in the study that fulfils the inclusion criteria.

Method of collection of data:

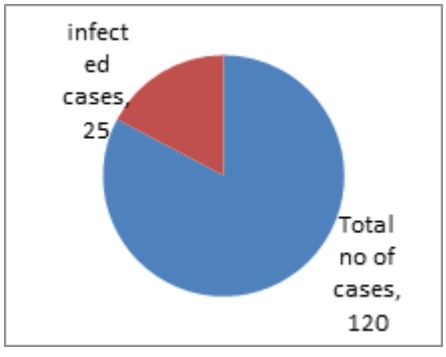
An elaborate study of these cases with regard to date of admission, history, clinical features of wound infection, type of surgery, emergency or elective, preoperative, preparation and postoperative management is done till patient is discharged from hospital, and then followed up the patient on OPD basis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

In history, presenting complaints, duration, associated diseases, coexistent infections at a remote body site, personal history including diet, smoking, and alcoholism were noted.

- Preoperative findings which include preoperative antibiotics use
- Operative findings which include no of person in operation theatre, duration of surgery.
- 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 from the wound, spontaneous opening of wound, local tenderness, and the exudates was collected from the depth of the wound using sterile cotton swab.

RESULTS

In our study included 120 General Surgical patients, out of which 25 were infected. So the incidence is 20%.



Graph No. 1: Shows Incidence of General Surgical Site Infection

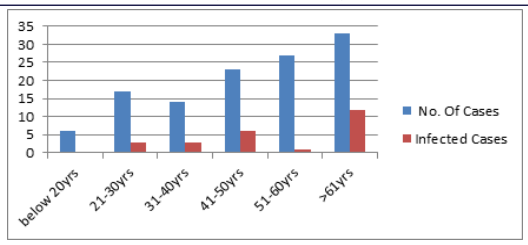
Table 1: INCIDENCE IN RELATION TO SEX

Sex	No of cases	Infected cases	Percentage
Male	89	15	16.8%
Female	31	10	32.2%

Incidence of infection among males is 16.8% whereas incidence of infection among females is 32.2%.

Table No.2: Incidence In Relation To Age Group

Age Groups	Total No. Of Cases	Infected Cases	Percentage
Below 20yrs	6	0	0
21-30yrs	17	3	17.6%
31-40yrs	14	3	21.40%
41-50yrs	23	6	26%
51-60yrs	27	1	3.7%
>61yrs	33	12	36.36%

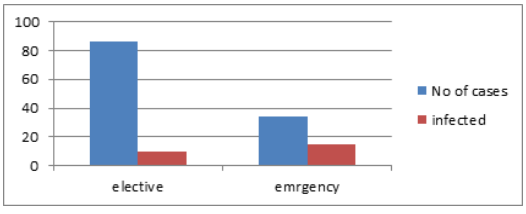


Graph No. 2: Shows Incidence In Relation To Age

Infection is more commonly seen above >60 years old patients with an incidence of 36.6% and middle age group 31-40 years which is 21.4%.

Table No. 3: Incidence In Relation To Type Of Operation

Type of surgery	No of cases	Infected	Percentage
Elective	86	10	11.6%
Emergency	34	15	44.11%

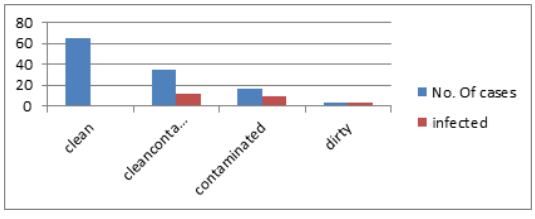


Graph No. 3: Incidence of General Surgical Site Infection by EL and EM

Incidence of infection among Emergency surgeries is 44.11% whereas among Elective surgeries is 11.6%.

Table No. 4: Incidence In Relation To Type Of Surgical Wound

Type	No. Of Cases	Infected	Percentage
Clean	65	0	0
Clean contaminated	35	12	34.28%
Contaminated	17	10	58.82%
Dirty	3	3	100%

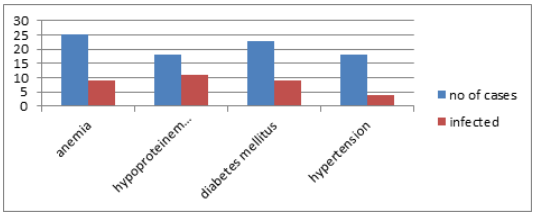


Graph No. 4 Shows Incidence In Relation To Type Surgical Wound

Out of 120 cases 65 were clean cases, 35 were clean-contaminated 17 were contaminated and 3 were infected cases. Out of which clean cases didn't had any infection, clean-contaminated had incidence of 34.2 % contaminated cases had 58.82% and in infected cases incidence was 100%. Infection was more in contaminated cases and infected cases.

Table No. 5: Incidence In Relation To Anaemia, Hypoproteinemia, Diabetes and Hypertension

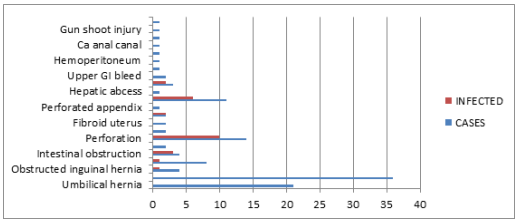
Risk factor	No of cases	Infected	Percentage
Anemia	25	9	36%
Hypoproteinemia	18	11	25%
Diabetes mellitus	23	9	39%
Hypertension	18	4	22%



Graph No. 5 Shows Incidence In Relation To Risk Factors

Most of the patients were anaemic and diabetics with infection rate of 36% and 39% respectively. Hypoproteinemia patients had infection rate of 25%, and Hypertensive patients had infection rate of 22%.

Incidence In Relation To Diagnosis

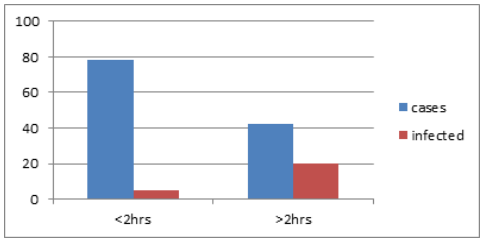


Graph No.6: Shows Incidence In Relation To Diagnosis

Umbilical hernia and inguinal hernia were the most common operations performed. Surgical site infection was more among perforations, hepatic abscess, chronic cholecystitis, obstruction and appendicitis.

Table No. 6: Incidence In Relation To Duration Of Surgery In Hours

Duration Of Surgery	No. Of Cases	Infected Cases	Percentage
<2hrs	78	5	6.4%
>2hrs	42	20	47.6%

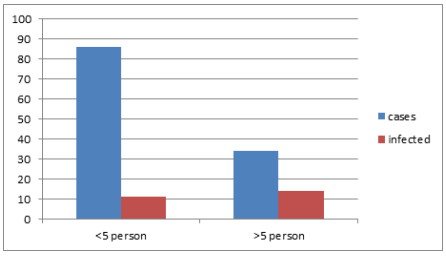


Graph No.7: Shows Incidence In Relation To Duration of Surgery in Hours

78 cases had operation time <2 hours with incidence of infection 6.4%, 42 of cases had operation time of >2 hours with an incidence of infection 47.6%. Incidence was more in surgeries having duration of >2 hours.

Table 7: Incidence related to number of person in Operation Theatre

No of person	Cases	Infected	Percentage
<5 Person	86	11	12%
>5person	34	14	41%

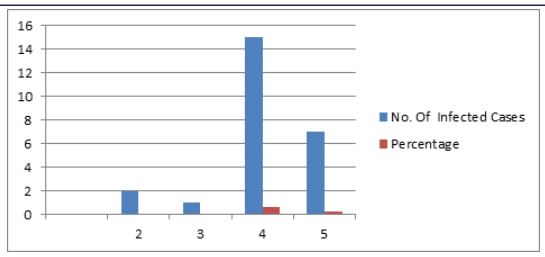


Graph No.8: Shows Incidence in Relation number of person in operation theatre.

In 86 patient incidence rate was 12% in which no of person <5 person, as the number of person increases the rate of incidence also increases to 41%.

Table No. 8: Incidence Of Infection Noted On Post-operative Day

Day	No. Of Infected Cases	Percentage
2	2	8%
3	1	4%
4	15	60%
5	7	28%

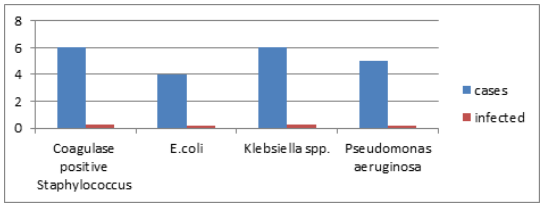


Graph No. 9: Show Incidence of Infection Noted On Post-operative Day

2 and 1 cases had infection detected on 2rd and 3th post-operative day respectively, followed by 15 and 7 cases each had infection detected on 4th and 5th post-operative day respectively.

Table No. 9 Incidence of Organism Isolated

Type Of Organism	No. Of Cases	Percentage
Coagulase positive Staphylococcus	6	24%
E.coli	4	16%
Klebsiella spp.	6	24%
Pseudomonas aeruginosa	5	20%
Acinetobactor	4	16%



Graph No. 10: Incidence of Organism Detected In Surgical Site Infection Cases

Out of 25 infected cases 6 cases had Klebsiella infection, 4 cases had E. coli and 5 cases had Pseudomonas aeruginosa, 6 case had coagulase positive Staphylococcus, and 4 cases had acinetobactor infection. Klebsiella and Staphylococcus were the most common isolated organisms.

CONCLUSION

1. Incidence of Surgical Site Infection at AIMSR Bathinda is 20%.
2. Incidence of infection among males is 16.8%, which is more than in females i.e. 32.2%.
3. SSI rate is maximum in patients of age >60 years which is 36.36%.
4. Out of 120 cases, 86 were elective and 34 were emergency surgeries. Elective cases had an incidence of 11.6% and emergency cases had more incidences of 44.11%.
5. Out of 120 patients, 25 were anaemic, who had incidence of 36% of infection rate; 18 had Hypoproteinemia, who had 25% of infection rate; 23 were diabetic, who had 39% of infection rate and 18 were hypertensive, who had 22.2% of infection rate.
6. Umbilical hernia and inguinal hernia were the most common operations performed.
7. Surgical site infection was more among perforations, hepatic abscess, chronic cholecystitis, and appendicitis.
8. Clean cases were 65 and no infection was seen among them, clean-contaminated cases were 35 and had an infection rate of 34.28%; contaminated cases were 17 and had an infection rate of 58.82% and infected cases were 3 and had an infection rate 100%.
9. Longer the duration of surgery more was the infection rate.
10. More the number of people in operation theatre more the rate of infection.
11. Most of the cases had Surgical Site Infection detected on4th and 5th post-operative day.
12. Gram –ve bacilli were the more common isolate detected and *Klebsiella spp*. was the most common isolated organism in this study.

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