



Surgical Site Infection in Abdominal Surgeries in a Tertiary Centre

KEYWORDS

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INTRODUCTION-

Surgical site infection is a major post operative complication in all branches of surgery in the hospital. Surgical site infection concerns 2 million cases annually worldwide (1) This post operative infection is known to be one of the most common causes of nosocomial infections (2) (3). WHO describes hospital acquired infection to be one of the major infection diseases having a huge economic impact worldwide(4). Surgical site infection is categorized under a broad term, 'Nosocomial infections'. Emergency procedures, wound class, wound contamination, extremes of age, metabolic disease, immunosuppressant, malnutrition, remote site infection, duration of pre operative and post-operative hospital stay, pre existing illness, length of surgical operation are some important factors which influence the incidence of surgical site infections (5,6,7). The problem of SSI continues to be a problem even after maintaining the standard protocol of pre-operative preparations and antibiotic prophylaxis. This study was done to determine the incidence and associated risk factors of surgical site infection in abdominal surgeries in tertiary care teaching hospital of Bihar

MATERIALS AND METHOD-

This was a prospective study carried out in the dept. of Surgery, J.L.N.M.C.H., Bhagalpur, Bihar in the year 2015. 750 Abdominal surgeries were performed from January 2015 to December 2015. Study of risk factors and other relevant information were collected including age, sex, history of diabetes, obesity, duration of pre operative hospital stay, type of operation, ASA score, type of anesthesia, duration of surgery, wound class, Hemoglobin percentage, antimicrobial prophylaxis. Wound class was considered as clean, clean contaminated and dirty as per National Research council classification criteria.

Wound infection was diagnosed if any one of these criteria were fulfilled : Serous or Non purulent discharge from the wound, pus discharge from the wound serous or non purulent discharge from the wound with sign of inflammation and when wound was deliberately opened by the surgeon due to localised collection. Stitch abscess was excluded from the study.

Prophylactic antimicrobial administration was given in each case. Percentage of relevant data's were calculated and studied.

RESULTS-

Out of 750 patients who were operated abdominally 165 (22%) patients developed surgical site infections – A Total of ten types of abdominal procedures were performed, out of which cholecystectomy appendectomy, herniorrhaphy

and laparotomy for perforation and obstruction accounted for 70% of the total surgical procedures. 400 patients had elective surgeries and 350 patients had undergone emergency operations. In Emergency operation the surgical site infection rate was higher. Out of 350 patients 98(28%) had surgical site infection. In routine operations, out of 400 patients, 80(20%) had surgical site infections.

Out of 340 female patients 60(17.6%) developed SSI, while in male group out of 410, 105 patients (25.6%) had surgical site infections. This showed that male were more prone to post operative wound infections. Regarding age group patients more than 50 years were more prone to wound infections (36%)

There was a clearcut relation between SSI rate and the wound class. The SSI rate was 15.2% in clean wound, 19.3% in clean contaminated 25.5% in contaminated and 79.2% in dirty wounds (Table-1)

(Table – 1)
SSI rate according to the wound class

Wound Class	Total patients	Infections	SSI rate (%)
Clean	438	67	15.2%
Clean Contaminated	165	32	19.3%
Contaminated	94	24	25.5%
Dirty	53	42	79.2%

Duration of pre operative hospital stay also influenced the rate of SSI. The rate of infection was lowest (10.1%) when the duration of stay was <2days and it was highest (41.8%) when the duration was more than 10days (Table-2)

Table-2
SSI rate according to Pre-operative hospital stay

Pre-operative hospital stay (days)	No. of Patients	No. of SSI Patients	SSI rate
0-1	168	17	10.1%
2-5	209	38	18.1%
6-10	275	69	25%
> 10	98	41	41.8%

Rate of infection was more in diabetic patients. 150 patients were diabetic and rate of SSI was 26% (39/150) in comparison to 21% in non diabetics (126/600) Anaemic patients were also more prone to infection It was 23% with Hb%<9.0gm/dl in comparison to 21% in patients with >9.0 gm/dl.

DISCUSSION

In the present study the rate of infection was 22% (165/750). The surgical site infection rate differs from hospital to hospital, depending upon the circumstances like type of operations, standard of hygiene and sterilization and conditions of patients. In study by V. staynarayana (10) the incidence was 13.7% while study by Anand saxena (6) it was 14.33%. The infection rate is lower in USA (2.8%) and 2-5% in European countries (12). But some African countries like Northern Ghana has higher SSI rate 39% (13). Stephan Apanga et al.

In our study the incidence was higher 25.6% (105/400) in male in comparison to 17.6% in female (60/340) study by Anand saxena (6) showed a similar trend, 14.5% in male and 13.4% in female. The study showed that males were more prone to SSI.

The wound class had a definite co-orelation with the incidence of SSI. In our study infection rate in clean wound was 15.2%, in clean contaminated it was 19.3%, in contaminated it was 25.5% and in dirty wound it was 79.2%. Study by Anand saxena et al (6) and others (10,11) had also a direct correlation between the wound class and the incidence of SSI.

Sachin Patel (11) had 40% incidence in dirty wound and 3% in clean wound, while V Satyanarayn (10) had 56.7%, SSI incidence of Dirty wound and 3.9% in clean wound. A relatively higher standard of set up in their hospital in comparison to ours might be a cause behind lower incidence of SSI in their institution.

Age group of above 50 yrs had higher incidence of SSI 36% study by others(11) also showed similar trend. Reduced immunity and other co-morbidities, malabsrbtion, increased catabolic processes might be the cause behind this(6).

The infection rate was higher in patients undergoing emergency surgeries than in elective surgeries. In our case, SSI was 20% in our study and 28% in emergency surgery.

The high rates of infection in Emergency surgery was also seen in other's study (6, 10, 11). This high rate of SSI in Emergency surgery may be a result of inadequate pre-operative preparation the condition which predisposed to patients to the emergency surgery and more chances of contaminated or dirty wounds in emergency surgeries.

In our study the SSI rate was higher in patients with longer pre operative hospital stay, 10.1% (17/168) with <2days stay and 41/98(41.8%) with >10days stay, similar reports have been found by other (6, 11). The rate of infection was more the patients having longer pre operative stay in hospital ward (6).

Long preoperative hospital stay causes colonization with antimicrobial resistant micro organism and affects patients susceptibility to infections by lowering host resistance and providing increased opportunity for ultimate bacterial colonization.

CONCLUSION-

Surgical site infection is a major complication of surgeries. It is one of the important cause of post operative morbidity and mortality. The rate of infection is a reflection of patient care and standard of treatment in any hospital. An effect to reduce the rate of SSI should be our aim and for

this proper surveillance regarding wound infection and its causative factors should be studied regularly and effective steps should be taken to reduce the rate of SSI.

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