

Original Article

A Study on Factors Affecting Post Operative Wound Infection

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Abstract

Background: Post-operative wound infection is an infection in the tissues of the incision and operative area. Surgical Site Infections (SSIs) have been responsible for the increasing cost, morbidity and mortality related to surgical operations and continue to be a major problem even in hospitals with most modern facilities and standard protocols of preoperative preparation and antibiotic prophylaxis. **Aim:** To study factors associated with post operative wound infections. **Materials and Methods:** 100 cases of post operative wound infections with different age group from several wards of Rajindra hospital, Patiala were studied. Detailed history from the patient including the risk factors associated with the wound was taken after obtaining informed written consent of the patient. **Results:** Out of the total of 100 cases, only 27 developed wound infection postoperatively giving an infection rate of 27%. The infection rate was maximum in the age group of 60-69 years i.e.60% and minimum in the age group of 20-29 years i.e.22.7%. The percentage of wound infection increased with the duration of operation. It was found that the infection rate was slightly higher in emergency surgeries (34.8%) as compared to elective ones (11.8%) with highest rate in case of abdominal laparotomy cases (39.3%) followed by appendicectomy and was more in drained wounds (34.3%) as compared to non drained ones(15.2%). **Conclusion:** The advances in the operative techniques and a better understanding on the pathogenesis of the wound infections, post-operative wound infections are still a major source of morbidity and mortality for the patients who undergo operative procedures.

Key Words: Post-operative Wound infections; Surgical Site Infections

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INTRODUCTION

A wound is the disruption in the continuity of soft parts of the body structure.¹ Post operative wound infection is an infection in the tissues of the incision and operative area which can occur from 1 day to many years after an operation.² Surgical site infections (SSIs) are the third most commonly reported nosocomial infections and account for approximately a quarter of all hospital acquired

infections.³ Factors which increase an individual's risk to post operative wound infections include malnutrition, lengthy preoperative stay, diabetes, use of steroids and poor skin preparation. Additionally, conditions surrounding the surgery may account for added risk like length of surgery, wound site contamination, infection among the surgical staff and instrument contamination.² Thus, present study was undertaken to assess the various

risk factors responsible for post operative wound infection.

MATERIAL AND METHODS

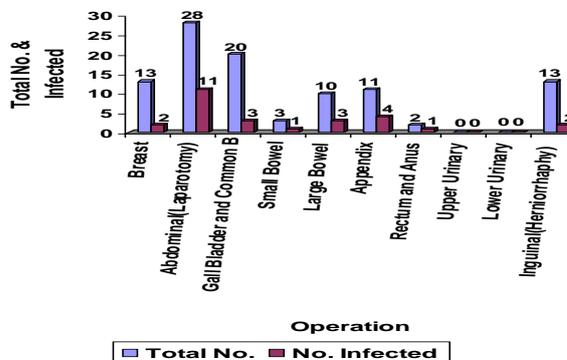
100 cases of post operative wound infections with different age group from several wards of Rajindra hospital, Patiala were studied after obtaining ethical clearance from the ethical committee of the institute. Detailed history from the patient including the risk factors associated with the wound was taken after obtaining informed written consent of the patient. The pus samples taken from the site of the wound were then processed in the Microbiology Department of Government Medical College, Patiala. The results were then statistically analyzed using the chi square test and p value <0.05 was considered as significant value.

RESULT

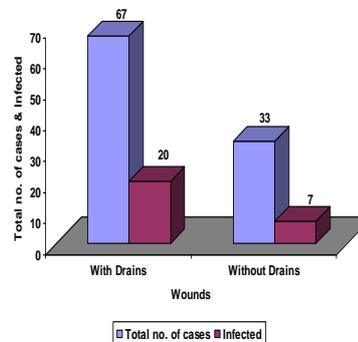
Out of the total of 100 cases, only 27 developed wound infection postoperatively giving an infection rate of 27%. The infection rate was maximum in the age group of 60-69 years i.e. 60% and minimum in the age group of 20-29 years i.e.22.7%.It was observed that the incidence of wound infection rises consistently as the age advances (table 1).The percentage of wound infection increased with the duration of operation. The maximum percentage was found in cases in which duration of operation was ≥150 minutes (50%) and minimum when the duration was 60-85 minutes(10%) (table 2). Infection rate was slightly higher in emergency surgeries (34.8%) as compared to elective ones (11.8%) (table 3) with statistically significant results(p<0.05). The infection rate was highest in the abdominal laparotomy cases (39.3%) followed by appendicectomy (36.3%) (graph 1).

Table 1: Incidence of wound infection in relation to age

Age group(years)	No. of cases	Infected	Percentage (%)
10-19	10	3	30
20-29	22	5	22.7
30-39	21	5	23.8
40-49	27	7	25.9
50-59	15	4	26.6
60-69	5	3	60
Total	100	27	27



Graph 1: Infection Rate in Various Surgeries



Graph 2: Drainage and Infection Rate

Table 2:Duration of operation and infection rate

Duration in Minutes	Total No.	No. Infected	Percentage (%)
≤ 55	14	2	14.2
60-85	30	3	10
90-115	22	6	27.2
120-145	14	6	42.8
≥ 150	20	10	50

Table 3:Infection rate in elective and emergency surgeries

Type of surgery	Total No.	No. Infected	Percentage (%)
Emergency	66	23	34.8
Elective	34	4	11.8
Chi Square = 6.067 at df = 1; p = 0.0138, hence significant			

Infection rate was more in drained wounds (34.3%) as compared to those without drains(15.2%) with statistically significant p value (p<0.05) (graph 2).

DISCUSSION

SSIs is a dangerous condition, a heavy burden on the patient as such infections lengthens bed stay for an average of seven days. Probable sources of infection are the hospital environment, other patients, staff, infected surgical instruments, dressings, and even drugs and injections. The present study found surgical site infection rate of 27% with rise in increase in incidence of wound infection consistently as the age advances. However, the rate varies in different countries, different areas and even in different hospitals.⁵Razavi SM et al⁴ reported rate 17.4%, Ahmed et al⁶ reported 9.81%, Jamulirat S et al⁷ reported 6.5% rate, Bandaru NR et al⁵ reported 9.8% where as Damani NN et al⁸ described a 30% incidence of hospital-acquired infections. The present study found that percentage of wound infection increased with the duration of operation. The results are in consistent with study carried by Chowdhury MAM et al⁹ who

reported that infection rates were 5.3%, 10.5%, 26.1% for durations <60 minutes, 60-120 minutes, >120 minutes respectively. The association between the two may be the result of more complicated operations being of longer duration and increased damage to the tissue due to long exposure of the wound. Infection rate was slightly higher in emergency surgeries as compared to elective ones. Similar results were found by Anvikar et al¹⁰ who reported that 4.66% of patients developed post operative wound infection after emergency surgery and 3.74% after elective surgery. Similarly Razavi SM et al⁴ found that the risk of SSI is less in elective surgeries than those referred to emergency departments as cases of acute abdomen, which could result from lack of readiness for operation on the patient's side. Thus, it is necessary to reduce risk factors by preparing the patient for the urgent operation as much as possible. In the present study, infection rate was found to be highest in the abdominal laparotomy cases followed by appendectomy. This may be due to

the exposure of the whole abdominal cavity resulting in increased contamination of the wound from airborne bacteria in the operation room and moreover being of longer duration, there are increased chances of tissue damage. The incidence of SSIs with regard to abdominal surgical sites and operating conditions for clean wounds (1.5–3.7%); clean-contaminated wounds (3–4%); contaminated wounds (8.5%); dirty-infected wounds (28–40%); in laparoscopy (10%) umbilical hernia (2–5%); in the cancer of the colon without taking antimicrobial drugs (30–60%); or with antibiotic and proper intestine wash (10%); in colostomy (above 50%); in colon perforation (20%); in stomach cancer and surgery (20%); in hernionite (50%); in adult appendectomy (10–20%); in children's appendicitis (2–5%); in aged appendicitis and in pregnant women (10–50%); and in AIDS victims (above 50%); in liver abscess (20%); in hydatid cyst (2–5%); in acute and chronic cholecystectomy without stones (10%); in acute septic cholangitis (10–20%); in laparoscopic cholecystectomy (2–5%); and in splenectomy (2–5%).¹¹ A statistically significant association was found between the infection rate in case of drained wounds. The results are consistent with the other studies.¹² The drain itself acts as a pathway for the entry of microbes, thereby reducing the infectious dose. As, once a patient's major defence against infection, the intact skin, is breached by either trauma or surgical knife, a broad avenue is opened to introduction of virulent bacteria.¹³ Studies on surgical site infection should be carried out to establish data which will be of clinical relevance in guiding policies for prophylaxis and therapeutic purposes.

CONCLUSION

In spite of the advances in the operative techniques and a better understanding on the pathogenesis of the wound infections, post-operative wound infections are still a major source of morbidity and mortality for the patients who undergo operative procedures. Thus, the incidence of post operative wound infection should be minimized by taking into consideration the hygiene of the patient and the disinfection of the hospital environment including the wards and the operation theatre.

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