

Section

General Surgery

Original

Article

# Prevalence of Surgical Site Infections in IPD Department of Surgery: A Hospital Based Study

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## ABSTRACT

**Background:** The most common causes of nosocomial infections are surgical site infections (SSIs). It is also reported that SSIs rate ranges from 2.5% to 41.9% worldwide and resulting in high morbidity and mortality.

**Methods:** This study conducted in Department of Surgery, Ananta Institute of Medical Sciences and Research Centre, Rajsamand.

**Results:** In this study, 410 cases were included, out of which 5.6% were infected post-surgery and 94.3% were non-infected. From the 5.6% cases 60.9% had mild infection and 30.4% had moderate infection and 8.7% had severe infection.

**Conclusions:** In the present study, the infection rate was higher. This high infection rate was due to the contaminated and dirty procedures where some of the patients were first seen about 2 to 3 days after development of peritonitis. It has been noted that the infection rate was higher in the emergency operative procedures in comparison to the elective procedures.

**Keywords:** Infection, wound, emergency, contaminated, moderate

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## INTRODUCTION

World Health Organization (WHO) reported that hospital acquired infections are one of the major infectious diseases which are having a critical economic impact worldwide.<sup>[1]</sup> These infections affect around two million people annually all over the world.<sup>[2,3]</sup>

The most common causes of nosocomial infections are surgical site infections (SSIs). It is also reported that SSIs rate ranges from 2.5% to 41.9% worldwide and resulting in high morbidity and mortality.<sup>[4-5]</sup> Every year approximately 2% to 5% of the 16 million people develop surgical site infections while undergoing surgical procedures.<sup>[6-7]</sup> It may causes death and an economic burden on the patients due to prolonged post-operative stay in the hospitals. In developing countries, the situation is worse due to the

scarcity of resources and lack of trained staff. The essential component of total quality management is to control the post-operative complications. Therefore, it is important to determine the prevalence of surgical site infections, assess the magnitude of the problem and provide a rationale to set priorities in infection control in the hospitals. In India, very few researches have been done in this direction.

Therefore, the present study had been undertaken with the following aims and objectives-

- To isolate the different organisms from post-operative wound infections.
- To determine the antibiotic sensitivity pattern of these isolates, and
- To determine the rate of SSI.

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## METHODS

**Study Area:-**This study conducted in Department of Surgery, Ananta Institute of Medical Sciences and Research Centre, Rajsamand

**Study Population:-** Total 410 cases included in this study each of from surgery department.

**Sample Collection:-** In this study, for all cases was followed standard surgical protocol. A single dose preoperative antibiotic prophylaxis using, Ampicillin was given to all the patients at the time of induction of anesthesia. Postoperatively Ampicillin and Gentamycin were given for most of the cases till the time of suture removal.

All the 410 wounds were inspected for evidence of wound infection such as erythema beyond 5 mm of incision, wound is charge and gaping of the wound on the 3rd post-operative day, at the time of suture removal and after one month at follow up. Vital charting was done, during the patients stay in the hospital. Post-operative fever was correlated with the wound findings as it could be due to reasons other than wound infection. Any discharge from the wound was sent for bacteriological evaluation, culture and sensitivity.

**Data analysis:-** Data were analyzed by the using Microsoft excel.

## RESULTS

In this study, 410 cases were included, out of which 5.6% were infected post-surgery and 94.3% were non-infected. From the 5.6% cases 60.9% had mild infection and 30.4% had moderate infection and 8.7 had severe infection. The nature of the surgery in this study 70.7% clean followed by clean-contaminated (18.6%), Contaminated & dirty (16.1%). In the present study, 51.7% cases found who had 10-13gms hemoglobin followed by 30.4% <10gms & 17.8% >13gms respectively.

**Table-1: Grading of wound infection**

Grade	Description	Signs and Symptoms
Grade 1	Stich abscess	Redness, Pustules
Grade 2	Mild infection	Slightly sero-purulent or purulent discharge
Grade 3	Moderate infection	Frank infection, purulent discharge
Grade 4	Severe infection	Frank infection, abscess formation

**Table-2 Infected & Non-infected cases**

Cases	Number of cases	Percentage
Non infected	23	5.6%
	387	94.3%
	410	100%

**Table-3 distribution of cases according to types of infection**

Type of infection	Number of cases	Percentage
Mild	14	60.9%
Moderate	7	30.4%
Severe	2	8.7%
Total	23	100%

**Table-4 Distribution of infected & non-infected cases according to nature of surgery**

Nature of surgery	Infected	Non-infected	Total
Clean	4 (17.3%)	286(73.9%)	290(70.7%)
Clean-Contaminated	2(8.6%)	75(19.3%)	77(18.7%)
Contaminated & Dirty	17(73.9%)	49(12.6%)	66(16.1%)
Total	23(5.6%)	387(94.3%)	410(100%)

**Table-5 Distribution of infected & non-infected cases according to hemoglobin**

Hemoglobin	Infected	Non-infected	Total
>13gms	3 (13.1%)	70(18.1%)	73(17.8%)
10-13gms	7(30.4%)	205(52.9%)	212(51.7%)
<10gms	13(56.5%)	112(28.9%)	125(30.4%)
Total	23(5.6%)	387(94.3%)	410(100%)

**Table-6 Distribution of infected & non-infected cases according to Diabetes mellitus**

Diabetes mellitus	Infected	Non-infected	Total
Diabetic cases	4(17.3%)	72(18.6%)	76(18.5%)
Non-diabetic cases	19(82.6%)	315(81.3%)	334(81.4%)
Total	23(5.6%)	387(94.3%)	410(100%)

**Table-7 Distribution of infected & non-infected cases according to Drains**

Drains	Infected cases	Non infected	Total
Used	16(69.5%)	216(55.8%)	232(56.5%)
Not used	7(30.4%)	171(44.1%)	178(43.4%)
Total	23(5.6%)	387(94.3%)	410(100%)

## DISCUSSION

There are various causes of post-operative wound infection. Basically, this infection is determined by the interaction of several factors such as the nature and degree of Contamination of the wound, local tissue factors and the general Instance of the patient probably modified. Some factors are considered in this study. The present study consists of 23 cases out of 410 cases with post-operative wound infection in elective surgeries accounting to 9.87%. Another studies reveals in their study that with a wound infection rate of 5.6%, 554 patients were operated as emergency surgery and 872 patients were operated as elective surgery with wound infection rate of 2.9%. Thus, this study supports the present study which shows post-operative wound infection rate more in emergency surgeries. The percentage of wound infection rates for clean contaminated, clean and dirty wounds is 18.7%, 70.7%, and 16.1% respectively in the present study. Similar findings were found in the study of Cruse, Foord and Agarwal and et al. shows the relation between anemia and incidence of wound infection.<sup>[8,9]</sup> Through hypoxia and by deranged tissue perfusion, anemia increases the infection rate. Infection rate in patients with Hemoglobin above 13gms, hemoglobin between 10 and 13 gms and with less than 10 gms was 17.8%, 51.7% and 30.4% respectively. These results are

statistically significant and indicating a strong association between anemia and post-operative wound infection. Pre-operative hospitalization has a significant effect on the post-operative wound infection. The normal bacterial flora of the patient is usually replaced by the resistant hospital flora as the duration of preoperative hospitalization increases.

In this study though the infection rate was higher when the pre-operative hospitalization was more than one week in comparison to less than one week. Though, the results are not statistically significant. Similar findings were found in the another study.<sup>[8,10]</sup>

In comparison to males (13.14%), females (15.28%) had higher infection rate but it was statistically insignificant. The small sample size of females can be held responsible for this insignificance. Infection rates were also found to be higher in cases with pre-operative hospitalization over 1 week and in cases over 60 years of age. These higher infections rates were again non-significant.

## CONCLUSION

The present study suggested the effect of nature, duration and urgency of surgery along with diabetes, anemia and use of the drain as strong indicators of infection. The present study presented the changing outline of wound infection towards mixed infections.

If we get a chance, we would like to this study again with greater number of patients to get the better results and to validate our findings of the present study.

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