

# Clinical profile of wound infection in postoperative patients in the department of general surgery

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## Abstract

**Background:** The evolution of scientific knowledge in microbiological field has provided an opportunity to explore new methods of therapy, which have changed and improved surgical practice remarkably during 20<sup>th</sup> century. Surgical infection, particularly surgical site infection (SSI), has always been a major complication of surgery and trauma and has been documented for 4000-5000 years. **Cases:** 800 patients have been studied in this study. Department of microbiology helped us in conducting this study. Every Patient who underwent clean and clean contaminated surgery was studied.

**Keywords:** wound infection, clinical profile.

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## INTRODUCTION

Surgery has made great advances in 20th century but postoperative wound infection still remains the significant problem faced by the surgeons since the advent of surgery. The principles of antiseptics by Joseph Lister and Pasteur's germ cell theory in the 19th century have led to a better understanding in the etiopathogenesis of post operative wound infection. Despite improvement in operating room practices, instrument sterilisation methods and better surgical techniques, postoperative site infections remain a major cause of postoperative morbidity and delay in discharge from the hospital. Surgical wound infections are the second most frequent nosocomial infection in most hospitals and are an important cause of morbidity, mortality, excess hospital cost.<sup>1-4</sup> Exogenous surgical site infection pathogens are occasionally responsible and includes staphylococci and streptococci. These organisms mostly come from members of surgical team (e.g. hands, nose, other body

parts), contaminated surfaces in the operating room, even the air and contaminated instruments, surgical gloves or other items used in surgery<sup>5</sup>. During epidemic periods, exogenous contamination may be responsible for many more infections.<sup>6,7</sup>

## CASE REPORT

Study of 800 patients of postoperative infections in our department of surgery are as follows

## OBSERVATIONS AND RESULTS

**Table 1:** Postoperative wound infection incidence

Total no. of cases operated	No. of infected cases	Incidence
800	28	3.5%

Post operative wound infection rate in our study is 3.5%

**Table 2:** Postoperative wound infection incidence according to type of wound

Wound	Total no. of cases operated	No. of infected cases	Incidence
Clean	583	17	2.91%
Clean and Contaminated	217	11	5.07%

This table shows that maximum infective occurred in clean contaminated type i.e. 5.07%

**Table 3:** Postoperative wound infection incidence according to type of surgery

Type	Emergency surgery	Elective surgery
Clean	No surgery was done	17/583= 2.91
Clean Contaminated	8/112 = 7.14	3/105= 2.86

This table shows that maximum infection were found in emergency clean contaminated surgeries i.e. 7.14%

**Table 4:** Postoperative wound infection percentage as per definition in clean and clean contaminated surgeries

Type	No. of infected cases	Percentage
Superficial Incisional SSI	20	71.43
Deep Incisional SSI	8	28.57
Organ/Space SSI	0	0
<b>Total</b>	<b>28</b>	<b>100</b>

This table shows that maximum infection were of superficial incisional SSI type i.e. 71.43%

**Table 5:** Age distribution

Age (years)	Total no. of operated patients	No. of infected cases	Percentage
0-10	96	02	00.21
11-20	60	00	00
21-30	74	02	00.28
31-40	109	01	00.92
41-50	168	03	1.78
51-60	185	12	6.49
61-70	108	08	7.41
<b>Total</b>	<b>800</b>	<b>28</b>	<b>3.5</b>

The above table shows that maximum patients of wound infection were from age group of 61 – 70 yrs. (7.41%) followed by 51 – 60 yrs. (6.49%). Thus maximum rate of infection is observed in 6<sup>th</sup> and 7<sup>th</sup> decade of life.

**Table 6:** Sex distribution

Sex	Total No. of operated cases	No. of infected cases	Percentage
Male	551	16	2.90
Female	249	12	4.81
<b>Total</b>	<b>800</b>	<b>28</b>	<b>3.5</b>

This table shows slightly higher rate of infection in females than males i.e. 4.81%

**Table 7:** Isolated microorganisms from infected wound

Organisms	No. of Isolates	Percentage
Staphylococcus auerus	20	36.36
Coagulase negative staphylococci	5	9.09
Pseudomonas	12	21.82
E.coli	7	12.74
Klebsiella	4	7.27
Proteus	2	3.63
Citrobacter	5	9.09
<b>Total</b>	<b>55</b>	<b>100</b>

**Table 12:** Organism sensitivity to antibiotics

Organism isolated	No. Of isolates	Tetracycline	Erythromycin	Ampicillin	Gentamycin	Amikacin	Cefotaxim	Imipenam	Vancomycin
S.Aureus	20	-	-	6	2	14	9	12	8
Cons	5	-	-	-	-	2	1	-	-
Pseudomonas	12	1	-	-	-	4	1	2	4
E-coli	7	-	-	-	1	5	3	-	-
Klebsiella	4	-	-	-	-	1	2	-	-
Proteus	2	-	-	-	-	-	-	-	-
B-hemolytic Streptococci	1	-	1	1	-	-	-	-	-
Citrobacter	5	-	-	-	-	3	2	-	-

This table shows that staphylococcus aureus (36.36%) and pseudomonas (21.82%) are the commonest organisms isolated from samples.

**Table 8:** Types of bacteria

Types of bacteria	No. of isolates	Percentage
Gram positive	25	45.45
Gram negative	30	54.55
<b>Total</b>	<b>55</b>	<b>100</b>

This table shows that maximum of isolates were gram negative i.e. 54.55%

**Table 9:** Hemoglobin level

Hemoglobin level	Total No. patients	No. of infected cases	Percentage
8-8.9	32	15	46.87
9-9.9	47	5	10.67
10-10.9	77	6	7.80
11-11.9	296	2	0.66
12-12.9	175	00	00
13-13.9	144	00	00
14-14.9	19	00	00
15-15.9	10	00	00

This table shows that patients with good hemoglobin status are having less postoperative wound infection rate.

**Table 10:** Infection rate in pre-existing diseases in infected cases association of pre existing diseases and without pre existing diseases with the infected cases

	Patient with pre existing diseases	Patient without pre existing diseases
Infected cases	13	15
Total no. of operated cases	208	592
Rate	6.25	2.53

This Shows that patient with pre existing diseases have higher infection rate.

**Table 11:** Serum protein levels in infected patients

Total serum protein level	< 4.0 gm %	4.0-5.0 gm %	5.0-6.0 gm %	Total
Clean	0	15	2	17
Clean contaminated	7	3	1	11
No. of patients	7	18	3	28

This table shows that serum protein levels in infected patient is below the normal level.

1. In 28 patients most common organism isolated was staphylococcus aureus i.e. 20 cases, pseudomonas i.e. 12 cases, followed by E-coli i.e. 7 cases.
2. Mixed infection was common i.e. S. Aureus and Pseudomonas.



**Figure 1:** A photograph showing deep incisional ssi (infected wound of appendicectomy)

3. In this study S. Aureus was most sensitive to amikacin, imipenam, followed by cefotaxime.
4. Pseudomonas was most sensitive to amikacin and vancomycin equally.
5. E-coli was most sensitive to amikacin followed by cefotaxime.



**Figure 2:** A photograph showing superficial incisional ssi (infected wound of stoppa's repair)

## DISCUSSION

In the present study, out of 800 cases of various age and sex who have undergone various surgical procedures, 28 subsequently developed postoperative wound infection. The duration of study was from Dec. 2009 to Oct. 2013. In this study postoperative wound infection rate was 3.5% i.e. 28 cases out of 800 operated cases. Our infection rate is comparable with the infection rate of various studies. The postoperative wound infection rate as reported by various studies varies from 1.25% to 13.7%.

Out of these 28 cases of postoperative wound infections –

- Superficial Incisional SSI was observed in 20 patients i.e. 71.43%
- Deep Incisional SSI was encountered in 8 cases i.e. 28.57%.

Extreme of age have long been thought to influence the likelihood of wound infections perhaps owing to decreased immunocompetence. Thus it was quite obvious from our study results that age of the patient does contribute to some extent in postoperative wound infection. Also, many workers like Cruse PJE and Foord R<sup>8,9</sup> (1973) and Kowli *et al*<sup>10</sup> (1985) Iiaz A, Amer S<sup>11</sup> (2010) from their study showed the similar results.

## SUMMARY AND CONCLUSIONS

From the study of postoperative wound infection carried out in our hospital over a period of 4 years following conclusions are drawn.

1. Total 800 cases operated over a period of four years were studied. 28 of them developed postoperative wound infections and incidence in our study was 3.5%.
2. Amongst 28 infected cases, 17 i.e. 2.91% were clean type of wounds followed by 13 i.e. 5.07%

clean contaminated wounds respectively, suggesting maximum postoperative wound infections occurred in clean contaminated type of wounds.

3. Postoperative wound infection was maximum in
  - 6<sup>th</sup> and 7<sup>th</sup> decade of life in our study.
  - Patients with hemoglobin < 10 gm%
  - Patients with serum protiens < 5 gm%
  - Patients with underlying systemic illness like diabetes mellitus, tuberculosis, Urinary tract infection, Upper respiratory tract infection.
4. Staphylococcus aureus, Pseudomonas were the commonest organisms isolated.
5. Postoperative antibiotics have a definite role in prevention of postoperative wound infections.
6. Cefotaxime and amikacin can be recommended as prophylatic antibiotics of choice for our departmental patients undergoing clean and clean contaminated surgeries in our institute.

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