



STUDY OF SURGICAL SITE INFECTION IN SURGICAL WARDS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Surgical site infections (SSIs) are one of the most common hospital-acquired infections, second only to urinary tract infections. This prospective study was conducted in KIMS and RF to determine the incidence of SSI in abdominal surgeries, identify the causative organisms, assess risk factors, and evaluate antibiotic sensitivity. **Methods:** A total of 458 patients who underwent abdominal surgeries (excluding clean surgeries) between April 2023 and April 2025 were prospectively studied. Parameters such as nature and type of surgery, wound classification, duration, and predisposing factors were correlated with incidence and bacteriology of SSI. **Results:** SSI occurred in 33 patients (7.2%), with a higher incidence in emergency surgeries (11.9%) versus elective (3.2%). Dirty wounds had the highest infection rate (28.16%), and the most common isolated organism was Klebsiella (24.2%). Antibiotics such as ciprofloxacin, amikacin, and cefoperazone-sulbactam showed good sensitivity. **Conclusion:** SSIs are more frequent in emergency surgeries, contaminated wounds, and in patients with comorbidities. Early intervention, preoperative prophylaxis, and targeted antibiotic use significantly reduce SSI incidence.

KEYWORDS : Surgical Site Infection, Abdominal Surgery, Antibiotic Prophylaxis, Risk Factors.

INTRODUCTION
Surgical site infections (SSIs) remain a significant postoperative complication worldwide, contributing to prolonged hospitalization, morbidity, and increased healthcare costs. SSIs are defined as infections occurring at or near the surgical incision within 30 days postoperatively, or within one year if an implant is involved.

Despite advances in aseptic techniques and prophylactic antibiotic use, SSIs persist due to multiple interacting factors including microbial virulence, host immunity, surgical technique, and pre-existing comorbidities. This study aims to evaluate the incidence, risk factors, bacteriology, and preventive strategies associated with SSIs in abdominal surgeries conducted at KIMS and RF Amalapuram

- Objectives**
- 1. To determine the incidence of SSI in abdominal surgeries at KIMS and RF.
 - 2. To identify the predominant organisms responsible for SSIs.
 - 3. To analyze antibiotic sensitivity patterns.
 - 4. To study complications associated with SSIs.
 - 5. To evaluate the role of prophylactic antibiotics and preventive measures.

MATERIALS AND METHODS
Study Design: Prospective observational study
Study Setting: Surgical wards, Konaseema Institute of Medical Sciences and Research Foundation
Study Period: April 2023 to April 2025
Sample Size: 458 abdominal surgery cases

- Inclusion Criteria:**
- Patients undergoing abdominal surgeries with clean-contaminated, contaminated, or dirty wounds.

- Exclusion Criteria:**
- Clean surgical wounds without infection.

Data Collection: Patients were evaluated postoperatively for clinical signs of infection such as redness, discharge, pain, swelling, and systemic symptoms. Pus/wound swabs were

collected for microbiological evaluation and antibiotic sensitivity.

- RESULTS**
Incidence Of SSI
- Total cases: 458
 - Infected: 33
 - Incidence Rate: 7.2%

- Infection Rate By Type Of Surgery**
- Elective surgeries (n = 249): 8 infections (3.2%)
 - Emergency surgeries (n = 209): 25 infections (11.9%)

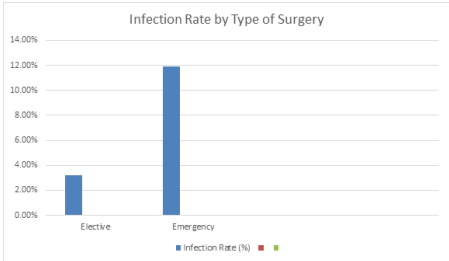


Chart-1

Infection Rate By Wound Type

Type of Wound	Total Cases	Infections	Incidence (%)
Clean-contaminated	266	4	1.5%
Contaminated	121	9	7.43%
Dirty	71	20	28.16%

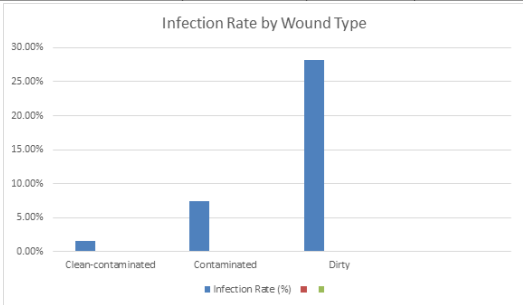


Chart-2

Surgical Procedures And Infection Rates

- **Highest SSI in emergency bowel surgeries:**
- Intestinal obstruction: 27.5%
- Perforative peritonitis: 12.6%
- Appendicitis: 5.1%

Infection Rate By Risk Factors

Risk Factor	Total Cases	Infected	%
Anemia (<9g%)	70	4	5.71%
Diabetes Mellitus	54	6	11.1%
Malignancy	64	6	9.37%

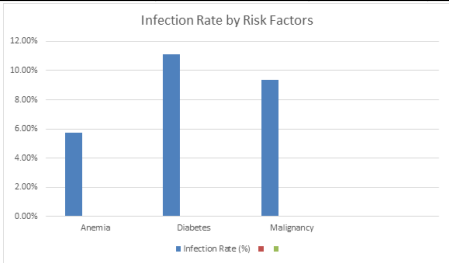


Chart-3

Infection Rate By Surgery Duration

- 3 hours: 25% infection rate
- 2 hours: 8%
- <1 hour: 1.04%

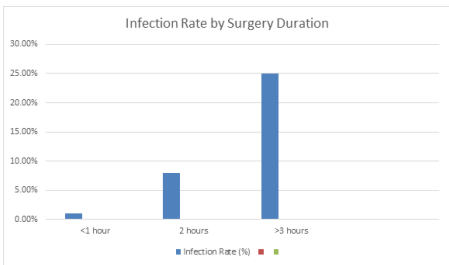


Chart-4

Effect Of Prophylactic Antibiotics

- Given: 1.6% infection
- Not given: 4.8% infection

Distribution Of Isolated Organisms

Organism	% of Infections
Klebsiella	24.2%
E. coli	18.18%
Pseudomonas	6.06%
Staphylococcus	6.06%
Acinetobacter	3.03%
No growth	42.42%

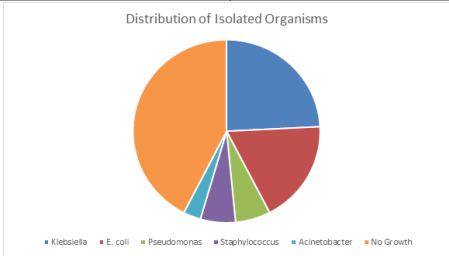


Chart-5

Antibiotic Sensitivity

- **Effective:** Ciprofloxacin, Amikacin, Cefoperazone-Sulbactam, Doxycycline
- **Moderate:** Cefotaxime, Gentamicin
- **Less Effective:** Ampicillin, Tetracycline

DISCUSSION

The study identified a 7.2% overall incidence of SSIs, consistent with global literature (range 2.8–17%). Emergency surgeries showed a higher infection rate due to factors like delayed presentation, peritonitis, and comorbidities.

SSI rates increased with the severity of wound contamination. Dirty wounds carried nearly 30% risk, reinforcing the need for rigorous surgical hygiene and targeted antimicrobial strategies.

Klebsiella and E. coli were the predominant pathogens, shifting the earlier paradigm from gram-positive (Staphylococcus) to gram-negative predominance. This highlights the need for empirical coverage of gram-negative bacteria in SSI prophylaxis.

Prophylactic antibiotics significantly reduced SSI incidence, aligning with existing evidence that timely, appropriate antibiotic administration (preferably within one hour of incision) is critical.

Other significant associations with higher infection rates included:

- Prolonged surgery duration
- Age >50 years
- Comorbid conditions like DM, anemia, malignancy
- Preoperative hair removal >24 hrs before surgery

CONCLUSION

Surgical site infection continues to be a critical factor impacting patient recovery in abdominal surgeries. The study highlights the need for:

- Strict aseptic protocols
- Early and appropriate prophylactic antibiotic administration
- Optimized surgical duration and technique
- Preoperative control of risk factors like diabetes and anemia

Targeted strategies in high-risk cases and gram-negative focused empirical therapy can significantly reduce SSIs, enhance recovery, and minimize healthcare costs.

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