



Original Research Article

PREVALENCE OF SURGICAL SITE INFECTIONS IN A TERTIARY CARE CENTRE, JAIPUR RAJASTHAN

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ABSTRACT

Introduction: Surgical site infections represent the third most prevalent form of nosocomial infection, significantly undermining surgical success rates and contributing to prolonged hospitalization.¹

Methodology: This prospective, observational study was conducted at Geetanjali Institute of Medical Sciences, Jaipur over an enrolling patient who met the Centers for Disease Control and Prevention criteria for surgical site infections. Microorganism was isolated as per CLSI guidelines and Risk were assessed as per WHO criteria.

Results: A total of 750 general surgeries were performed, Out of which 150 patients were suspected to be suffering from SSI. Out of these 150 clinically suspected cases of SSIs, bacterial pathogens were grown, cultured, and identified in 62 (41.3%) cases. The infection rate of SSI 8.26% was calculated. Out of 62(41.3%) culture positive specimens, 40 (64.51%) were males and 22 (35.5%) were females.

Conclusion: The findings from this study underscore the critical necessity of implementing targeted, evidence-based infection control measures to reduce the incidence of surgical site infections within the tertiary care setting. By prioritizing the highest quality of preoperative, intraoperative, and postoperative care to reduce the SSI burden.

Keywords: SSI, Antibiotic Resistance, Gram Positive Cocci & Gram Negative Bacilli.

INTRODUCTION

Surgical site infections represent the third most prevalent form of nosocomial infection, significantly undermining surgical success rates and contributing to prolonged hospitalization.^[1] These infections extend the duration of patient recovery by approximately 7 to 11 days, thereby increasing both the financial burden on healthcare facilities and the overall risk of morbidity.^[2]

Furthermore, the rising incidence of multidrug-resistant organisms in these settings necessitates rigorous monitoring of local etiological profiles to optimize antibiotic prophylaxis and infection control policy.^[3,4] By evaluating the specific microbiological landscape and resistance patterns unique to the Jaipur region, this study aims to provide critical data that can inform hospital-specific antimicrobial stewardship programs.^[5,6] The burden of surgical site

infections is globally recognized as a primary cause of postoperative morbidity, with estimated occurrence rates often reaching approximately 2% across all surgical procedures. However, incidence rates can fluctuate significantly depending on the clinical environment, surgical specialty, and patient-specific risk factors, with some studies reporting localized prevalence figures exceeding 12% in specific cohorts.^[7] Existing research suggests that factors such as wound classification, the duration of the operative procedure, and the presence of underlying patient comorbidities significantly influence these infection outcomes.^[8] Moreover, the emergence of multidrug-resistant pathogens frequently complicates treatment efficacy, rendering standard prophylactic regimens insufficient in high-acuity surgical environments.^[5] Such clinical challenges are exacerbated by the increasing prevalence of healthcare-associated pathogens,

which necessitate robust surveillance strategies to mitigate the resulting economic and physical burdens.^[9,10] In the context of the present study, such surveillance is essential to elucidate the prevailing microbial flora and their respective antibiograms within the tertiary care framework of Rajasthan.^[11,12]

MATERIALS AND METHODS

This prospective observational study was conducted at Geetanjali Institute of Medical Sciences, Jaipur over an enrolling patient who met the Centers for Disease Control and Prevention criteria for surgical site infections. Standardized procedures for the collection of wound swabs or pus aspirates were strictly observed to ensure the integrity of microbiological analysis, while patient demographic and clinical data were meticulously recorded to assess potential risk factors. All collected clinical samples were processed utilizing conventional culture techniques on blood and MacConkey agar to isolate and identify the underlying bacterial pathogens, followed by antimicrobial susceptibility testing in accordance with Clinical and Laboratory Standards Institute guideline.^[13] The isolates were characterized through Gram staining and biochemical testing, facilitating the identification of aerobic organisms.

RESULTS

A total of 750 general surgeries were performed in the department of General Surgery, Geetanjali Institute of Medical Sciences, Jaipur. Out of which 150 patients, were suspected to be suffering from SSI. Out of these 150 clinically suspected cases of SSIs, bacterial pathogens were grown, cultured, and identified in 62 (41.3%) cases. The remaining 88 (58.6%) pus specimens were reported as sterile. Thus, the infection rate of SSI was calculated to be 8.26%. Out of 62(41.3%) culture positive specimens, 40 (64.51%) were males and 22 (35.5%) were females.

Out of 62 pus specimens, 60 (96.8%) showed mono-microbial growth and 02 (3.22%) showed poly-microbial growth. Out of these, 42 (67.7%) were identified as Gram-positive Cocci, 18 (29.0%) as Gram-negative Bacilli, and 2 (3.22%) as *Candida* spp.

Gram positive cocci were mostly sensitive to Vancomycin 100%, Teicoplanin 98%, Linezolid (77%), While Lactose fermenting Gram negative bacilli were sensitive to Imipenem 82%, Meropenem 76%, Piperacillin- Tazobactam 66%, Amikacin 64% Cephalosporin 52%, Fluroquinolones 50% while Non lactose fermenting GNB were sensitive to Tigecycline 94%, Tobramycin 80% & Imipenem 74%, Amikacin 60% Piperacillin- Tazobactam 45%. The analysis indicated that emergency surgical interventions were associated with a statistically higher frequency of infections compared to elective procedures. Furthermore, patient demographics and

comorbidities, such as age and history of diabetes mellitus, were identified as independent risk factors contributing to the postoperative incidence.

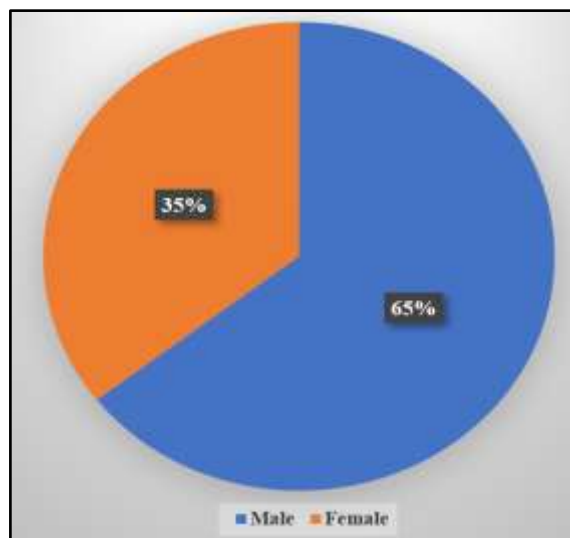


Fig 1: Sex wise distribution of SSI cases

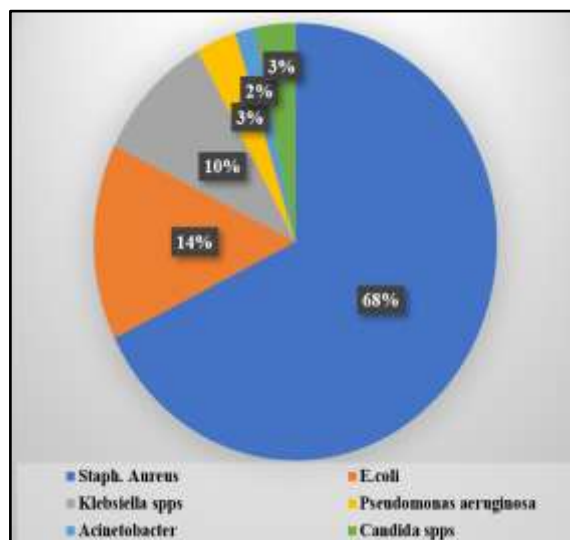


Fig 2: Bacteriological profile of SSI cases

DISCUSSION

The observed infection rate in this tertiary care center reflects the complex interplay between patient-specific susceptibility and the inherent risks associated with high-acuity surgical environments (Nisale et al., 2025).^[14] These findings emphasize the urgent need for a refined antibiotic policy that accounts for the rising prevalence of multidrug-resistant isolates within our healthcare infrastructure. Implementing targeted surveillance programs will prove vital in establishing local antibiograms, which serve as essential tools for clinicians in selecting empiric therapy that minimizes the selection pressure for resistant microbial superbugs (Bhargavi et al., 2024).^[15] Additionally, future infection control strategies should prioritize the integration of standardized perioperative protocols and enhanced

aseptic techniques to curtail the morbidity associated with secondary bacterial contamination (Kant et al., 2026).^[16] Addressing these challenges through proactive institutional monitoring may lead to substantial reductions in both the financial expenditures and the extended hospitalization periods currently observed in high-risk patients (Hameed, 2025; Talha et al., 2025).^[17,18] Moreover, fostering multidisciplinary collaboration between surgical teams and microbiology departments is critical for refining preventive strategies and ensuring evidence-based clinical management. Ultimately, such systematic integration facilitates a dynamic approach to infection control, ensuring that institutional guidelines remain adaptive to the evolving microbiological landscape (Nawaz et al., 2025).^[19] This institutional commitment to evidence-based surveillance not only enhances patient safety but also provides the longitudinal data necessary to evaluate the long-term effectiveness of standardized sterile processing and intraoperative hygiene interventions. Future research should emphasize the impact of preoperative serum albumin levels and body mass index as additional predictors of clinical outcomes, given their significant role in post-surgical recovery and immune competence (Kamarsu et al., 2024).^[20] Furthermore, the predominance of multidrug-resistant gram-negative bacteria necessitates a critical re-evaluation of current prophylactic strategies to mitigate the emergence of antimicrobial resistance and improve clinical outcomes (Gupta et al., 2022).^[21] To address these issues, it is imperative to establish robust antimicrobial stewardship programs and routine periodic surveillance of local antibiograms to break the cycle of disease transmission (Misha et al., 2021).^[22]

CONCLUSION

The findings from this study underscore the critical necessity of implementing targeted, evidence-based infection control measures to reduce the incidence of surgical site infections within the tertiary care setting. By prioritizing the highest quality of preoperative, intraoperative, and postoperative care, healthcare providers can effectively reduce the incidence of preventable complications and minimize the associated economic burden.

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