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Economic Burden Analysis of Surgical Site Infections in Multispecialty Hospitals: A Cohort Study with Cost-Effectiveness Evaluation

Amit Kumar Yadav[1], Krishan Kumar[2]

[1]Assistant Professor, Faculty of Management studies, Parul Institute of Management and Research, Parul University, Vadodara, Gujarat

[2]Postgraduate Student, Faculty of Management studies, Parul Institute of Management and Research, Parul University, Vadodara, Gujarat

Abstract: ***Surgical site infections [SSIs] are known to cause substantial illness and costs during the index hospitalizations, little information exists about the impact of infections diagnosed after surgery, which constitute the majority of SSIs. In this study, using patient questionnaire and administrative data base, we assessed the clinical outcomes and resource utilization in 12-week post –operative period associated with SSIs are recognized after discharge.***

Keywords: Surgical site infection, infection control, medical economics, utilization

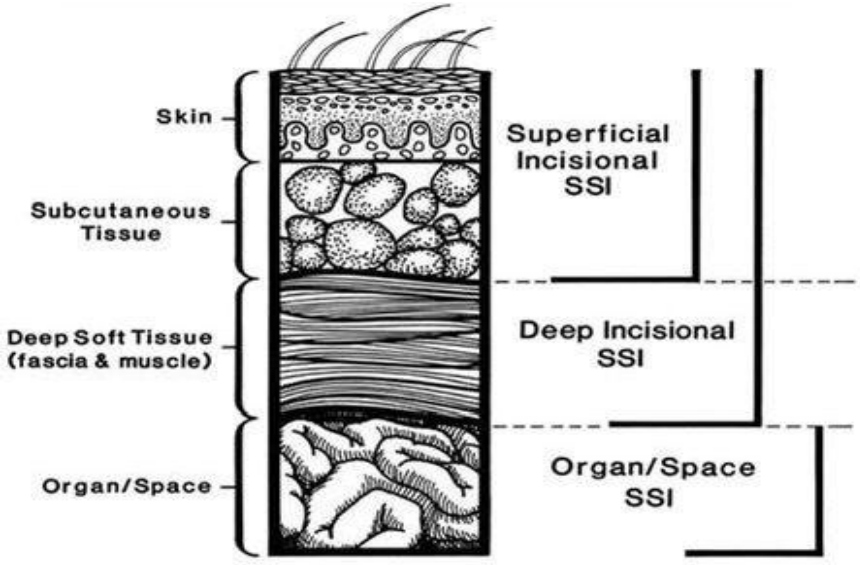
1. Introduction

Surgical site infections (SSIs) are defined as infections occurring up to 30 days after surgery (or up to one year after surgery in patients receiving implants) and affecting either the incision or deep tissue at the operation site. Despite improvements in prevention, SSIs remain a significant clinical problem as they are associated with substantial mortality and morbidity and impose severe demands on healthcare resources.

The development of an SSI causes a substantial increase in the clinical and economic burden of surgery. The financial burden of surgery is increased due to the direct costs incurred by prolonged hospitalization of the patient, diagnostic tests, and treatment. Certain patients may also require reoperation after the contraction of an SSI, which is associated with considerable additional costs.

Types of surgical site infection:

1) Superficial incisional – Involves only skin and subcutaneous tissue of the incision
2) Deep incisional – Involves deep soft tissues of the incision (eg, fascial and muscle layers)
3) Organ/Space – involves any part of the body deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure



2. Literature of Review

- Surgical site infections (SSIs) are a significant concern in healthcare, leading to increased morbidity, mortality, and healthcare costs. The World Health Organization (WHO) estimates that SSIs occur in 3-20% of surgical patients worldwide (WHO, 2016). In India, the incidence of SSIs has been reported to range from 2.5% to 41.9% (National Health Mission, 2018).

Risk Factors for SSIs:

- Several studies have identified risk factors for SSIs, including patient-related factors such as age, diabetes, and obesity (Kirkland et al., 2012; Owens et al., 2014). Procedure-related factors, such as the type and duration of surgery, have also been identified as risk factors

(Hawn et al., 2013; Schweizer et al., 2014). Additionally, hospital-related factors, such as hospital volume and staffing ratios, have been linked to SSI rates (Lichtig et al., 2013; Rothman et al., 2014).

Financial Impact of SSIs:

- SSIs impose a significant financial burden on hospitals, with estimated costs ranging from $10,000 to $30,000 per infection (Stone et al., 2014; Zimlichman et al., 2013). A study conducted in India estimated the average cost of SSIs to be ₹54,441 (approximately $700 USD) (Sharma et al., 2018).

Prevention and Control of SSIs:

- Several strategies have been shown to be effective in preventing and controlling SSIs, including proper hand hygiene, surgical site preparation, and antibiotic prophylaxis (WHO, 2016; Centers for Disease Control and Prevention, 2017). Additionally, the use of bundled interventions, such as the Surgical Care Improvement Project (SCIP), has been shown to reduce SSI rates (Hawn et al., 2013).

3. Conclusion

SSIs significantly increase healthcare costs due to prolonged hospitals stays, additional diagnostic tests, treatment with antibiotics, potential reoperations, and increased resource utilization, highlighting the critical need for robust prevention strategies to mitigate this financial burden on the hospital.

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