

Challenges and strategies in the prevention and management of surgical site infections in general surgery: a comprehensive review

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10.56238/rcsv14n2-024

ABSTRACT

The present study addresses strategies for the prevention and management of surgical site infections (SSI) in general surgery. The importance of preoperative antibiotic prophylaxis, the preparation of the patient's skin, and the meticulous surgical technique in reducing the incidence of SSI are highlighted. During surgery, maintaining a sterile environment and minimizing tissue manipulation are crucial. After surgery, post-operative care, such as wound monitoring and patient education, is essential. SSIs negatively impact patient recovery and increase hospital costs. Implementing evidence-based practices is critical to improving patient safety and reducing costs associated with SSIs.

Keywords: Surgical site infections, general surgery, antibiotic prophylaxis, postoperative care, hospital costs.

1 INTRODUCTION

Surgical site infections (SSIs) are frequent postoperative complications and constitute a significant challenge to patient safety and the efficiency of healthcare systems worldwide. In Brazil, the National Health Surveillance Agency (ANVISA) estimates that SSIs represent approximately 14% to 16% of all nosocomial infections, being the third most common in health institutions (ANVISA, 2013). SSIs not only increase patient morbidity and mortality, but also result in substantial costs for hospitals due to the need for additional treatments, prolonged length of stay, and use of more intensive resources.

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According to Souza and Oliveira (2017), the incidence of SSI in a university hospital was 10.2%, with associated risk factors including advanced age, prolonged surgery time, and the presence of comorbidities. This data underlines the importance of effective strategies for the prevention and management of SSIs, aiming to minimize the negative impacts on patients' health and hospital costs.

Effective prevention of SSIs requires a comprehensive approach that includes preoperative, intraoperative, and postoperative measures. In the preoperative period, antibiotic prophylaxis is a critical intervention. Studies have shown that administering prophylactic antibiotics one hour before the surgical incision can reduce the incidence of SSI by up to 50% (Farias & Almeida, 2017). In addition, proper preparation of the patient's skin with antiseptics, such as chlorhexidine, is essential to reduce the microbial load and prevent infections. Oliveira and Silva (2017) highlight that adequate antisepsis of the patient's skin before surgery is essential to minimize the risk of SSI, and is a standard practice in surgical safety protocols. The choice of appropriate antisepsis methods and strict adherence to these protocols are essential to ensure the effectiveness of preventive measures.

During the intraoperative period, maintenance of a sterile environment and strict control of asepsis are vital. Meticulous surgical technique, the use of sterile barriers, and minimal tissue manipulation are essential practices to prevent SSI. The adoption of strict asepsis and environmental control measures in the operating room is vital for the prevention of SSIs (Oliveira & Silva, 2017). Normatemia, adequate tissue oxygenation, and glycemic control during surgery are also important factors that influence the patient's immune response and infection prevention.

In the postoperative period, surgical wound care and patient education are crucial to prevent SSI. Machado and Costa (2019) report that the implementation of postoperative care protocols, including close wound monitoring and patient education about signs of infection, can significantly reduce the incidence of SSI. Adherence to these protocols and continuous training of health professionals are essential to ensure the effectiveness of infection control measures.

SSIs have a profound impact on patients' postoperative recovery. They are associated with increased morbidity, prolonged hospital stay, reoperations and, in severe cases, can lead to death. In addition, SSIs significantly increase hospital costs. According to Mendes et al. (2016), SSI result in a considerable increase in hospital costs due to the need for additional treatments, increased use of antibiotics, and prolonged hospital stay. These additional costs pose a challenge to health systems, especially in resource-constrained countries.

In Brazil, SSI research has focused on assessing the effectiveness of different preventive interventions and the challenges in implementing infection control measures. Lima and Santos (2019) emphasize that the challenges in implementing hospital infection control practices include resistance to change on the part of the health team and the lack of adequate resources. This research is essential

to develop evidence-based practices that can be adapted to the specific realities of Brazilian hospitals. In conclusion, prevention and appropriate management of SSIs are key to improving patients' clinical outcomes and reducing hospital costs. This paper aims to review the main strategies for SSI prevention, asepsis and infection control protocols, as well as the impact of SSIs on postoperative recovery and hospital costs.

2 OBJECTIVES

This expanded abstract aims to address in detail and critically the strategies for the prevention and management of surgical site infections (SSIs) around general surgery. To this end, the specific objectives are:

1. To analyze the main strategies for preventing SSI in the preoperative period: To investigate the efficacy of antibiotic prophylaxis and preparation of the patient's skin in reducing the incidence of SSI, with an emphasis on the appropriate choice of antimicrobials and antiseptics.
2. Evaluate intraoperative asepsis and infection control protocols: Examine recommended surgical practices for maintaining a sterile environment and minimizing contamination, including surgical technique, use of sterile barriers, and proper tissue manipulation.
3. Discuss postoperative care measures and patient education: Assess the importance of surgical wound monitoring, early recognition of signs of infection, and patient education on self-care and prevention of complications.
4. To analyze the impact of SSI on postoperative recovery and hospital costs: To investigate how SSIs affect morbidity, mortality, length of hospital stay, and hospital costs, based on studies conducted in the Brazilian context.
5. To explore the challenges in the implementation of infection control measures in Brazilian hospitals**: To identify the barriers and obstacles faced in the adoption of SSI prevention practices, considering issues such as resistance to change, lack of resources, and the need for training of the health team.

Through these objectives, we seek to provide a comprehensive and critical analysis of SSI prevention and management strategies, to contribute to the improvement of the quality of surgical care and patient safety in the area of general surgery.

3 METHODOLOGY

This expanded abstract was prepared through a systematic review of the literature. The search for relevant scientific articles was performed in electronic databases, including PubMed, Scopus and the Virtual Health Library (VHL), using the following search terms: "surgical site infection", "surgical

wound infection", "surgical site infection prevention", "surgical site infection management", "surgical site infection Brazil", among others. The filters used included studies carried out on human beings, published in Portuguese, English or Spanish, and with a publication date between the years 2010 and 2023.

Original studies, systematic reviews, meta-analyses, and clinical guidelines that addressed strategies for the prevention and management of surgical site infections around general surgery were included in the analysis. Exclusion criteria involved duplicate studies, isolated case reports, and studies focusing on other surgical specialties that were not directly related to the proposed theme.

The selection of articles was carried out in two stages: initially, the titles and abstracts were independently evaluated by two reviewers, followed by the analysis of the full texts of the articles that met the inclusion criteria. In case of disagreement, a third reviewer was consulted to resolve disagreements and ensure the validity of the selection process.

Relevant data from the selected studies were extracted and organized into thematic categories, including preoperative prevention strategies, intraoperative asepsis protocols, postoperative care measures, impact of surgical site infections on patient recovery and hospital costs, and challenges in implementing infection control measures in Brazilian hospitals.

Data analysis was performed in a critical and interpretative manner, with the aim of identifying trends, knowledge gaps and practical recommendations for the prevention and management of surgical site infections in clinical practice. All selected articles were duly cited and referenced according to ABNT standards.

4 RESULTS

After a comprehensive review of the specialized literature, results emerge that show the efficacy of strategies for the prevention and treatment of surgical site infections (SSI) in the context of general surgery. In the preoperative preventive approaches, the prophylactic administration of antibiotics before the surgical incision stands out, demonstrating effectiveness in reducing the incidence of SSI. The careful choice of antimicrobials, combined with strict adherence to antibiotic prophylaxis protocols, is of paramount importance. In addition, the prior preparation of the patient's skin with quality antiseptics, such as chlorhexidine, emerges as a key element in mitigating the microbial load and effectively preventing SSI.

Within the scope of intraoperative asepsis protocols, the meticulousness of the surgical technique associated with the use of sterile barriers are fundamental pillars in the prevention of SSI during the surgical procedure. Minimized tissue manipulation and maintaining a sterile surgical environment emerge as crucial practices to reduce the risk of contamination. In addition, measures

such as maintenance of intraoperative normothermia and adequate glycemic control have been associated with a significant reduction in SSI rates.

In the postoperative period, diligent monitoring of the surgical wound and patient education about the signs indicative of infection emerge as vital strategies in the prevention of SSI. Early identification of such signs and prompt intervention are essential to avoid serious complications. In addition, the use of antimicrobial dressings and surgical wound washing with antiseptic solutions have been shown to be effective in reducing the incidence of SSI.

Regarding the impact of SSIs on postoperative recovery and hospital costs, there is a significant increase in morbidity, mortality, and associated costs. SSIs prolong the length of hospital stay, increase the need for additional treatments, and increase care costs. In addition, SSIs are associated with higher rates of postoperative complications, which further amplifies costs and patient burdens.

5 DISCUSSION

The analysis of the results evidenced the importance of implementing comprehensive preventive measures to reduce the incidence of SSI in the surgical practice. The high incidence of SSI and its negative impact on patient recovery and hospital costs highlight the need for investment in infection prevention and control strategies.

Based on the results presented, it is concluded that the implementation of evidence-based preventive measures is essential to reduce the burden of surgical site infections in clinical practice. Investments in adequate education, training, and resources are necessary to ensure adherence to prevention protocols and improved patient safety in the surgical setting.

6 CONCLUSION

This expanded summary highlights the importance of proper prevention and management of surgical site infections in the field of general surgery. A systematic review of the literature showed the efficacy of preventive strategies, such as antibiotic prophylaxis, meticulous surgical technique, and postoperative care, in reducing the incidence of SSI and improving patients' clinical outcomes.

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