Effectiveness of Surveillance in Reducing Reoperations in Spinal Surgery

Sartini Marina[1,2], Silvia Boni[3], Alessio Carbone[2,4], Martino Oliva[2,4], Sara Pessano[5,6], Fedra Guastalli[7], Mattia Bruzzo[7], Gianluca Ottria[2], Cristina Maria Luisa[1,2]

(1) Operating Unit Hospital Hygiene, Galliera Hospital, 16128 Genoa, Italy
(2) Department of Health Sciences, University of Genoa, 16132 Genoa, Italy
(3) Department of Infectious Diseases, Galliera Hospital, 16128 Genoa, Italy
(4) Department of Medicine and Division of Medical Oncology, Galliera Hospital, 16128 Genoa, Italy
(5) Scientific Direction, Clinical Epidemiology Unit, IRCCS Giannina Gaslini, Genoa, Italy
(6) Department of Public Health, Experimental and Forensic Medicine, Unit of Biostatistics and Clinical Epidemiology, Medical Statistics and Biometry Postgraduate School, Pavia, Italy
(7) Neurosurgery Unit, Galliera Hospital, 16128 Genova, Italy

CORRESPONDING AUTHOR: *Sartini Marina, sartini@unige.it*

INTRODUCTION

Surgical site infections (SSIs) are among the most frequent complications in spinal surgery, ranking as the third most common complication in this field [1-3]. The reported incidence in the literature varies significantly, ranging from 0.7% to 16.1% [4-7]. This broad variability reflects both methodological differences among studies, which are predominantly retrospective, and the heterogeneous characteristics of the analyzed patient populations.

AIM

The aim of this study is to analyze and quantify the outcomes associated with the implementation of targeted interventions to prevent SSIs. Specifically, the investigation focuses on evaluating the effectiveness of these measures in reducing the incidence of SSIs and improving clinical outcomes.

MATERIALS AND METHODS

A prospective surveillance study on SSIs in spinal surgery was conducted starting January 1, 2023, at a hospital in Genoa, Italy. All patients undergoing elective spinal arthrodesis were enrolled, and key infection risk factors were assessed: age, sex, body mass index (BMI), ASA score, diabetes status, type of surgery, modality and timing of antibiotic prophylaxis, hair removal practices, surgery duration, number of operating room personnel, and peri- and postoperative glucose levels. A 30-day follow-up was performed. For each SSI case, the time of onset relative to surgery, infection type, and the need for surgical revision were recorded. Following the observation of an SSI outbreak, specific prevention interventions were developed and implemented.

RESULTS

A total of 309 patients were enrolled, including 203 during the period preceding the outbreak and 106 in the period following the implementation of the interventions. After the interventions were introduced, a statistically significant reduction in SSI incidence was observed ($p < 0.05$), decreasing from 10.89% in the pre-implementation period to 3.77% in the post-implementation period. To assess the effectiveness of the intervention, the expected number of infections in the absence of the implemented measures was estimated at 11. Based on this comparison, a 63.64% reduction in observed infections compared to expected values (11) was calculated, along with a 57.14% reduction in revision surgeries relative to expectations.

CONCLUSIONS

The study underlines the critical importance of active surveillance for the timely identification of rising incidence and the rapid implementation of tailored corrective strategies. The adoption of these measures significantly reduced both surgi-

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cal site infections and related revision surgeries. These findings highlight the necessity of effective surveillance systems, integrated with structured data communication processes, to support the development of targeted interventions and foster a system of continuous quality improvement in healthcare.

REFERENCES

1. White AJ, Fiani B, Jarrah R, et al. Surgical Site Infection Prophylaxis and Wound Management in Spine Surgery. Asian Spine J. 2022 Jun;16(3):451-461.
2. Lonjon G, Dauzac C, Fourniols E, et al. Early surgical site infections in adult spinal trauma: a prospective, multicentre study of infection rates and risk factors. Orthop Traumatol Surg Res 2012;98:788-94.
3. Saeedinia S, Nouri M, Azarhomayoun A, et al. The incidence and risk factors for surgical site infection after clean spinal operations: a prospective cohort study and review of the literature. Surg Neurol Int 2015;6:154.
4. Meng F, Cao J, Meng X. Risk factors for surgical site infections following spinal surgery. J Clin Neurosci. 2015 Dec;22(12):1862-6
5. Kim JH, Ahn DK, Kim JW, et al. Particular features of surgical site infection in posterior lumbar interbody fusion. Clin Orthop Surg 2015;7:337–43.
6. Ramo BA, Roberts DW, Tuason D, et al. Surgical site infections after posterior spinal fusion for neuromuscular scoliosis: a thirty year experience at a single institution. J Bone Joint Surg Am 2014;96:2038–48.
7. Zhou J, Wang R, Huo X, et al. Incidence of Surgical Site Infection After Spine Surgery: A Systematic Review and Meta-analysis. Spine (Phila Pa 1976). 2020 Feb 1;45(3):208-216.

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