

PREDICTORS OF TREATMENT FAILURE IN POST-TRAUMATIC ORTHOPAEDIC IMPLANT-ASSOCIATED INFECTIONS: THE ROLE OF METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS AND PRIOR ANTIMICROBIAL EXPOSURE



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INTRODUCTION

Orthopedic implant-associated infections (IAIO) represent one of the most serious complications of orthopedic surgery, often associated with multiple reinterventions, prolonged hospitalizations, and significant functional impairment. Despite advances in surgical and antimicrobial strategies, treatment failure rates remain high. Microbiological factors and factors related to initial management can directly influence these outcomes, but they are not yet completely defined. The objective of this study is to identify factors associated with treatment failure in patients with IAIO.

METHODOLOGY

Prospective observational cohort conducted at a tertiary trauma center in Brazil (April 2020 to March 2022). Adult patients (≥ 18 years old) with IAIO or post-traumatic osteomyelitis, followed for at least 24 months, were included. Clinical, microbiological, and therapeutic variables were analyzed. Factors with $p < 0.20$ in the univariate analysis were included in a multivariate logistic regression model.

CONCLUSION

Previous, often preventable, antimicrobial exposure and MRSA infection are strongly associated with treatment failure in IAIO. These findings reinforce the critical role of initial management and microbiology in determining outcomes, highlighting the need for antimicrobial stewardship strategies and early multidisciplinary approach. In trauma infections, initial decisions are not neutral, they determine who will succeed and who will fail.

RESULTS

A total of 65 patients (74 infections) were included. The mean age was 48.5 ± 18.6 years, with a predominance of males (73.8%). Cultures were positive in 62% of the cases, of which 59% were GNB. Treatment failure occurred in 26%. In the multivariate analysis, previous antimicrobial exposure was an independent predictor of failure (OR 5.9; 95%CI 1.6-21.8; $p = 0.008$), as well as MRSA infection (OR 12.9; 95%CI 1.1-148.4; $p = 0.040$).

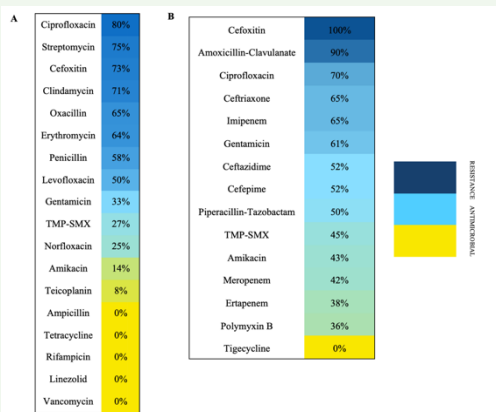


Figure 1. Antimicrobial resistance profiles of Gram-positive (A) and Gram-negative (B) isolates.

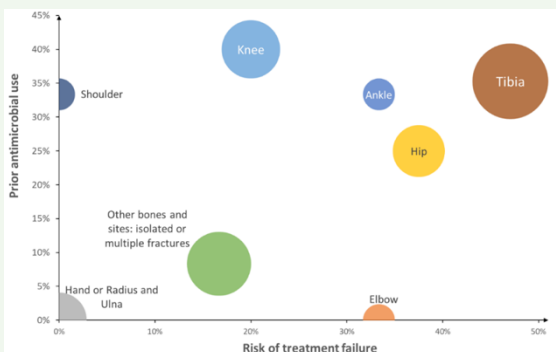


Figure 2. Relationship between treatment failure, previous exposure to antimicrobials, anatomical site of infection, and patient volume.

The Joint EBJIS-MSIS 2026 Conference

44th Annual Meeting of the European Bone & Joint Infection Society

— in cooperation with MSIS - The MusculoSkeletal Infection Society

17-19 September 2026 - Porto - Portugal

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