Local Vancomycin Administration in Orthopaedic Surgery Reduces Infection Rates – But is it Good Antibiotic Stewardship? A Systematic Review and Meta-Analysis

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INTRODUCTION:
The primary aim of this systematic review and meta-analysis is to provide a comprehensive analysis and overview of the efficacy of local vancomycin administration during primary procedures across the orthopaedic surgery specialty, as well as stratified across each subspecialty. Additionally, this paper aims to compare the microbiology of surgical site infections (SSIs) with and without the local administration of vancomycin.
METHODS:
A systematic electronic search of MEDLINE, EMBASE, and Web of Science was carried out for all English-language comparative studies comparing locally applied vancomycin to control for primary orthopaedic surgery procedures published before August 14, 2022. Studies reporting on long-acting/eluting vancomycin-impregnated cement, bone graft, and sealant were excluded.
RESULTS:
A total of 61 studies with 65,671 patients were included for analysis. There were 39,990 patients within the control groups and 25,681 within the vancomycin intervention group. For all studies, there were significantly less total surgical site infections (Odds Ratio [OR]: 0.40). Within orthopaedic spine surgery (26 studies; 16,148 patients), hip and knee arthroplasty (14 studies; 18,405 procedures), and sports medicine (11 studies; 26,985 patients), there were significantly fewer total surgical site infections (SSI); spine surgery (OR: 0.48), arthroplasty (OR: 0.32), and sports medicine (OR: 0.07). Similarly, there were statistically significant decreases for deep infections; spine surgery (OR: 0.53), arthroplasty (OR: 0.29), and sports medicine (OR: 0.07). However, for trauma surgery (5 studies; 3,198 patients) local vancomycin application favored decreased infections, it was not statistically significant; total SSIs (OR: 0.81) and deep infections (OR: 0.71). There were no systemic adverse reactions associated with local vancomycin use in any of the studies.
DISCUSSION AND CONCLUSION:
Local vancomycin administration should be considered for primary orthopaedic surgical procedures as it has sufficient local exposure to lead to reduced local infections, low systemic levels leading to virtually no systemic adverse effects, and only theoretical potential for the development of antibiotic resistance.