

Use of Intraoperative Vancomycin Powder and its Effects on the Incidence of Surgical Site Infection in Orthopaedic Trauma: A Systematic Review and Meta-Analysis

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Purpose: Surgical site infection (SSI) in orthopaedic trauma can have devastating consequences for patients. The aim of this systematic review is to evaluate the evidence for the use of powdered vancomycin in orthopaedic trauma surgery for the prevention of SSI.

Methods: A search was conducted across Pubmed/Medline, Cochrane, and Embase databases to evaluate for the use of powdered vancomycin in orthopaedic trauma surgery for the prevention of SSIs. The search used a combination of keywords and MeSH terms. Titles and abstracts were screened for inclusion criteria eligibility. Full texts were screened and included if they met eligibility criteria. A meta-analysis was completed in order to evaluate the effects of vancomycin in orthopaedic trauma surgery for the prevention of SSIs. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) standards were followed.

Results: Eight studies met final inclusion criteria for this systematic review. Three were Level I evidence studies, and the remaining five were Level III evidence studies. Of the eight studies, a statistically significant reduction in either surgical site/fracture-related infection or reduction in gram-positive SSIs were found in five. No studies found any effect on the rate of gram-negative infections. Meta-analysis demonstrated a decrease in overall SSI when powdered vancomycin was used (Odds Ratio [OR] = 0.49, 95% CI: 0.33–0.72, P = 0.0003) and a decrease in the incidence of gram-positive SSI (OR = 0.35, 95% CI: 0.14–0.84, P = 0.0185).

Conclusion: Powdered vancomycin is a safe and effective treatment option that reduces the rate of overall SSI and gram-positive SSI in orthopaedic trauma surgery patients. However, powdered vancomycin does not reduce gram-negative SSI in orthopaedic trauma patients. There was also no evidence that powdered vancomycin demonstrated any increase in the rates of aseptic wound complications, fracture nonunion, or impaired fracture healing. Powdered vancomycin can be safely used in the orthopaedic trauma setting to help reduce the incidence of SSI.