Impact of Powdered Vancomycin on Preventing Surgical Site Infections in Neurosurgery: A Systematic Review and Meta-analysis

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Introduction
Surgical site infections (SSIs) after spine and brain surgery present a major burden to patients and hospitals by increasing morbidity, mortality and healthcare costs. The aim of this study is to review available literature investigating the role of intra-wound powdered vancomycin against SSIs after neurosurgical operations.

Methods
All randomized and observational English language studies of intra-wound powdered vancomycin use in spinal and cranial surgery were included and analyzed using random-effects modeling.

Results (Continued)
- In cranial surgery (six studies with 1,777 patients), use of vancomycin was associated with a significantly lower risk for SSIs (OR: 0.41; 95% CI: 0.21–0.78; p=0.34; I²=37%).
- In meta-regression analysis, trial-level variability of diabetes had no influence on the association of vancomycin powder use with SSIs.

Results
- In spine surgery (25 studies with 16,475 patients), patients in the vancomycin group had a significantly lower risk for any SSI (OR: 0.39; 95% CI: 0.28–0.55; p<0.001; I²=47%).
- However, when separate analyses were conducted for superficial and deep SSIs, a significant difference was found only for deep (OR: 0.31; 95% CI: 0.22–0.45; p<0.001; I²=29%).
- Subgroup analyses for different vancomycin powder dosages (1g vs. 2g vs. composite dose) did not point to any dose-related effect of vancomycin.

Comparison of SSI after Spinal Surgery based on Vnaco dose

Comparison of SSI after Cranial Surgery based on Vanco use

Comparison of Deep and Superficial SSI after Spine Surgery

Learning Objectives
Participants should be able to
- Discuss the impact of vancomycin powder on reducing surgical site infection risk following cranial and spinal surgery.
- Describe the role of vancomycin on human cells and wound healing process.

Conclusions
Use of vancomycin powder in spinal and cranial surgery might be protective against SSIs, especially against deep SSIs. No dose-related effect of vancomycin powder was identified. However, caution is needed in the clinical interpretation of these results, owing to the observational design of the included studies in this meta-analysis.