Vancomycin powder

Local vancomycin powder appears to lower the risk of wound infection following lumbar laminectomy and fusion, both instrumented and non-instrumented [1].

The interpretation of the available evidence supporting the use of intrasite vancomycin powder in surgical wounds is limited, and its extrapolation should be performed with caution. Despite the lack of significant high-quality evidence available in the literature, many surgeons have adopted this practice; anecdotally it continues to provide protection from infection without apparent significant risk of side effects [2].

Findings suggest that if there is a critical threshold above which vancomycin inhibits bone healing, such a dose is out of the range which might be considered reasonable for clinical use [3].

Systematic review and meta-analysis of the clinical evidence

A total of 671 abstracts were reviewed, and 18 papers met inclusion/exclusion criteria and were included in this review. These included 1 randomized controlled trial, 13 comparative studies, and 4 case series. The level of evidence in hierarchical order was as follows: 1 level II, 13 level III, and 4 level IV. Fourteen of the studies, 1 randomized controlled trial and 13 comparative studies, were eligible for the metaanalysis. The odds of developing a deep infection with intrawound vancomycin powder were 0.23 times the odds of experiencing an infection without intrawound vancomycin (95% confidence interval 0.11-0.50, P = 0.0002, I(2) = 47%). For combined superficial and deep infections the odds ratio was 0.43 (95% confidence interval 0.22-0.82, P = 0.01, I(2) = 36%).

Numerous clinical studies have confirmed the safety of using vancomycin powder in the surgical site. The pooled clinical data supports the use of vancomycin to prevent SSIs in adult spine surgeries. The majority of the supporting literature is class III evidence. Existing studies use different definitions for surgical site infections and different pre-, peri-, and postoperative antibiotic regimens. Further high-quality investigations should use standardized protocols to confirm these findings [4].

Randomized clinical trials

A randomized, double-blind clinical trial in a single hospital was performed comparing vancomycin and placebo in thoracolumbar fusion patients.

A total of 96 patients were randomized to placebo or vancomycin treatment. The mean patient age was 43 ± 14.88 years, 74% were male, and the most common etiology was fall from height (46.9%). The overall rate of postoperative SSI was 8.3%, and no difference was found between the groups: postoperative infection rates in the vancomycin and placebo groups were 8.2% and 8.5% (relative risk [RR] of SSI not using vancomycin 1.04, 95% confidence interval [CI] 0.28-3.93, p = 0.951), respectively. Patients with diabetes mellitus had higher SSI rates (RR 8.98, 95% CI 1.81-44.61, p = 0.007).

This is the first double-blind randomized clinical trial to evaluate the effects of topical vancomycin on

postoperative infection rates in thoracolumbar fusion patients, and the results did not differ significantly from placebo.Clinical trial registration no.: RBR-57wppt (ReBEC; http://www.ensaiosclinicos.gov.br/) [5].

Debate on the effectiveness

Effectiveness

The addition of intrawound vancomycin powder in 195 consecutive posterior cervical spine surgical procedures resulted in no infections and no adverse effects [6].

Routine local application of vancomycin powder is a low-cost, effective strategy for preventing wound infection after posterior cervical fusion. [7].

The use of adjuvant vancomycin powder was associated with a significant reduction in the incidence of postoperative infection as well as infection-related medical cost. These findings suggest that use of adjuvant vancomycin powder in high-risk patients undergoing spinal fusion is a cost-saving option for preventing postoperative infections, as it can lead to cost-savings of $438,165 per 100 spinal fusions performed [8].

In the study population of Emohare et al., the cost savings totaled more than half a million dollars [9].

No effectiveness

Martin et al., found no significant difference in the incidence of deep wound infection rates after posterior cervical fusion surgery with routine use of locally applied vancomycin powder [10].

The local application of powdered vancomycin was not associated with a significant difference in the rate of deep SSI after spinal deformity surgery, and other treatment modalities are necessary to limit infection for this high-risk group. This study is in contrary to prior studies, which have reported a decrease in SSI with vancomycin powder.Level of Evidence: 2 [11].

The local application of vancomycin powder in surgical wounds did not significantly reduce the incidence of infection in patients with surgically treated spinal pathologies. The use of vancomycin powder may not be effective when incidence of infection is low.

The use of vancomycin powder in patients with Intrathecal Drug Delivery Device implants in the series of is series of Ghobrial et al., did not reduce infection rates compared to published historical controls, and was elevated compared to institutional controls [12].

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