Heparin reduced activity of vancomycin and linezolid lock solutions against S. aureus, S. epidermidis, and E. faecalis biofilms. While linezolid or vancomycin lock solution reduced overall biofilm burden, it did not completely eradicate the bacteria at tested concentrations” Luther et al (2016).

Abstract

Purpose: The activity of linezolid and vancomycin lock solutions against biofilm-producing strains of Staphylococcus aureus, S. epidermidis, and Enterococcus faecalis was studied.

Methods: Two strains each of methicillin-susceptible S. aureus (MSSA), methicillin-resistant S. aureus (MRSA), and S. epidermidis, and 1 strain of vancomycin-susceptible E. faecalis and vancomycin-resistant E. faecalis were tested against vancomycin and linezolid to assess prevention of biofilm formation and eradication of these pathogens within a formed biofilm. Activity was also tested in a 72-hour in vitro central venous catheter (CVC) model. After 24 hours of biofilm growth in a CVC, a lock solution containing vancomycin (2 or 5 mg/mL) or linezolid (1 or 2 mg/mL) alone or in combination with heparin sodium (5,000 units/mL with benzyl alcohol 0.45%) was instilled and incubated at 35 °C for 72 hr. Heparin and 0.9% sodium chloride injection were also tested.

Results: Linezolid and vancomycin prevented biofilm formation below the minimum inhibitory concentration for 88% and 25% of isolates tested, respectively. The addition of preservative-containing heparin decreased the activity of vancomycin and linezolid lock solutions against all strains. Vancomycin 2- and 5-mg/mL lock solutions had the most activity against MSSA and E. faecalis strains (p < 0.01). Linezolid 2 mg/mL was the most active lock solution against the MRSA strains tested (p < 0.01). There were no significant differences in vancomycin or linezolid lock solution activity against S. epidermidis.
Conclusion: Heparin reduced activity of vancomycin and linezolid lock solutions against S. aureus, S. epidermidis, and E. faecalis biofilms. While linezolid or vancomycin lock solution reduced overall biofilm burden, it did not completely eradicate the bacteria at tested concentrations.

Reference:


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