Antimicrobial-Lock technique for treatment of Staphylococcus aureus central venous catheter-related infection | 1

“To determine whether a bacteriophage antimicrobial-lock technique can reduce bacterial colonization and biofilm formation on indwelling central venous catheters in a rabbit model.”
Lungren et al (2014)

Reference:

Antimicrobial-Lock technique for treatment of Staphylococcus aureus CRBSI
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Abstract:

PURPOSE: To determine whether a bacteriophage antimicrobial-lock technique can reduce bacterial colonization and biofilm formation on indwelling central venous catheters in a rabbit model.

MATERIALS AND METHODS: Cuffed central venous catheters were inserted into the jugular vein of female New Zealand White rabbits under image guidance. Catheters were inoculated
for 24 hours with broth culture of methicillin-sensitive Staphylococcus aureus. The inoculum was aspirated, and rabbits were randomly assigned to two equal groups for 24 hours: (i) untreated controls (heparinized saline lock), (ii) bacteriophage antimicrobial-lock (staphylococcal bacteriophage K, propagated titer > 108/mL). Blood cultures were obtained via peripheral veins, and the catheters were removed for quantitative culture and scanning electron microscopy.

RESULTS: Mean colony-forming units (CFU) per cm2 of the distal catheter segment, as a measure of biofilm, were significantly decreased in experimental animals compared with controls (control, 1.2 × 10^5 CFU/cm2; experimental, 7.6 × 10^3; P = .016). Scanning electron microscopy demonstrated that biofilms were present on the surface of five of five control catheters but only one of five treated catheters (P = .048). Blood culture results were not significantly different between the groups.

CONCLUSIONS: In a rabbit model, treatment of infected central venous catheters with a bacteriophage antimicrobial-lock technique significantly reduced bacterial colonization and biofilm presence. Our data represent a preliminary step toward use of bacteriophage therapy for prevention and treatment of central venous catheter-associated infection.

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