CLINICAL EVIDENCE

A prospective, randomized trial of rifampicin-minocycline-coated and silver platinum-carbon-impregnated central venous catheters

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Abstract

Objective: Central venous catheters are the predominant cause of nosocomial bacteremia; however, the effectiveness of different antimicrobial central venous catheters remains uncertain. We compared the infection rate of silver-platinum-carbon (SPC)-impregnated catheters with rifampicin-minocycline (RM)-coated catheters.

Design: A large, single-center, prospective randomized study.

Setting: Twenty-two-bed adult general intensive care unit in a large tertiary metropolitan hospital in Brisbane, Australia (2000-2001).

Patients: Consecutive series of all central venous catheterizations in intensive care unit patients.
Interventions: Randomization, concealment, and blinding were carefully performed. Catheter insertion and care were performed according to published guidelines. Blood cultures were taken at central venous catheter removal, and catheter-tip cultures were performed by both roll-plate and sonication techniques. Pulsed field gel electrophoresis was used to establish shared clonal origin for matched isolates.

Measurements and Main Results: Central venous catheter colonization and catheter-related bloodstream infection were determined with a blinded technique using the evaluation of the extensive microbiological and clinical data collected and a rigorous classification system. Six hundred forty-six central venous catheters (RM 319, SPC 327) were inserted, and 574 (89%) were microbiologically evaluable. Colonization rates were lower for the RM catheters than SPC catheters (25 of 280, 8.9%; 43 of 294, 14.6%; p=.039). A Kaplan-Meier analysis that included catheter time in situ did not quite achieve statistical significance (p=.055). Catheter-related bloodstream infection was infrequent for both catheter-types (RM 4, 1.4%; SPC 5, 1.7%).

Conclusions: The SPC catheter is a clinically effective antimicrobial catheter; however, the RM catheter had a lower colonization rate. Both catheter types had low rates of catheter-related bloodstream infection. These results indicate that future studies will require similar rigorous methodology and thousands of central venous catheters to demonstrate differences in catheter-related bloodstream infection rates.