To assess the most appropriate lock solution for central venous catheters to prevent catheter-related bloodstream infections and other complications” Sheng et al (2019).

Abstract:

Background: Central venous catheters are used extensively as temporary or permanent vascular access for hemodialysis patients. Catheter-related bloodstream infections are the main complication of central venous catheters and increase morbidity and mortality in hemodialysis patients.

Objectives: To assess the most appropriate lock solution for central venous catheters to prevent catheter-related bloodstream infections and other complications.

Data sources: Medline, Embase, and Cochrane Central Register of Controlled Trials from the date of their inception to August 2018. The reference lists of eligible studies and relevant reviews were also checked.

Study eligibility criteria and participants: Randomized controlled trials (RCTs) comparing different lock solutions for the prevention of central venous catheters related infectious and bleeding complications for adult dialysis patients.

Interventions: Lock solutions for hemodialysis catheters.
Methods: The primary outcomes were catheter-related bloodstream infections and bleeding events. The secondary outcomes were catheter malfunction, exit-site infection, and all-cause mortality. We estimated summary risk ratios (RRs) using pairwise and network meta-analysis. We assessed the risk of bias of individual studies with the Cochrane risk of bias tool.

Results: 49 trials (7020 patients) were included for this study. Compared with heparin 5000U/ml, antibiotic locks (antibiotics with trisodium citrate (TSC), ethylenediaminetetraacetic acid (EDTA), heparin 5000U/ml, low-dose heparin, or urokinase) and ethanol locks were more effective in preventing catheter-related bloodstream infections. Antimicrobial agents plus low-dose heparin (500-2500 U/ml), TSC and low-dose heparin locks had lower risk of bleeding events than heparin 5000 U/ml. No lock solution reduced rates of catheter malfunction and all-cause mortality compared with heparin 5000 U/ml. In summary, antibiotics plus low-dose heparin was ranked as the best lock solution. The overall results were not materially changed in sensitivity analyses.

Conclusions: Taking into account both efficacy and safety, antibiotics plus low-dose heparin (500-2500 U/ml) may be the preferred lock solution.

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