Taurolidine-citrate-heparin lock reduces catheter-related bloodstream infections in intestinal failure patients dependent on home parenteral support: a randomized, placebo-controlled trial

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ABSTRACT

Background: In patients with intestinal failure who are receiving home parenteral support (HPS), catheter-related bloodstream infections (CRBSIs) inflict health impairment and high costs.

Objective: This study investigates the efficacy and safety of the antimicrobial catheter lock solution, taurolidine-citrate-heparin, compared with heparin 100 IE/mL on CRBSI occurrence.

Design: Forty-one high-risk patients receiving HPS followed in a tertiary HPS unit were randomly assigned in a double-blinded, placebo-controlled trial. External, stratified randomization was performed according to age, sex, and prior CRBSI incidence. The prior CRBSI incidence in the study population was 2.4 episodes/1000 central venous catheter (CVC) days [95% Poisson confidence limits (CLs): 2.12, 2.71 episodes/1000 CVC days]. The maximum treatment period was 2 y or until occurrence of a CRBSI or right-censoring because of CVC removal. The exact permutation tests were used to calculate *P* values for the log-rank tests.

Results: Twenty patients received the taurolidine-citrate-heparin lock and 21 received the heparin lock, with 9622 and 6956 treatment days, respectively. In the taurolidine-citrate-heparin arm, no CRBSIs occurred, whereas 7 CRBSIs occurred in the heparin arm, with an incidence of 1.0/1000 CVC days (95% Poisson CLs: 0.4, 2.07/1000 CVC days; $P = 0.005$). The CVC removal rates were 0.52/1000 CVC days (95% Poisson CLs: 0.17, 1.21/1000 CVC days) and 1.72/1000 CVC days (95% Poisson CLs: 0.89, 3.0/1000 CVC days) in the taurolidine-citrate-heparin and heparin arm, respectively, tending to prolong CVC survival in the taurolidine arm ($P = 0.06$). Costs per treatment year were lower in the taurolidine arm (€2348) than in the heparin arm (€6744) owing to fewer admission days related to treating CVC-related complications ($P = 0.02$).

Conclusions: In patients with intestinal failure who are life dependent on HPS, the taurolidine-citrate-heparin catheter lock demonstrates a clinically substantial and cost-beneficial reduction of CRBSI occurrence in a high-risk population compared with heparin. This trial was registered at clinicaltrials.gov as NCT01948245. *Am J Clin Nutr* doi: https://doi.org/10.3945/ajcn.117.158964.

Keywords: antimicrobial catheter lock, bacteremia, catheter infections, catheter-related bloodstream infections, central venous catheter, home parenteral support, intestinal failure, parenteral nutrition, taurolidine

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