According to our in vitro data, an ethanol-based lock solution with 40% ethanol + 60 IU heparin administered daily for 72 hours is sufficient to almost eradicate the metabolic activity of bacterial and fungal biofilms” Alonso et al (2018).

Summary:

Ethanol-based lock therapy (LT) solutions are used as an alternative to antibiotics for the conservative management of catheter-related bloodstream infection. However, no clear consensus on regimen or dose has been reached. Our objective was to find the ethanol-based lock solution containing a sufficiently low concentration of ethanol for reduction of the metabolic activity of bacterial and fungal biofilms. Using an in vitro model, we tested 3 concentrations of ethanol (25%-40%-70%), with and without 60 IU of heparin, at 6 different time points and against 24-hour preformed biofilms of Staphylococcus aureus ATCC29213, Staphylococcus epidermidis (clinical isolate), Enterococcus faecalis ATCC33186, Candida albicans ATCC14058, and Escherichia coli ATCC25922. We measured the reduction in the metabolic activity of the biofilm using the tetrazolium salt assay and considered LT to be successful when metabolic activity fell by >90%. We then tested regrowth inhibition (RI) within 24 hours and 7 days after each LT regimen only at the ethanol concentration of the most successful LT regimen. The most successful LT was achieved with 40% ethanol + 60 IU of heparin only at 24 hours, 72 hours, and 24 hours for 7-day regimens (p<0.05). However, none of the regimens reached 25% RI within 7 days of therapy. According to our in vitro data, an ethanol-based lock solution with 40% ethanol + 60 IU heparin administered daily for 72 hours is sufficient to almost eradicate the metabolic activity of bacterial and fungal biofilms. Future studies are needed to study cell regrowth after LT.

Reference:

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