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Abstract (publication only)

Comparison of various antifungal agents as catheter lock solutions in an in vitro model of *Candida* spp. biofilm

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Objectives: *Candida* spp is one of the main causative agents bacteraemia. Most of them are originated as catheter-related fungemia (CRF). The antibiotic lock technique (ALT) has been used to treat bacterial catheter colonization. Current guidelines recommends removal of the catheter when the infectious organism is *Candida* spp, however, removal is not always possible. Our objective was to evaluate the efficacy of different antifungal lock solutions using an in vitro model of CVC infection. **Methods:** The following lock solutions were evaluated: fluconazol (FLU) 10 mg/mL, anidulafungin (AND) 1 mg/mL, caspofungin (CAS) 1 mg/mL and liposomal amphotericin B, Ambisome® (AMB) 1,5 mg/mL, all alone and combined with doxycycline (DOX) 5 mg/mL, and Ethanol (ETA) 35%. PBS was used as control. Experiments were performed on full introcan Safety® 14G catheters (Braun Medical, Spain) inoculated with two clinical strains of *C. albicans* and two clinical isolates of *C. parapsilosis*. AL solutions were exchanged every 24h for 72h. After 72h, catheters were reincubated another 24 h with fresh media. Catheters were drained, flushed and sonicated at 0,4,8,24,48,72 and 96h to assess CFU/ml. Scanning electron microscopy was performed to evaluate persistence of biofilm at 0, 72 and 96h. **Results:** All antifungals resulted in significant reductions ($p < 0.05$) of $\log(10)$ CFU/mL at 72h for both *C. albicans* compared with controls, although FLU did not achieve reductions bigger than 2 $\log(10)$ CFU. AND and AMB were the most active agents and resulted in significant reductions of $\log(10)$ for both organism versus CAS and FLU ($p=0,001$). Both AND and AMB were able to reduce \log CFU below the limit of detection at 72h, however neither AND nor AMB prevent regrowth after 24h of ALT removal. ETA and DOX combinations showed similar results, but prevented regrowth with AMB and AND. Only AND and AMB resulted in significant reductions of $\log(10)$ CFU/mL at 72h for both strains of *C. parapsilosis*. Neither FLU nor CAS were able to achieve reductions $> 2 \log(10)$ CFU/mL compare to initial inoculum. ETA and DOX combinations did not resulted in a faster sterilization of the lumen but did prevent regrowth after 24 h of ALT removal. **Conclusion:** Our CVC model demonstrated that ALT with 1 mg/ml of AND and 1,5 mg/mL of AMB with either ETA or DOX eradicated biofilm and prevented regrowth suggesting it possible role in ALT and should be explored in clinical trials