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Abstract (poster session)

**Fidaxomicin persistence in an in-vitro human gut model, and adherence to Clostridium difficile spores**

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Objectives: We have previously noted the persistence of detectable fidaxomicin activity within an in-vitro human gut model for a prolonged duration compared to vancomycin. For much of this time, spores were not detected, a phenomenon not observed following vancomycin treatment. We have now investigated fidaxomicin activity within mature biofilm, and the adherence of fidaxomicin to C. difficile spores. Methods: Simulated CDI in a validated in vitro human gut model was successfully treated with fidaxomicin. Three weeks post instillation, antimicrobial activity was determined in planktonic gut model fluid compared with mature biofilm harvested from each of the 3 gut model vessels. C. difficile spores from 3 PCR ribotypes (001, 027, 106) were exposed to 200 mg/L fidaxomicin, vancomycin or non-antimicrobial containing control solutions. After 1 min and 30 mins contact time, 1 ml aliquots were centrifuged and washed three times in PBS. The persistence of antimicrobial activity was evaluated by large plate bioassays using K. rhizophila or S. aureus indicator organisms. Results: Antimicrobial activity was detected within harvested biofilm from gut model vessels 1 and 2 but not within the planktonic fluid. C. difficile was around the limit of detection in the planktonic fluid aliquots; C. difficile was detected in biofilm from all three vessels. Fidaxomicin-exposed spores of each C. difficile ribotype inhibited growth of indicator organisms after washing, whereas vancomycin-exposed and control spore preps did not. The extent of spore-associated antimicrobial activity was similar after 1 and 30 minute exposure, and for all ribotypes. The approximate antimicrobial concentration in all fidaxomicin exposed spore aliquots was 8 mg/L. Conclusion: Fidaxomicin appears to be sequestered in biofilm within the human gut model. Shedding of biofilm into the fluid phase may account for persistence of fidaxomicin and prolonged inhibition of C. difficile. Fidaxomicin also adheres to spores, which retain detectable antimicrobial activity against C. difficile after repeated washing. The persistence of fidaxomicin within biofilm and on spores may play a role in preventing recrudescence of CDI.