

IDENTIFICATION AND CHARACTERISATION OF BIOFILMS IN CHRONIC HORSE WOUNDS

Samantha Westgate¹, Steven Percival², Derek Knottenbelt¹, Christine Cochrane¹

¹University of Liverpool, Liverpool, United Kingdom, ²ConvaTec Ltd, Flintshire, United Kingdom

Background: Healing equine lower limb wounds is notoriously problematic, and poses similar problems to those encountered with human pressure ulcers and diabetic foot ulcers. These wounds are especially problematic when biofilms are present as they are naturally recalcitrant towards antimicrobial agents, and the host's immune system, as such the presence of biofilms is significant to non-healing wounds.

Aim: This study aimed to identify and characterise biofilms in chronic horse wounds and identify the genus of microbial flora of unwounded skin.

Method: Wound biopsy samples were processed for evidence of biofilms using Gram stains and standard histological dyes. Thirty equine wounds (twenty three acute and seven chronic) were swabbed according to standard protocols. Aerobic bacteria were cultured and identified using traditional microbiological culture techniques. Intact skin, representative of the wound site, was also swabbed and processed as above. In addition, these bacterial isolates were tested for their ability to form biofilms using crystal violet microtitre plate assays.

Results: Aggregates of bacteria were observed on stained biopsy samples, and a total of 140 isolates were cultured from skin and wound sites. *Staphylococcus aureus* was the most isolated genus, and *Pseudomonas aeruginosa* was cultured from 29% of chronic wounds, but not from acute wounds. Wound isolates displayed significantly more biofilm forming potential than skin isolates ($P < 0.05$), with 22% of skin isolates showing no biofilm potential.

Conclusions / discussion: This study provided evidence of biofilms within horse wounds, and identified numerous bacterial species in wound and skin sites.