

Reduction of a Multidrug-Resistant Pathogen and Associated Virulence Factors in a Burn Wound Infection Model: Further Understanding of the Effectiveness of a Hydroconductive Dressing

Bonnie Carney, BS¹, Rachel Ortiz, MS¹, Racheal M. Bullock¹, Nicholas Prinzeze, BS¹, Lauren Moffatt, PhD¹, Martin Robson, MD², Jeffrey Shupp, MD^{1,3}

Message:

Infection is a significant cause of morbidity and mortality in the hospital setting, and it is an especially relevant factor in the care and treatment of burn-injured patients. The burn wound's microenvironment can provide a medium for the growth of pathogenic organisms and for their associated production of virulence factors. Proteinaceous virulence factors produced by many commonly encountered, wound-relevant pathogens can further impede normal wound healing by degrading existing viable tissue. This study aimed to assess the effectiveness of Drawtex[®] compared to Mepilex[®] foam dressing (the "control") in reducing pathogens and virulence factors in an infected burn wound model. In addition, host wound factors were evaluated to assess effect of controlling bacteria.

Methods:

Paired burn wounds were created on the dorsum of Sprague Dawley rats and were inoculated with MRSA. Animals were divided into 2 groups, half with wounds that received Drawtex (Experimental) dressings and the remaining half with Mepilex (Control) dressing-treated wounds. Dressings remained in place through 3, 6, 9, or 14 days after injury and MRSA and virulence factors were quantified (Fig.1).

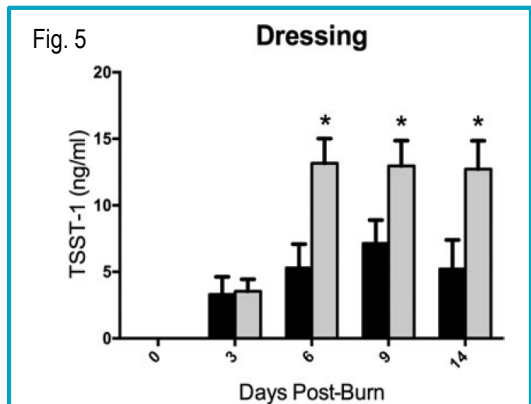
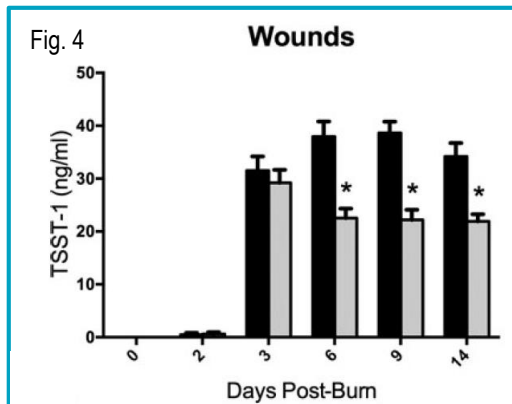
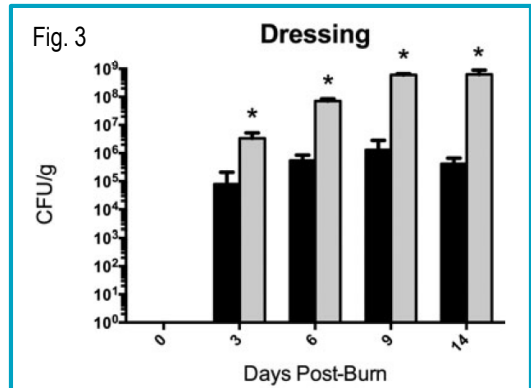
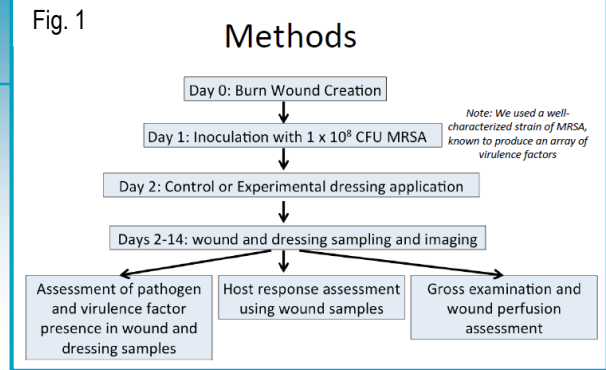
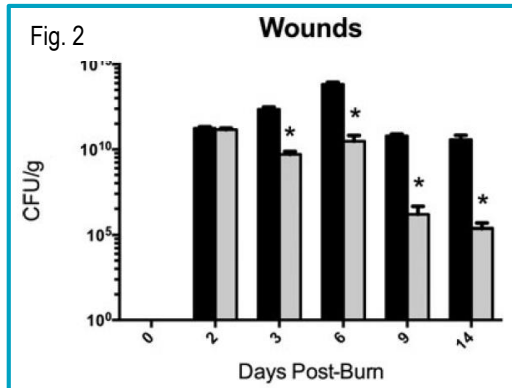
Results:

In Drawtex-treated wounds, quantities of MRSA were significantly reduced over the treatment time course, and to a greater extent than in the control dressing-treated wounds. The Drawtex dressing continued to draw off the MRSA from the wound over the entire course of treatment even though the dressings were not changed (Fig. 2). The amount drawn into the Drawtex dressings was significantly more and in the control dressings (Fig.3). Similarly, MRSA virulence factors such as those responsible for the toxic shock syndrome were drawn out of the wounds significantly more in Drawtex-treated wounds than in the Mepilex-treated control wounds (Fig.4). When evaluating the dressings, more virulence factors were in the Drawtex than in the Mepilex control dressings (Fig.5). Inflammatory host defense factors decreased over 14 days in the Drawtex-treated wounds to a greater extent than in the control wounds suggesting that decreasing bacteria and virulence factors allows the wound healing capabilities to occur in a more natural way.

Conclusion:

Drawtex provided a significant reduction in pathogen and virulence factors compared to Mepilex dressing. As a result of clearance of virulence factors from the wound bed, a requisite alteration in host immune response was observed.

■ Control □ Experimental



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Author's References:

- ¹Firefighters' Burn and Surgical Research Laboratory, MedStar Health Research Institute, Washington, DC
- ²Department of Surgery, University of South Florida, Tampa
- ³The Burn Center, Department of Surgery, MedStar Washington Hospital Center, Washington, DC

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