

Treating Chronic Wounds with Hypochlorous Acid Disrupts Biofilm

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Message:

Wound healing is a complex process and many factors, including the presence of bacteria can delay healing. Increasing evidence shows that some bacteria within chronic wounds live within biofilm communities where they are protected from host defenses and develop resistance to systemic antibiotic treatment. The most common biofilm-forming bacteria are *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

Methods:

This study evaluates the efficacy of hypochlorous acid as an agent to disrupt *Staphylococcus aureus* biofilm in a recognized biofilm model. *Staphylococcus aureus* biofilms were produced by circulating nutrient broth through Tygon tubing for 12 hours. Biofilms were treated with hypochlorous acid for 1, 3, 5, 7, and 10 minutes. After each treatment, 2 cm² pieces of tube were cut and neutralized, and bacterial numbers, residual protein, and carbohydrate content measured.

Results:

Staphylococcus aureus bacterial numbers were reduced by > log 5 CFU/cm³ following a 1-minute exposure. A reduction of > log 6 CFU/cm³ was observed after 3, 5, 7, and 10 minutes exposure to hypochlorous acid (Fig.1). This log reduction represented complete removal of the *Staphylococcus aureus* biofilm. Furthermore, approximately 70% of the biofilm polysaccharide and >90% of the biofilm protein was removed after 5, 7, and 10 minutes of contact time (Figs. 2,3).

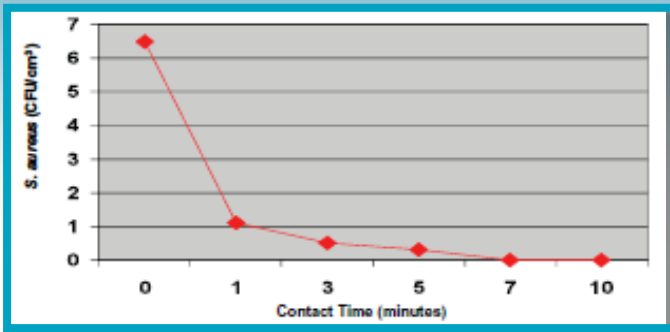


Figure 1

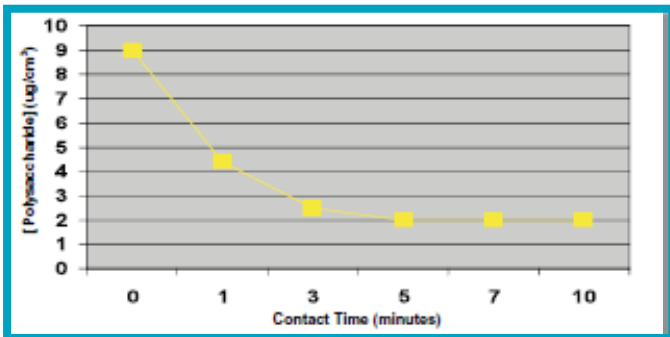


Figure 2

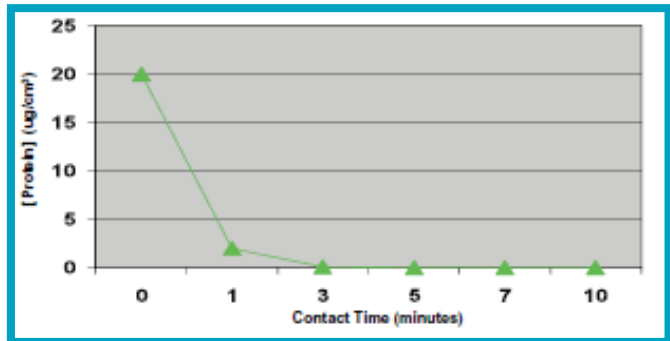


Figure 3



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