Toxic Inflammatory Cellulitis (Necrotizing Fasciitis) Treatment: Anti-Bacterial Versus Anti-Inflammatory Interventions

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Abstract
Necrotizing fasciitis (NF) is a descriptive term for the end stage of a disease process better termed ‘toxic inflammatory cellulitis’ (TIC). The four stages of wound healing are: 1) Wounding and control of bleeding; 2) Inflammatory phase; 3) Regenerative phase; and 4) Final phase of tissue remodeling. Phase 2, the destruction of defective tissue by multiple toxic products, paves the way for removal of cellular debris by monocyte ingestion. Phase 3 cannot begin until the toxic influence, along with the cellular debris, is neutralized and removed, allowing fresh cells to move into the tissue regenerative phase. Wound healing frozen in Phase 2 results in a destructive process – with an untreated mortality of over 70% – constitutes TIC. The management of TIC requires more than just antibiotics and debridement, as neutralization of the toxic mechanisms is required to change the clinical outcome. In laboratory studies, a solution of pure 0.01% hypochlorous acid* has been shown to not only inactivate pathogens but also directly neutralize bacterial toxins. In the clinical uses described here, a 0.01% hypochlorous acid* has been shown to not only inactivate pathogens but also directly neutralize bacterial toxins. In the clinical uses described here, a 0.01% hypochlorous acid has been shown to not only inactivate pathogens but also directly neutralize bacterial toxins.

Discussion
In addition to its anti-microbial activity in solution, hypochlorous acid has been shown in laboratory studies to disrupt biofilms, penetrate microbial cells, spore walls and amoeba cysts. It was also shown that pure hypochlorous acid rapidly inactivates S. aureus and S. pyogenes toxins.

These cases illustrate and justify its use in cleansing the wounds of patients who have necrotizing fasciitis. Over the last 4 years, at least 7 other patients were found with the diagnosis of NF in medical records at Seton Medical Center. They were treated with the standard therapy and 2 died, 1 had amputation and 3 survived. This fit with the expected outcome from the literature. In comparison, 7 NF patients treated with our new therapeutic algorithm resulted in no deaths and no amputations.

Conclusions
• Necrotizing fasciitis is a serious infection of the deeper layers of skin, subcutaneous tissue, and fascia. The toxicity caused by bacterial superantigens released, combined with the cellular toxins released from the damaged cells, change the patient’s situation from acute to critical, requiring surgical incision and drainage.
• The combination of pure 0.01% hypochlorous acid as a cleansing solution used for irrigation with NPWT played an important role in the recovery of our patients by rapidly killing bacteria and inactivating toxins and superantigens.
• 7 necrotizing fasciitis patients treated with our new therapeutic algorithm resulted in no deaths and no amputations, compared to 7 patients treated in the same medical center over the last 4 years with the standard therapy resulting in 2 deaths and one amputation.
• “NeutroPhase®”

References