

KEYPOINTS

- Superantigens are highly resistant to acid, heat, and protease digestion. Therefore, once secreted, they can cause pathogenic response even after all the bacteria have been killed.
- Hypochlorous acid has beneficial effects in addition to its antimicrobial activity resulting in disruption of biofilms,¹¹ penetration of microbial cells, spore walls and amoeba cysts,¹² and promoting wound repair with tissue regeneration.

nucleophilic reactivities of their sulfhydryl groups.⁴ It was shown in this work that the pure hypochlorous acid solution 0.01% used as an irrigation solution rapidly inactivates *S. aureus* and *S. pyogenes* toxins even when diluted 1000-100 000 fold. Reaction with amino compounds produces chloramines, which retain the oxidizing ability of HOCl, but are less reactive and longer lasting.¹⁶ An important representative of this class of compounds, *N*-chlorotaurine and its analogs were shown to inactivate virulence factors (ie, secretory aspartyl proteinases of *C. albicans* and *C. dublini* as well as gliotoxin of *A. fumigatus*).¹⁷ Notably, the elbow area that was not surgically debrided, and treated with the irrigation solution alone, healed rapidly and without scarring. Presumably, the neutralization of the toxins and superantigens paralleled or exceeded the results obtainable by incision and drainage therapy (Figure 3).

Conclusions

Necrotizing fasciitis is a serious infection of the deeper layers of skin, subcutaneous tissue, and fascia. The toxicity caused by Group B *Streptococcus* superantigen release changed the patient's situation from acute to critical, requiring surgical incision and drainage. It is evident that the combination of irrigation with hypochlorous acid solution 0.01% as an irrigation solution and NPWT played an important role in the recovery of this patient by rapidly killing bacteria and presumably inactivating toxins and superantigens. The authors have also demonstrated that the irrigation solution inactivates bacterial toxins *in vitro*.

References

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