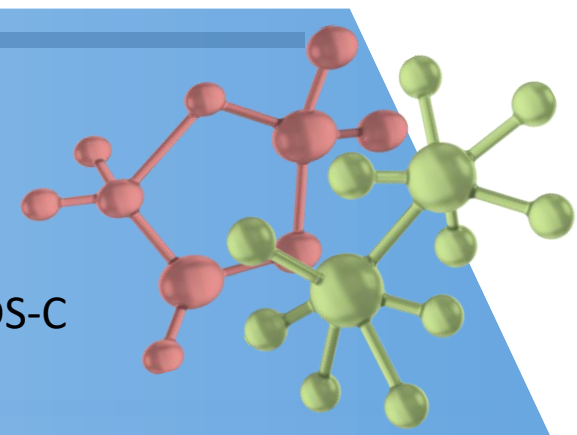


Chemical Wound Debridement with 0.50% Sodium Hypochlorite Solution

An Evidenced Based Clinical Practice Review

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INTRODUCTION

Microorganisms within a wound are the primary contributors to biofilm formation and subsequent infection. Additionally, wounds covered with necrotic or non-viable tissue require debridement to expose healthy connective tissue, reduce critical colonization, and to promote optimal wound healing. However, there are circumstances in which sharp or ultrasonic wound debridement method is not appropriate or safe for the patient. In these cases, the wound still requires timely and effective intervention to prevent deterioration and support the healing process.

SODIUM HYPOCHLORITE (NaOCl) 0.50%

Sodium hypochlorite (NaOCl) solution is a clear and highly effective organic tissue dissolver with broad-spectrum antibacterial properties, making it an excellent option for wound debridement and disinfection. It functions as both an antibacterial and proteolytic agent, providing rapid dissolution of non-viable tissue along with strong antimicrobial effects. Additionally, sodium hypochlorite is widely utilized for its oxidizing and hydrolyzing capabilities. Sodium hypochlorite (NaOCl) solution has a long history of use as an endodontic irrigant, dating back to 1936, when it was first adopted for its potent germicidal properties and its ability to dissolve the soft tissues of the dental pulp. During root canal preparation, sodium hypochlorite solutions ranging from 2.5% to 6.0% are used to achieve effective chemical-mechanical debridement of the canal. Because sodium hypochlorite contains approximately 5% free chlorine, it breaks down proteins into amino groups through chloramination reactions. Its strong alkalinity, with a pH of around 12, further contributes to its ability to dissolve necrotic tissue, making it highly effective for both antimicrobial action and organic tissue dissolution. Sodium hypochlorite (NaOCl) is a clear aqueous solution characterized by a strong chlorine odor. It is light-sensitive and upon exposure to light, it degrades and becomes water-soluble. To optimize its antimicrobial performance, sodium hypochlorite must maintain sufficient contact time with the non-viable tissue or microbial biofilm. Prolonged exposure enhances its antibacterial and proteolytic activity, whereas shorter contact intervals significantly diminish its effectiveness.

METHOD

The (5) selected patients with full thickness wound were identified in the controlled treatment group. Wound size (Length x Width x Depth) and percentage of viable and non-viable tissue was measured at baseline and during the weekly assessments. Pain, characteristics of the wound base, and peri-wound skin erythema, edema, and maceration were also assessed and documented. Calcium Alginate sheet moistened with 0.50% of Sodium Hypochlorite solution was applied to three (5) selected full thickness wounds which were in inflammatory phase of wound healing. An ABD pad was applied to all wounds as a secondary dressing and wound dressings were changed once every 24 to 48 hours. Wound progress was evaluated and recorded weekly.

EVIDENCE BASED FINDINGS / RESULTS

All five (5) patients demonstrated a positive clinical response to the 0.50% sodium hypochlorite solution, evidenced by loosening of non-viable tissue, absence of wound odor, and lack of pain, burning, or pruritus, along with the development of a healthy, granular wound bed.

DISCUSSION

As McCullough et al. highlighted, contemporary wound care has shifted the paradigm from merely preventing infection to actively creating an optimal environment for tissue repair. While some have expressed concerns that antiseptics may be excessively cytotoxic and potentially hinder healing and certain guidelines even discourage the use of agents such as NaOCl solution. This perspective overlooks the nuanced nature of wound management. Wound care is complex, and no single approach is universally superior. When used appropriately and tailored to the patient's specific clinical context, each agent offers distinct therapeutic advantages that can support, rather than impede, the healing process.

CONCLUSION

Severely infected wounds, or those covered with non-viable tissue, clearly benefit from an aggressive approach during the inflammatory phase, when the microbial burden is so high that meaningful healing is virtually impossible. The primary objective during this phase is to rapidly reduce the bioburden and remove non-viable tissue, thereby halting tissue destruction and preventing the spread of infection. When used appropriately, sodium hypochlorite solution 0.50% is highly effective in this context due to its potent antimicrobial activity and superior tissue-debridement properties.

References

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