Advances in
Biotechnology & Microbiology
ISSN 2474-7637

Juniper Publishers
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Case Report
Volume 18 Issue 3 - November 2024
DOI: 10.19080/AIBM.2024.18.555990

Adv Biotechnol Microbiol
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Role of Topical Application of Cholecalciferol and Mupirocin Ointment Combination in Wound Bed Preparation

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Submission: November 10, 2024; **Published:** November 22, 2024

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Abstract

Wounds are a common complication following burns, injuries, or infections, and while there are various methods to prevent infection and protect exposed skin, no definitive approach exists to accelerate the wound healing process. There is evidence that vitamin D can enhance initial inflammation, advantageous during both infection and wound healing, and promotes resolution and avoids chronic, damaging inflammation. Mupirocin is an antibiotic which can prevent infection. This article highlights the role of topical cholecalciferol and mupirocin ointment combination in wound bed preparation.

Keywords: Topical; cholecalciferol; Raw area management

Abbreviations: TIME: Tissue management; AMPS: Antimicrobial Peptides

Introduction

Wound management is a common challenge faced by healthcare professionals, with various approaches yielding differing levels of success. One widely used framework is the T.I.M.E. concept, which focuses on Tissue management, Infection control, Moisture regulation, and wound Edge management. [1] In this paper, we discuss our experience of using topical cholecalciferol and mupirocin combination to treat a case of a non-healing ulcer over the dorsum of right foot following post burn contracture release.[2]

Materials and Methods

This study was carried out in the Department of Plastic Surgery at a tertiary care center in South India. The patient, a 15-year-old male child, a case of Post Burn Contracture of left hand and bilateral feet, underwent contracture release, following which he had a non-healing ulcer over dorsum of right foot. We administered topical cholecalciferol mixed with mupirocin to help in wound bed preparation followed by non-adherent dressing. The dressing was removed every third or fourth day, and the wound was evaluated using the Bates Jensen Wound Assessment tool, which improved from 23 to 16 over time.[3] (Figure 1& 2)

Results

Following the application of combination of cholecalciferol and mupirocin, the wound exhibited granulation, with a noticeable reduction in exudates. No local or systemic adverse effects were observed during above therapy. With adequate wound bed preparation using topical cholecalciferol and mupirocin, split skin grafting was done. (Figure 3 & 4)

Discussion

A variety of topical antimicrobial delivery systems are available, including gentamicin embedded in collagen dressings, minocycline in chitosan polyurethane foam, ofloxacin released from silicone sheets, and dialkylcarbamoyl chloride incorporated into cotton wool dressings, among others. [3,4] These delivery systems enhance drug administration and promote wound

healing. Vitamin D, or cholecalciferol, is widely recognized for its role in calcium homeostasis, with additional functions in immunomodulation. Systemic administration of Vitamin D has been shown to support the healing of diabetic wounds effectively. [5] Vitamin D also reduces inflammation associated with wounds and serves as a drug delivery agent for targeted local wound healing. Additionally, it has been shown to enhance corneal wound healing.[6] Vitamin D functions as an antiproliferative, prodifferentiative, antiapoptotic, and immunomodulatory agent. Its application, both topically and systemically, has proven effective in treating various skin diseases. Vitamin D enhances the production of antimicrobial peptides (AMPs) such as defensin and cathelicidin, which in turn stimulate keratinocyte production and migration and increase chemokine production, including IL-8. Additionally, it exerts immunosuppressive effects on the skin by reducing antigen presentation through its action on Langerhans cells and modulating cytokine production by keratinocytes.[7]

Figure 1 & 2

Figure 3 & 4

How to cite this article: Adarsh SA, Ravi Kumar Chittoria, Rashmi V Kumar. Role of Topical Application of Cholecalciferol and Mupirocin Ointment Combination in Wound Bed Preparation. Adv Biotech & Micro. 2024; 18(3): 555990. DOI: 10.19080/AIBM.2024.17.555990

Conclusion

In this study, we observed that combination of cholecalciferol and mupirocin appears to promote wound healing and accelerate the healing process. However, as this is based on a single case study, definitive conclusions cannot be drawn. Larger, randomized controlled trials are necessary to confirm the efficacy of combination of cholecalciferol and mupirocin in wound healing.

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DOI: 10.19080/AIBM.2024.17.555990

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