Review Article

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Role of DTAC Dressing in Wound Bed Preparation

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Abstract

Bacteria Colonized wound become a major problem in wound management. Infections may lead to delayed healing process or severe complications. Thus, the incorporation of antimicrobial agents such as silver, iodine, etc., into the dressing material provides protection against microbes. One of the element available in market is Dimethyl tetradecyl [3-(trimethoxysily l) propy l] ammonium chloride (DTAC) based 3D-hydrocellular wound dressings have emerged. In this article we highlight the roleof DTAC based 3D-hydrocellular microbicidal wound dressing.

Keywords: DTAC; Dressing, Wound bed preparation; Management

INTRODUCTION

Skin is the outermost bodily tissue that protects against pathogens and external damages. It also plays a vital role in regulating water and temperature, and immunological surveillance. Micro-organisms gain entry through the damaged skin and get colonized in the wound Thus, the microbial load can be considered as a significant factor in delayed healing. Microbial load in the wound is inversely proportional to the tendency of wound healing. Such infections not only delay the healing process but may lead to severe complications resulting in prolonged hospital stays and increased cost of wound care. Antimicrobial agents impregnated dressing helps in fasten the wound healing.[1,2] Prevention and control of wound infection in the early stages or whenever possible, is vitally important aspect of wound bed management. Infection control is the major part of wound bed preparation. In this article we assess the role of Dimethyl tetradecyl [3-(trimethoxysilyl) propy[l]] ammonium chloride (DTAC) based 3D-hydrocellular microbicidal dressing.

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MATERIALS AND METHODS

This study was conducted in the department of plastic surgery in a tertiary care centre after obtaining the departmental ethical committee approval. The subject was a 31-year-old male with no known co-morbidities presenting with polytrauma including fracture of left femur and tibia. He underwent external fixation and was admitted in hospital for 5 months. He had a raw area over the left knee which was managed with wound debridement and skin grafting. The remanent non healing area of the left knee joint shows unhealthy granulation tissue with minimal slough (fig. 1). The healing of the wound was delayed. Wound culture shows persistent colonization of bacteria in

Fig. 1*:* Infected wound with unhealthy granulation tissue

Fig. 2: Application of DTAC dressing

RESULTS

DTAC technology fastens the wound healing. The wound contracted and granulated well. (Fig. 4) No complications noted with this procedure.

Fig. 4: Wound contracted and remanant raw area

the wound. For the same, we used fabric sample of size 10 cm, was cut from 3D-hydrocellular wound dressing to cover the non-healing wound over the left knee and dressing applied (Fig. 2). The Wound shows healthy granulation tissue with no slough on day 5 (Fig. 3). Preoperative Assessment

Fig. 3: Well granulated with healthy granualtion tissue

DISCUSSION

Various antimicrobial solutions and dressing materials are available for wound dressing for control of infection. Silverion solutions, Superoxide preparation, Di Alky[1] Carbamoy[1] Chloride (DACC)[2] Technology, lipido colloid with silver impregnated polyabsorbent fibre[3], Curcumin[4], Centenella Asiatica[5] extract are some of the examples about microbicidal dressing

materials. A novel technology that is non-toxic, non-leachable, effectively eliminates germs, doesn't result in medication resistance in microbes, and speeds up the healing process is needed. With technological developments, focus has switched to wound dressings based on Dimethy[l] tetradecy[l] [3-(trimethoxysilyl) propy[l]] ammonium chloride (DTAC) technology. A cationic surfactant called DTAC is employed at 1% concentration. A 3-dimensional knitted fabric made of 3D-hydrocellular wound dressing based on DTAC technology is offered under the trade names Trushield and Theruptor [Healthium Medtech Limited, India]. A hydrocellular structure is created by the DTAC- bounded polyethylene terephthalate and polyurethane material used to create the three dimensional knit fabric. DTAC based dressing effectively controls exudates, maintains the moist environment, aids in gaseous exchange, and serves as a physical barrier against pollutants. They are primarily utilized for first and second degree burns, minor, chronic, and surgical wounds that are leaking. The "physical kill mechanism" for germ protection and the non leachability of DTAC into the skin or out of the dressing are two outstanding features of DTAC technology. The cross-linking characteristic makes sure that the active ingredient stays linked to the dressing's surface. Additionally, as antimicrobial dressings, DTAC dressings eliminate the infection load at the wound site and cover a wide range of bacteria. Modern wound care could undergo a transformation thanks to DTAC-based dressings. The pathogens are removed from the wound by the DTAC technology using a physical kill mechanism, preventing them from leaking into the skin or out of the dressing. In addition to showing antimicrobial activity against a wide range of micro-organisms, these dressings were also effective from 1 minute to 28 days. These characteristics are essential for controlling all phases of wound care by providing long term defense against potential infection sources. Additionally, using 3D-hydrocellular dressings will lessen the need for routine dressing changes, lowering the cost of wound management. Based on these characteristics, DTAC based 3D-hydrocellular wound dressing can be seen as a potential solution for limiting the spread of pathogens and improving the environment for wound healing.

CONCLUSION

DTAC technology helps in the wound healing process. Large randomized studies are needed to assess the efficacy of the DTAC based Dressing material.

REFERENCES

1. The Role of Super oxidized solution in the management of Diabetic Foot Ulcers. NMCJ 2007; 9(2): 125-28.
2. Application of Di Alkyl Carbamoyl Chloride (DACC) Technology in the Management of Infection in Chronic Wounds - Case Reports. JSWCR 2016; 9(1): 46-50.
3. Role of Technology Lipido Colloid (TLC) with Silver Impregnated Polyabsorbent Fibre in the Management of Chronic Non-Healing Ulcers – A Case Report. JSWCR 2020; 13(1): 11-13.
4. Role of Curcumin in Wound Healing. Indian Journal of Biology (IJB) 2022; 9(2): 53-6.
5. Role of Centanella Asiatica Powder extract in wound healing. RFP Journal of Biochemistry and Biophysics 2021; 6(2) : 41-44.