

Nano Crystalline Silver Solution in Adult Thermal Burn

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How to cite this article:

Nikhil Bennur Nagabushana, Neljo Thomas, Ravi Kumar Chittoria/Nano Crystalline Silver Solution in Adult Thermal Burn/J Nurse Midwifery Matern Health. 2022;8(3):85–87.

ABSTRACT

The role of nano crystalline silver solution in the treatment of wounds has been widely used owing to its role in decreasing pain levels during dressing changes, decreasing the frequency of dressing changes, reducing wound exudate and bioburden levels, promoting wound healing in chronic wounds, decreasing the matrix metalloproteinase activity & its cost effectiveness. Plenty of evidence is available regarding the same in literature. Here, in our study, we are evaluating the efficacy of use of nano crystalline solution in the treatment of adult thermal burns.

Keywords: Nano crystalline silver solution, Adult thermal burns.

INTRODUCTION

Burns are among the most devastating of all injuries, with the spectrum of outcomes spanning from physical impairments and disabilities to emotional and mental consequences.¹ Majority of burns are caused by thermal energy including scalding and fires, and minority being caused by exposure to chemicals, electricity, ultraviolet radiation, and ionising radiation. Globally, fire related burns are responsible for about 265,000 deaths annually.¹ Over 90% of fatal

fire related burns occur in developing or low and middle income countries (LMICs) with South-East Asia alone accounting for over half of these fire related deaths.¹

Evidence of nanocrystalline silver solution in terms of its effectiveness and the process by which it helps in wound healing due to adult thermal burns is inadequate. Recently we came across an article regarding this, so we like to share our experience regarding use of nano crystalline solution in adult thermal burns.

MATERIALS AND METHODS

This study was conducted in tertiary care centre in department of plastic surgery after getting the department ethical committee approval. Informed consent was obtained for examination and clinical photography. The subject was 16 years old female with history of alleged suicidal self immolation with kerosene which included second degree and third degree burns involving both lower limb from ankle to thigh right side involving anterior

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Received on: 12.08.2022

Accepted on: 05.09.2022

medial and lateral surface with no evidence of compartment syndrome (Fig. 1). Patient presented with burns for further management. Patient was treated with wound hydrodebridement was done (Fig. 2) with nanocrystalline silver solution and



Fig. 1: At presentation

was used in five setting, two days apart for wound bed preparation. Post wound bed preparation tangential skin excision & skin grafting was done after 1 week of admission (Fig. 3 & 4). Skin graft healed after 14 days after grafting (Fig. 5).



Fig. 2: Hydrodebridement



Fig. 3: Tangential skin excision



Fig. 4: Post skin graft

able to see faster healing of burns area, aiding in wound bed preparation and good take of graft.



Fig. 5: Skin graft healed after 14 days

RESULTS

After using hydrodebridement with addition of nano crystalline solution, in our study, we were

DISCUSSION

Burn injuries are very common and afflict approximately 1% of the population yearly. They are a source of heavy medical burden to medical systems worldwide. Morbidity and mortality are decided by factors like: total body surface area (TBSA) involved, the anatomical location, depth of burn, the age of the subject, prior medical history involvement of other systems (especially airway injury).²

Nanocrystalline silver solutions are usually have less silver cations than silversulfadiazine cream or 0.5% silver nitrate solution but more of the silver will be released. Silver impregnated slow release dressings release minute concentrations of silver

which are quickly bound by the chloride in the wound exudate. They are effective against most common strains of wound pathogens; can be used as a protective covering over skin grafts; has a broader antibiotic spectrum activity. Animal studies suggest a role in altering wound inflammatory events and facilitation of early phase of wound healing. It also help in reducing wound infection, decreasing the frequency of dressing changes, decreases MMP (matrix metalloproteinase activity) activity.

Based on the above mentioned properties of nano crystalline silver solution, we applied the same on adult thermal burns using hydro debridement to promote wound bed preparation for early skin grafting and the results were at par with our expectations as wound bed preparation took lesser time and regular dressings.

CONCLUSION

We have found that Nano crystalline solution has been very useful in management of thermal wounds for wound bed preparation but requires large scale randomised trials for large scale application to explore the potential of the same in thermal burns.

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