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Role of Low Level Laser Therapy in Tangential Excision and Skin Grafting in Adult Scald Burns

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Abstract

The role of low level laser therapy in the treatment of wounds has been widely used owing to its role in reduction of incidence of contracture and also improving the outcome in terms of wound bed preparation and post trauma scarring. Plenty of evidence is available regarding the same in literature. Here, in our study, we are evaluating the efficacy of use of LLLT in the treatment of adult scald burns.

Keywords: Level laser therapy (LLLT); Tangential excision; Skin grafting; Adult scald 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 for Low level laser therapy in terms of its effectiveness and the process by which it helps in early preparation of wound bed is inadequate. Aim of this study is to evaluate the effectiveness of LLLT in adult scald 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 43 years old female with history of scald burns which included second

degree deep and superficial burns of 30% body surface area involving bilateral lower limbs (Fig.1). Patient presented to our casualty with burns history for further management. Appropriate treatment was start and serial dressings with LLLT (Fig. 2) was used in five setting, two days apart for wound bed preparation. Post wound bed preparation skin grafting was done (Fig. 3).

Fig. 1: Scald burns involving the bilateral lower limbs.

Fig. 3: Skin grafting post five sitting of low level laser therapy application for wound bed preparation.

Results

After application of serial dressings with addition of LLLT, in our study, we were able to reduce time taken for healing of burns area and good take of graft (Fig. 4). LLLT helped in the wound bed preparation and aided early skin grafting.

Fig. 2: Low level laser therapy application to burns site.

Fig. 4: Healed skin graft after 2 weeks

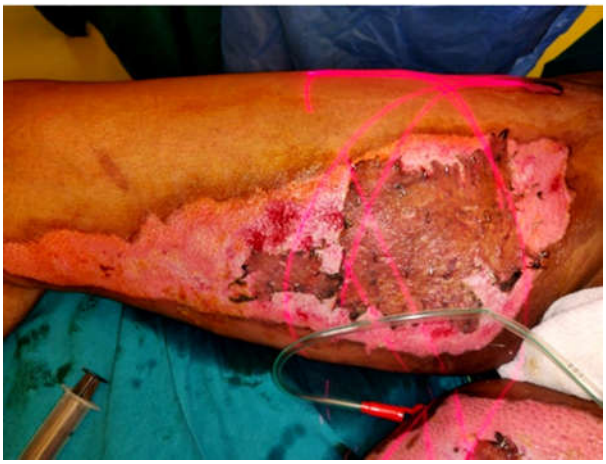

Fig. 5: Low level laser therapy post skin grafting

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]

Low-level lasers that affect biological systems without using heat include those made of Krypton, Argon, He, Ne, and ruby.When the tissue chromophores are influenced by laser energy, the cytochromes in the mitochondria absorb the laser radiation and convert them into energy by the cell (ATP), and created energy induces protein synthesis and acceleration or stimulation of cell proliferation.The interaction of light with biological tissues is influenced by various factors, including wavelength, laser dose, and the tissue's optical characteristics.The structure, water content, thermal conductivity, heat capacity, density, and capacity to absorb, disperse, or reflect the released energy are examples of tissue qualities.3-4

Based on the above mentioned properties of Laser, we applied the same on adult scald burns 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 LLLT 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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