Original Article

International Journal of Neurology and Neurosurgery
Volume 15 Number 1, January – March 2023
DOI: http://dx.doi.org/10.21088/ijnns.0975.0223.15123.1

Role of Low-Level Laser Therapy in Scald Burns

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How to cite this article:
Venkatesh. A, Ravi Kumar Chittoria, Barath Kumar Singh. P/Role of Low-Level Laser Therapy in Scald Burns/Int J Neurol Neurosurg.2023;15(1): 9-12.

Abstract

Aim of this case report is to assess the role of low-level laser therapy (LLLT) in management of scald burns. Clinical examination of the scald burns before and after the use of low-level laser therapy was done. Low level laser therapy is effective in healing of scald burns wound. LLLT (Fig. 1) may be used in scald burns wound management.

Keywords: Low level laser therapy (LLLT); Scald burns.

INTRODUCTION

Management of scald burns poses a challenge regarding improving the general condition of the patient and adequate dressing of the wound. Apart from wound cleaning and dressing, one of the available methods of wound care is low level laser therapy which is believed to affect the function of connective tissue cells (Fibroblasts), accelerate connective tissue repair, and act as an anti-inflammatory agent.[1,2] The aim of this case report is to assess the role of low-level laser therapy (LLLT) in management of scald burns.

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Received on: 25.12.2022

Accepted on: 24.02.2023

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MATERIALS AND METHODS

The study is done in a tertiary care hospital in South India. The scientific committee approval was obtained. Informed consent obtained from the patient. This is a prospective non-randomized observational study. The subject is a 37 year old male, with no co-morbidities, with alleged history of accidental spill of hot water over head under the influence of alcohol. On examination, the patient's vitals were stable. On local examination, second degree superficial burns over head and anterior neck (Fig. 2). He was admitted for management of the scald burns and burns care was given in the form of iv fluids, antibiotics and dressing. Collagen dressing, APRP, LLLT and CNPWT was also given. LLLT was given (Fig. 3).

RESULTS

LLLT is useful in reducing the size of the scald burns wound and fasten the wound healing in our patient. (Fig. 4)



Fig. 1: Low-Level Laser Therapy machine



Fig. 2. a. Scald burns before LLLT



Fig. 2. b. Scald burns before LLLT



Fig. 2. c. Scald burns before LLLT



Fig. 2 d: Scald burns before LLLT



Fig. 3. LLLT applied over scald burns



Fig. 4. Scald burns healed after LLLT

DISCUSSION

LASER can be abbreviated as "Light Amplification by Stimulated Emission of Radiation." Low Level Lasers has a power density at less than 500 mW/ cm^2. It is defined as low level laser as the energy used is very much less than that is used for cutting, ablation therapy.[3,4] Low Level Laser Therapy (LLLT) is used as an adjuvant to available therapy, especially in patients with acute and bloody ulcers. LLLT is a form of phototherapy that uses electromagnetic radiation capable of generating energy to interact with living tissues.[5,6] It produces photochemical and photophysical effects and does not produce heat, with the intention of re-establishing cell homeostasis. Essentially, light energy is delivered topically in a controlled manner and is absorbed by photo-absorbers (chromophores) that transform it into chemical energy. [7]

Positive energy includes acceleration of tissue repair, improved formation of granulation tissue, accelerated wound contraction, decreased inflammation, modulation, and pain reduction.[8]

According to the literature, low energy photo missions given at a wave length of 600 nm to 900 nm can accelerate cell proliferation and the wound healing processes. It is thought to: Stimulate respiratory chain components such as flavin and cytochromes which increase adenosine tri phosphate (ATP) synthesis, thus increasing the rate of mitoses and increasing fibroblast numbers, promote collagen and elastin production, leading to better re-epithelialisation, stimulates microcirculation and dilations of the capillaries and neovascularisation to increase tissue oxygenation,[9,10] release mediator substances such as histamine, serotonin and bradykin in to influence macrophages, rejuvenate lymphatic vessels.[11,12]

CONCLUSION

Low level laser therapy is found to be effective in improving wound healing in scald burns, by accelerating connective tissue repair.

Conflicts of Interest

This study does not require any institutional approval.

Declaration

Authors' contributions: All authors made contributions to the article

Availability of data and materials: Not applicable

Financial support and sponsorship: None

Consent for publication: Not applicable

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