

Role of LLLT in Post Varicella Scars

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How to cite this article:

Indira Ramasamy, Ravi Kumar Chittoria, Neljo Thomas/Role of LLLT in Post Varicella Scars/Ophthalmol Allied Sci. 2022;8(1): 25–27.

Abstract

The effectiveness of low-level laser for post varicella patients to reduce the pigmentation that has been caused due to scarring effect. Although low-level laser therapy its effectiveness and the process by which it reduces pigmentation are inadequate. In our study, low-level laser was performed on a subject with post varicella scars and we evaluated the efficacy and mechanism of action of a non-invasive body contouring intervention approach using LLLT.

Keywords: Low-level laser, Varicella scars, Scar.

INTRODUCTION

Chickenpox or varicella is a contagious disease caused by the varicella-zoster virus (VZV). The virus is responsible for chickenpox (usually primary infection in non-immune hosts) and herpes zoster or shingles (following reactivation of latent infection). Chickenpox results in a skin rash that forms small itchy blisters which scab over. Varicella rash commonly evolves into permanent depressed scars, leaving life-long cosmetic issues for patients. Although there are a lot of reviews on depressed

scars, the viral aetiology and the unique scar morphology of post varicella scar discriminate it from other depressed scars. Therefore it is required to assess the efficacy of scar removal modalities on these scars, specifically. Yet, despite the prevalence, there is no comprehensive review on chickenpox scars' treatment, particularly. Low-level laser therapy its effectiveness and the process by which it reduces pigmentation and scarring in varicella-zoster is inadequate. Aim of study is to evaluate the effectiveness of LLLT in post varicella scars.

MATERIALS AND METHODS

This study was conducted in a tertiary care centre in the department of plastic surgery after getting the department's ethical committee approval. Informed consent was obtained for examination and clinical photography. The subject was 23 years old male with a history of varicella infection 2 weeks back following which he started noticing scars which were pigmented depressed scars with Vancouver Scar Scale (VSS).⁶ The patient presented

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Received on: 08.07.2022

Accepted on: 00.00.2022

to our OPD for scar management and was given LLLT. Then patient underwent five applications of low-level laser therapy (LLLT) once every four weeks (Figure 1).



Fig. 1: Pre-procedure photo showing varicella scars

RESULTS

After application of LLLT over a period. In our study, we were able to successfully reduce the VSS and subjective improvement was there. (Figure 3)



Fig. 3: Post LLLT application showing scar reduction

We used Gallium Arsenide (GaAs) diode red laser wavelength 650nm, frequency 10 kHz and output power 100 Mw. Duration of therapy 125 seconds every time. (Figure 2)

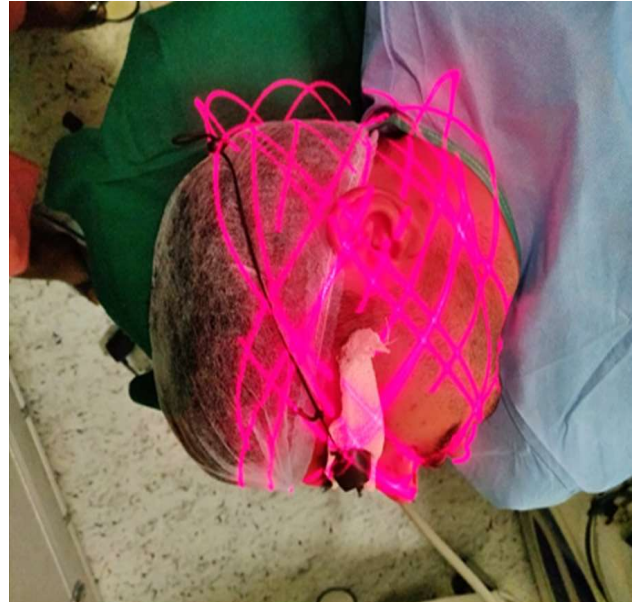


Fig. 2: LLLTI is given over the face for post varicella scars

No adverse local or systemic effect noted with the use of LLLT.

DISCUSSION

Chickenpox or varicella is caused by the varicella-zoster virus (VZV), a herpes virus with worldwide distribution. It establishes latency after primary infection, a feature unique to most herpes viruses.

It is acquired by inhalation of infected aerosolized droplets. This virus is highly contagious and can spread rapidly. The initial infection is in the mucosa of the upper airways. After 2-6 days, the virus enters the circulation and another bout of viremia occurs in 10-12 days. At this time the characteristic vesicle appears. IgA, IgM, and IgG antibodies are produced but it is the IgG antibodies that confer lifelong immunity. After the primary infection, varicella localized to sensory nerves and may reactivate later to produce shingles.¹

Atrophic scars like PVS are very challenging to treat. Therefore many techniques have been suggested to enhance the efficacy of treatment. The CO₂ and Er: YAG lasers were effective, revealing 25% to 50% improvement. Their efficacy was increased when a combination of these two lasers was used. Combination therapies including intradermal incision with Er: YAG and also, Microdermabrasion with Nd: YAG laser, were also effective, resulting

in marked improvements. In systemic medical treatments, the off-label use of topiramate and isotretinoin revealed marked improvements, but they are used limitedly in practice.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

CONCLUSION

We have found that LLLT has been very useful in

the management of post varicella scars but requires large-scale randomized trials for large-scale application to explore the potential of LLLT in the field of surgery.

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