Original Article

Journal of Microbiology and Related Research
Volume 9 Number 1, January - June 2023
DOI: http://dx.doi.org/10.21088/jmrr.2395.6623.9123.3

Role of Low Level Laser Therapy in Adult Burn Patient

Kishore Kumar[1], Ravi Kumar Chittoria[2], Amrutha JS[3]

How to cite this article:
Kishore Kumar, Ravi Kumar Chittoria, Amrutha JS/Role of Low level laser therapy in Adult Burn Patient/J Microbiol Relat Res. 2023;9(1): 25–27.

Abstract

Low level laser therapy helps in various aspects of wound healing. It has effect on cell proliferation, metabolism, angiogenesis, apoptosis and inflammation. This study assess the role of Low level laser therapy (*Low Level Laser Therapy*) in adult burns patients

Keywords: Low Level Laser Therapy; Adult Burns; Wound Healing.

INTRODUCTION

Burns injury is one of the important factors contributing to mortality in a developing country like India. Aim of this case report is to assess the role of Low level laser therapy in healing of burn wounds in adult burns patients. Clinical examination of the wound site before and after the use of Low level laser therapy was done. The normal pace of wound healing and epithelialization is at the rate of Imm/day. Optimum recovery requires the wound bed and the patient to be fit. The advanced wound healing therapies aim to hasten the process of wound healing by expediting the advancement of epithelial edge of the wound. Many newer techniques have been used to advance the epithelialization such ad *Low Level Laser Therapy*.

Authors Affiliation: [1]Junior Resident, Department of General Surgery, [2]Professor, [3]Senior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

Coressponding Author: Ravi Kumar Chittoria, Professor, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry 605006, India.

E-mail: drchittoria@yahoo.com

Received on: 09.05.2023

Accepted on: 05.06.2023

MATERIALS AND METHODS

The study is done in a tertiary care hospital in South India. The subject is a 55 year old male patient, known hypertensive for 3 years, Alleged history of accidental thermal burn with fire flame while saving his wife from burn. Patient sustained 2nd degree Flame Burn 15% TBSA involving Left Hand, Left Thigh and Leg back and Right Leg. Admitted in Burns ICU, managed with antibiotics, IV Fluids, analgesics. Six sessions of Low level laser therapy following which the wound improved well (Fig. 3).

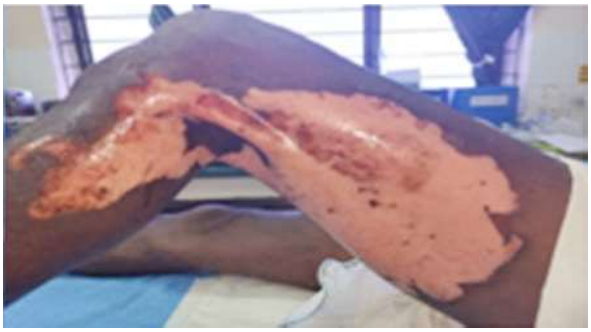

Fig. 1: 15% second degree burns at the time of admission

Fig. 2: Low level laser therapy

RESULTS

Low Level Laser Therapy is useful in improving the wound healing of burns in adult patients.

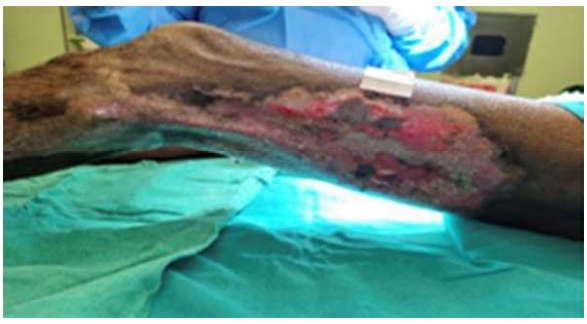

Fig 3: after 6 session of Low level laser therapy

DISCUSSION

Low level laser therapy is generated from G-As (gallium-arsenide) laser. *Low Level Laser Therapy* acts by photo biomodulation. It has effect on cell proliferation, metabolism, angiogenesis, apoptosis and inflammation. Effective *Low Level Laser Therapy* utilises wavelength of red to near infrared (600-1070 nm). *Low Level Laser Therapy* acts on cytochrome c oxidase, promotes nuclear factor kappa b which promotes cell proliferation and anti-apoptotic action. It also upregulates VEGF which promotes angiogenesis. Low level laser is applied by scanning mode and adjusted to cover the region of the wound. Application is for 5-10 minutes per weekly session. It has a stimulatory effect on raw areas and wounds by improving granulation. It softens scars by reducing fibrous tissue formation, improves blood supply and promotes nerve regeneration. It has an anti-inflammatory action, the mechanism of which is not clearly elucidated.

CONCLUSION

Low level laser therapy is found to be useful in promoting wound healing in adult burns patients.

REFERENCES

1. Hopkins JT, McLoda TA, Seegmiller JG, David Baxter G. Low level laser therapy Facilitates superficial wound healing in humans: a triple-blind, sham-controlled study. J Athl Train. 2004;39:223-229.
2. Gaida K, Koller R, Isler C, Aytekin O, Al-Awami M, Meissl G, Frey M. Low level laser therapy – a conservative approach to the Burns. 2004;30:362-367.
3. Gupta AK, Filonenko N, Salansky N, Sauder DN. The use of low energy photon therapy (LEPT) in venous leg ulcers: a double-blind, placebo-controlled study. Dermatol Surg. 1998;24:1383-1386.
4. Widgerow AD, Chait LA, StalsR, Stals PJ. New innovations in scar management. Aesthetic Plast Surg. 2000;24:227-234.
5. Van der Helder CJ, Hage JJ. Sense and nonsense of scar creams and gels. Aesthetic Plast Surg. 1994;18:307-313.
6. Nouri K, Vidulich K, Rivas MP. Lasers for scars: a review. J CosmetDermatol. 2006;5:14-22.
7. English RS, Shenefelt PD. Keloids and hypertrophic scars. Dermatol Surg. 1999;25:631-638.
8. Kitchen Ss, Partridge CJ. A review of Low level laser therapy. Physiotherapy. 1991;77:161-168.
9. Lucas C, Stanborough R. W, Greeman CL, De Haan RJ. Efficacy of low-level laser therapy on wound healing in human subjects: a systematic review. Lasers Med Sci. 2000;15:84-93.
10. Woodruff LD, Bounkeo JM, Brannon WM, Dawes KS, Barham CD, Waddell DL, Enwemeka CS. The efficacy of laser therapy in wound repair: a meta-analysis of the literature. Photomed Laser Surg. 2004;22:241-247.
11. Huang YY, Chen AC, Carroll JD, Hamblin MR. Biphasic dose response in low level light therapy. Dose Response. 2009;7:358-383.
12. Hawkins D, Abrahamse H. Changes in cell viability of wounded fibroblasts following laser irradiation in broad spectrum or infrared light. Laser Chem. 2007;2007:1-11.
13. Navratil L, Kymplova J. Contraindications in noninvasive laser therapy: truth and fiction. J Clin Laser Med Surg. 2002;20:341-343.
14. Baryza MJ, Baryza GA. The Vancouver Scar Scale: an administration tool and its interrater reliability. J Burn Care Rehabil. 1995;16:535-538.
15. Brusselaers N, Pirayesh A, Hoeksema H, Verbelen J, Blot S, Monstrey S. Burn scar assessment: a systematic review of different scar scales. J Surg Res. 2010;164:e115-e123.
16. Brusselaers N, Pirayesh A, Hoeksema H, Verbelen J, Blot S, Monstrey S. Burn scar assessment: a systematic review of objective scar assessment tools. Burns. 2010;36:1157-1164.
17. Tam SY, Tam VCW, Ramkumar S, Khaw ML, Law HKW and Lee SWY (2020) Review on the Cellular Mechanisms of Low-Level Laser Therapy Use in Oncology. Front. Oncol. 10:1255.doi: 10.3389/ fonc.2020.01255.