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سورة الرقرة الأية (٢٢)

#### LOWER LIMB ECTHYMATOUS ULCERATIONS RESPONSE TO POLARIZED LIGHT THERAPY

#### By *Islam Ahmed Abd-Elkareem*

**B.SC. "PHYSICAL THERAPY"** 





Impetigo is an inflammatory, pustular, skin disease usually caused by staphylococcus, occasionally by streptococcus. Impetigo contagiosa is a highly contagious form of impetigo, commonest on the face and scalp, characterized by bullae which become pustules and then honey-colored crusts

Ecthyma (ulcerative impetigo) is characterized by the appearance of thick adherent crusts, removed with difficulty and on removal superficial ulceration is seen. It is more common on the lower limbs of children with poor hygiene. The lesions start by small vesicle or bulla that is followed by ulceration and crusting. It tends to be protracted as the etiology is continued and on healing, the post inflammatory pigmentation and superficial scarring is seen. It is commonly streptococcal infection, rarely mixed staphylococcal and streptococcal

Polarized light from low power lasers and non-laser devices has been used as a non-invasive therapy in the treatment of various musculoskeletal disorders, acceleration of wound healing and treatment of skin ulcers, although the polarized light is known to have numerous photo-biostimulatory effects including cell proliferation, enhanced collagen synthesis, changes to the circulatory system and anti-inflammatory actions, the precise mechanism of its action still remains unclear. The available non-laser optical devices are the Bioptron products which emit a wide beam of polarized, non-coherent, polychromatic, low energy light that contain wavelengths from the visible spectrum (480-700nm) and infrared radiation (700-3400nm); this range provides optimal penetration and stimulation of the tissues without the risk of DNA damage

• Bioptron light therapy (BLT) device emits light that is polarized, polychromatic, non-coherent and of low energy. The light emitted has a wide range of wavelengths (480-3400nm) and differs from laser light, which is mono-chromatic (of narrow wavelength), coherent, polarized and of high or low energy. Possible risk of burns is present with the laser therapy, while not possible with the Bioptron light therapy. User skills are essential in laser therapy, but not essential with the Bioptron light therapy. Higher costs are present with the laser therapy, but not with the Bioptron light therapy, in addition, treatment of large area is available with the Bioptron light therapy

## **Purpose of the study**

Purposes of this study were the

To determine the therapeutic efficacy of BLT in improving healing of the ecthymatous ulcerations.

To determine the bactericidal effect of BLT in inducing microbial killing and controlling the skin infection.

To gain knowledge about the BLT application and implementation in skin diseases and sequels of the dermatological conditions.

To share in designing an ideal protocol for the treatment of the ecthymatous ulcerations.



## **Subjects**

This study was carried out on 30 patients (Males and Females) who had ecthymatous ulcerations of the lower limbs, their ages were ranged from 12 to 22 years, they were free from any immunodeficiency disorders or disease that can affect healing process and influence the results and they were selected randomly from patients of the dermatological department of Cairo university Hospitals and Monofyia university Hospitals.

### Patients groups.

Patients were randomly divided into 2 equal groups:

<u>Group A: (BLT group):</u> This group was composed of 15 patients who received the Bioptron Compact III light therapy system (BLT), in addition to the medical care of ecthymatous ulcerations (removal of crusts by gentle debridement and hydrogen peroxide plus the application of a topical antibiotic ointment).

<u>Group B:(Control group)</u>: This group was composed of 15 patients who received only the medical care of ecthymatous ulcerations (removal of crusts by gentle debridement and hydrogen peroxide plus the application of a topical antibiotic ointment).



# **Equipment Used**

#### Measuring Equipment

#### Therapeutic equipment

## Tools of tracing method to measure the ulcer surface area (USA) in cm<sup>2</sup>.



#### Tools for taking swap for the colony count (Sterile swab, media used for culture samples and gloves).



## Therapeutic equipment





# Bioptron Compact III polarized light therapy system on stand.

# Net man

## **Treatment procedures**



**Procedures of the BLT application..** 





#### Periods of evaluation.

Bars representing the mean values of the ulcer surface area in cm<sup>2</sup> of the 2 records of the experimental group (BLT application).



#### **Periods of Evaluation.**

Bars representing the mean values of the ulcer surface area in cm<sup>2</sup> of the 2 records of the control group (Routine medical care).



Periods of evaluation.

Bars representing the mean values of ulcer surface area in cm<sup>2</sup> of the 2 records of the control and the experimental groups.



#### **Periods of Evaluation.**

Bars representing the mean values of the colony counts in cell of the experimental group (BLT application).



**Periods of evaluation.** 

Bars representing the mean values of the colony count in cells of the 2 records of the control group (Routine medical care only).



**Periods of evaluation.** 

Bars representing the mean values of the colony count in cells of the 2 records of the control and the experimental

groups.



Significant differences, between the experimental (BLT application) and the control (routine medical care) groups, which were in the form of a highly significant decrease in the USA and CC, were consistent with those observed and recorded by Abrade and Latonia, 2009; Adam et al., 2009; Ballyzek et al., 2005; Bolton and Young, 2008; Dagan and David, 2007; Depuydt et al., 1999; Hoeksema et al., 2002; Iordanou et al., 2007; Kubasova et al., 1997; Medenica and Lens, 2004 and Monstrey et al., 2004.

Eventually, after the discussion of the results and according to reports of the previous investigators in fields related to this study, it can be claimed that the application of the BLT had a valuable healing effect on the lower limb ecthymatous ulcerations as evidenced by the highly significant decrease in USA and CC in patients with lower limb ecthymatous ulcerations.



The results of this study supports the expectation that using the BLT was fruitful and beneficial in decreasing the ulcer surface area and colony count as well as improving healing of the lower limb ecthymatous ulcerations as manifested by the highly decreased ulcer surface area and colony count.

