

Erchonia Laser (635 nm) on Healing of Scalpel Wound on Rats

Farouk A.H. Al-Watban MSc, PhD,
FASLMS, Glenda D. Delgado M.D.

Laser Medicine Section
Biological and Medical Research
Department
King Faisal Specialist Hospital and
Research Centre
Riyadh, Saudi Arabia

Background and Objectives: Low-level laser therapy (LLLT) is gaining increasing acceptance in the conventional medical practice as a therapy for tissue trauma and wounds. With questions arising about its safety and efficiency, a basic study on dosimetry was done to determine the optimum dose at certain frequency using this wavelength and laser device.

Materials and Methods: A number of male Sprague-Dawley rats aged 16 to 17 weeks were randomly grouped. A carefully made oval-thickness wound was created on the right flank of each rat after aseptic preparation of the site. Laser treatment was done only to the treated groups three times a week at varied doses, 1 J/cm², 5 J/cm², 10 J/cm² and 15 J/cm², at a uniform frequency (300 Hz). Daily measurement of wound area using a caliper was done until complete healing was observed.

Statistical Analysis: Mean average of the wound areas and the corresponding slopes per group were obtained. Student's T-test was done to compare differences in healing among the days and groups in relation to the control.

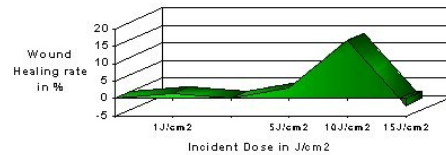
Results: Wound area measurements were standardized after determining the average of the 3 rats per group by obtaining the slopes from which the wound healing rate was calculated. The healing was found to be accelerated in doses 1 J/cm², 5 J/cm² and 10

J/cm² and inhibited in 15 J/cm². The rates were 1.36 %, 3.13 %, 16.72 % and - 1.99 % respectively.

Conclusion: It is therefore suggested that the optimum dose for this frequency, 10 J/cm² can achieve the highest stimulated healing of acute wound at this specific age group of rats and that increasing the dose will result to inhibited healing rate.

Recommendation: Since the optimum frequency cannot be established, it is our goal to pursue further study by comparing the effects using the established effective incident dose of 10 J/cm² among other frequencies (25 Hz, 100 Hz, 200 Hz and 300 Hz). Only after this time, we can probably arrive at a concrete evidence of the device' effectivity with proper dosimetry and treatment schedule that can be recommended for any safe clinical trial in the future.

Wound Healing Rate based on slope: 3-dimensional representation



$$\% \text{WHR} = \text{slope (treated group)} / \text{slope (control)} \times 100$$

*Value above 100% means accelerated healing (stimulation) while below 100% means inhibitory effect on healing.

Wound Area against Healing Day

