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Original article

Accelerating wound healing and skin loss sealing using low level laser therapy

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Abstract

Many therapeutic aids are used to accelerate wound healing and promote the healing processes; the knowledge base about the role of Low Level Laser Therapy L.L.L.T. in regeneration processes continues to grow especially in the fields of dermatology and cosmetic surgery. The aim of the current study was to present an overview of the interrelationship between the hormones involved in wound healing and irradiation with Low Level Lasers. The experiment was conducted on twenty adult male New Zealand rabbits, they were divided into two groups with 10 rabbits each: group 1 (induced wound group) and group 2 (lost skin group).The animals of the 1st. group underwent a surgical operation on the lateral aspect of the left thigh; a surgical wound with 7cm length was made and then closed by simple interrupted stitches using surgical silk 3-0, while the 2nd. group operation involved removing of a whole thickness skin square graft of (10x10 mm) dimensions. The animals of each group were divided into two subgroups (control and treated with laser irradiation). The laser used was diode with wave length 820nm and output of 200 mW. Irradiation began after the operation and continued for three days in the animals of the induced wound subgroup and seven days in the skin loss subgroup animals with 1.2 minute /session daily. Irradiation with the laser was done by directing the beam (1cm) distance from the wound or around the square area of the lost skin. Blood samples were collected at days (0, 1. 3 & 7) from the animals of the 1st. group and (1, 3, 7 &10) in the animals of the 2nd. group. The samples were taken from the marginal ear vein from all the animals and sent for examination with Enzyme-Linked Immunosorbent Assay - ELISA to determine the levels of Prostaglandin E2 (PGE2), Prostaglandin F2α (PGF2α), Growth hormone (GH) and cyclic Adenosine Monophosphate (cAMP). All the readings got from the study were tested statistically using Minitab and SPSS regression test**.** Clinically, the animals of the 1st. group showed significant variations in the time of healing being about four days in the treated subgroup and eight days in the control one. The stages of the skin defect's contraction and sealing, was faster in the animals of the treated subgroup taking nine days, while it took fifteen days in the control subgroup. Statistical evaluations revealed significant variations in the values of PGE2, PGF2α, cAMP and GH, between the two subgroups of the 1st. group, $P > 0.05$. Hormonal assessment of PGE2, PGF2α, cAMP, GH and the diameter of the skin defect for the animals of the 2nd. group showed significant variations between the two subgroups $P > 0.05$. Conclusion can be done that treating the surgical wounds and skin disorders with low level laser radiation is efficient to promote and accelerate the primary healing.

Key words: Laser, Wounds, Skin loss, Regeneration

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