

## EFFECT OF LASER THERAPY ON IMMUNE CELLS INFILTRATE AFTER EXCISIONAL WOUNDS IN DIABETIC RATS

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**Background and Objective.** Diabetes alters innate and specific immunity, causing an imbalanced tissue repair process. Very active neutrophils and macrophages are found for a long time in chronic wounds in those individuals. The aim of this study was to evaluate the response of the main effector cells of immunity (neutrophils, macrophages, and T lymphocytes) and to compare the effects of two laser therapy regimens in the postoperative treatment of excision wounds.

**Materials and Methods.** Diabetes was induced in female Wistar rats and a punch was used to cause wounds in the dorsum of each individual. The animals were randomly allocated to a control group (CG), in which the wound was untreated, a single-dose laser group (SLG), in which the wound was submitted to single dose of laser radiation (LR) with wavelength of 660 nm, power of 30 mW, energy density of 4 J/cm<sup>2</sup> and 26-second exposure time, and a fractionated-dose laser group (FLG), submitted to 1 J/cm<sup>2</sup> of LR on Days 1, 3, 8, and 10. Euthanasia was performed on 5 animals from each group Days 1, 3, 8, 10, 15, and 22. The wound was removed and routinely processed for immunohistochemistry against elastase, CD3, CD68, and CD206 antibodies. The samples were photographed and labeled cells were counted. The Kruskal–Wallis test was used for the statistical analysis.

**Results.** Neutrophils were predominant in the SLG on Day 1, whereas these cells were mostly found in the on Day 3 (P<0.05). The T lymphocyte count was similar in all groups in the throughout the experiment. On Day 3, the SLG exhibited a greater number of total macrophages (CD68+) (P<0.05), whereas the macrophage count was similar among the different groups on the other days. The CD206+ cell counts revealed that the SLG had more M2 macrophages than the CG on Day 8 (P<0.05), whereas the FLG exhibited more M2 macrophages on Day 10 (P<0.05).

**Conclusions.** LR can alter the composition of inflammatory infiltrate in diabetic wounds, leading to a more balanced response transiting from a rapid neutrophil infiltration through to M2 macrophage polarization, especially with a single application of 4 J/cm<sup>2</sup> in the immediate postoperative period.