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Effects of photobiomodulation therapy with red LED on inflammatory cells during the healing of skin burns

Thamyres Maria Silva Simões ¹, José de Alencar Fernandes Neto ¹,
Cassiano Francisco Weege Nonaka ¹, Maria Helena Chaves de Vasconcelos Catão ²

Affiliations

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Abstract

The aim of this study was to evaluate the effects of red light emitting diode (LED) photobiomodulation therapy protocol on inflammatory cells during the healing of third-degree skin burns. Fifty Wistar rats were randomly divided into control group (CTRL) (n = 25) and red group (RED) (n = 25), with subgroups (n = 5) for each time of euthanasia (7, 14, 21, 28, and 32 days). Treatment animals were daily irradiated (630 nm ± 10 nm, 300 mW, 9 J/cm² per point, 30 s, continuous emission mode) at the 4 angles of the wound (total: 36 J/cm²). After specimen removal, histological sections were stained with hematoxylin and eosin for quantitative analysis of the inflammatory infiltrate (neutrophils and lymphocytes) under light microscopy. Greater number of inflammatory cells was observed in irradiated groups when compared to CTRL at 7, 14, 21, and 28 days, but with statistically significant difference only at 14 days (p = 0.02). At 32 days, higher inflammatory cell value was observed in CTRL when compared to RED, but with no statistically significant difference (p = 0.91). The results suggest that red LED, according to the protocol used, modulates the number of inflammatory cells in the early stages of the healing of third-degree skin burns. Nevertheless, this low-intensity light therapy may not, be efficient in reducing the number of neutrophils and lymphocytes in advanced stages of the repair process of skin burns. Further studies with other therapy protocols are needed to assess the effects of this type of light on the inflammatory response of skin burns.

Keywords: Burns; Inflammation; Low-level light therapy; Wound healing.

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