

INVESTIGACIÓN - MEDICINA

DURABILITY OF THE EFFECTS OF PHOTOBIMODULATION THERAPY ON PULMONARY INFLAMMATION IN AN EXPERIMENTAL

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Photobiomodulation therapy (PBMT) has emerged as a promising alternative for asthma treatment, offering significant benefits compared to conventional therapies, but without associated side effects. Therefore, the aim of this study was to evaluate the durability of PBMT effects on lung inflammation in an experimental model of asthma. The study included seven groups (n = 7). Animals were sensitized with OVA (s.c.) on days 0 and 14. Starting on day 21, animals received OVA via orotracheal instillation once (OVA 72h group), three times (OVA 1w group), or six times (OVA 2w group). PBMT was applied only

once, using a diode laser with the following parameters: 660 nm, 100 mW, 3 J of energy, spectral width ± 20 nm, continuous mode, radiant exposure (J/cm^2) of 66, beam area at the target (cm^2) of 0.0045, exposure time of 30 s, single frequency, three application points, and a 1 cm distance from the target. Irradiation was performed one hour after the first challenge in each corresponding group (OVA+PBMT 72h, OVA+PBMT 1w, and OVA+PBMT 2w). The Basal group consisted of untreated, unmanipulated animals. Twenty-four hours after the last challenge, animals were euthanized, and bronchoalveolar lavage fluid (BALF) was collected for cell count and inflammatory mediator analysis. The results showed that the OVA groups exhibited a significant increase in total cell count, eosinophils, lymphocytes, IL-4, IL-5, IL-1 β , IL-17, and IFN- γ levels in the BALF compared to the Basal group ($p < 0.05$), whereas the OVA+PBMT groups showed a significant reduction in these parameters ($p < 0.05$) compared to their respective OVA groups. Moreover, PBMT significantly increased IL-10 levels in the OVA+PBMT groups compared to their untreated counterparts ($p < 0.05$). These findings reinforce the anti-inflammatory and immunomodulatory role of PBMT, highlighting its therapeutic potential in experimental models of asthma.

Palavras-chave: asthma; pulmonary inflammation; low-level laser; photobiomodulation therapy.