

INVESTIGACIÓN - MEDICINA

EFFECTS OF PHOTOBIOMODULATION COMBINED OR NOT WITH DEXAMETHASONE ON VIABILITY AND INFLAMMATORY MARKERS IN M1 MACROPHAGES

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INTRODUCTION: Inflammation is essential for tissue defense and repair. However, its dysregulation may lead to chronic diseases. Macrophages play a central role, polarizing into M1 (pro-inflammatory) or M2 (anti-inflammatory)

phenotypes. Dexamethasone (DEXA) is widely used to control inflammation but may cause cytotoxicity. Photobiomodulation (PBM), using low-level laser therapy, has shown potential in modulating inflammatory responses with fewer side effects. **OBJECTIVE:** To evaluate, in vitro, the effects of PBM, DEXA, and their combination on cell viability and the expression of TNF- α and IL-6 in J774 macrophages activated to the M1 profile. **METHODOLOGY:** J774 macrophages were divided into seven experimental groups: (1) Control, (2) M1, (3) M1 + PBM, (4) M1 + DEXA 2 μ M, (5) M1 + DEXA 4 μ M, (6) M1 + PBM + DEXA 2 μ M, (7) M1 + PBM + DEXA 4 μ M. Activation was performed using LPS (1 μ g/mL) and IFN- γ (0.2 μ g/mL). PBM was applied using a 780 nm laser (70 mW, 17.5 J/cm², 1 J). Cell viability was assessed by MTT and cytokines by ELISA at 24 and 48 h. **RESULTS:** At 24 h, the PBM + DEXA 2 μ M group showed significantly higher cell viability than DEXA alone, while DEXA 4 μ M reduced total protein content. Both DEXA concentrations decreased TNF- α and IL-6 levels; however, PBM partially mitigated these anti-inflammatory effects. **CONCLUSION:** The combination of PBM with DEXA 2 μ M showed a synergistic effect, balancing anti-inflammatory action with better cell viability. These findings support the potential use of PBM as a coadjuvant to glucocorticoid therapy. As a continuation in the PhD project, gene expression analysis of cytokines will be performed using PCR to complement and deepen the inflammatory profile findings.

Palavras-chave: inflammation; photobiomodulation; dexamethasone.