

INVESTIGACIÓN - MEDICINA

EFFECT OF PHOTOBIMODULATION IN AN IN VITRO EXPERIMENTAL MODEL OF ASTHMA AND COPD OVERLAP SYNDROME

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Asthma and COPD (Chronic Obstructive Pulmonary Disease) are chronic inflammatory conditions with high prevalence in the global population. Asthma-COPD Overlap Syndrome (ACOS) can be diagnosed in patients who exhibit features of both conditions. However, the clinical characteristics are not yet fully recognized or clearly defined. Treatment is based on behavioral interventions, along with pharmacological approaches, primarily involving the use of inhaled glucocorticoids. Photobiomodulation therapy (PBM) is known to have beneficial effects on lung diseases. This study aimed to evaluate the effects of PBM on the inflammatory process in an in vitro experimental model of ACOS. Cells were plated (5×10^4 cells/well) in 24-well plates. Six experimental groups (n=4) were established using human bronchial epithelial cells (BEAS-2B). After 24 hours of

culture, the cells were incubated or not with cigarette smoke extract (CSE) 100µl (2.5%) and house dust mite (HDM) 1µg/ml. After 1 hour, the plates were irradiated with a diode laser (660nm, 30mW, 5,4J, 180s) or dexamethasone (DEXA) diluted in DMSO (dimethyl sulfoxide) 10⁻⁷ M. The groups were divided into: Baseline group; CSE + HDM - positive control (ACOS group); DEXA-treated cells; Laser-irradiated cells; CSE + HDM + DEXA group; CSE + HDM + LASER group. After 24 hours, cytokine levels were quantified and a reduction (p<0,05) was observed in the levels of IL-1β, IL-6, TNF-α, IL-4, IL-5, IL-13, IL-17, IL-21 and IL-23, along with an increase (p<0,05) in IL-10 and IFN-γ in laser-irradiated ACOS group cells compared to the positive control group. These results suggest that photobiomodulation may beneficially modulate the inflammation of ACOS. However, further studies are needed to consider PBM as a potential therapeutic option for this condition.

Palavras-chave: asthma-copd overlap syndrome; acos; photobiomodulation therapy.