

INVESTIGACIÓN - MEDICINA

EFFECT OF PHOTOBIOMODULATION IN AN EXPERIMENTAL MODEL OF LUNG ADENOCARCINOMA

Cintia Estefano Alves Silva (cintialves@outlook.com)

Edgar Neto (dr.edgardneto@gmail.com)

Tawany Gonçalves Santos (tawany_goncalves@uni9.edu.br)

Kelly Gomes Santana (kelly.gsantana@gmail.com)

Keilla Santos Soares (keilla.soarescd@gmail.com)

Isadora Nilsson Mechenas (isadoramechenas@gmail.com)

Marcus Vinicius De Moraes (marcus.moraes@uni9.edu.br)

Ana Paula Ligeiro De Oliveira (apligeiro@uni9.pro.br)

Cancer is characterized by abnormal cell growth with the potential to invade surrounding tissues. Lung adenocarcinoma (LA) is a histological subtype of lung cancer. Although surgery is considered the gold standard treatment, most cases are managed with advanced therapeutic approaches, making surgical intervention unfeasible. Consequently, there is growing interest in alternative therapies, such as photobiomodulation therapy (PBMT). This study aimed to evaluate the effects of PBMT in an experimental model of urethane-induced lung

adenocarcinoma. C57BL/6 mice were used and received two intraperitoneal injections of urethane (1 g/kg), one week apart, to induce lung adenocarcinoma. Two weeks after induction, the animals underwent PBMT using a 660 nm laser, with a power output of 30 mW and an energy dose of 3 J. The animals were divided into four experimental groups (n=7): Basal (unmanipulated); PBMT (laser-treated); LA (urethane-induced); and LA + PBMT (urethane-induced and treated with photobiomodulation). After euthanasia, bronchoalveolar lavage (BAL) was performed to assess the inflammatory infiltrate and quantify the cytokines IL-1 β , IL-6, IL-10, IFN- γ , and TNF- α . The LA group showed a significant increase in inflammatory cells in the BAL compared to the Basal group ($p<0.05$), which was reduced after PBMT treatment ($p<0.05$). Moreover, the LA group exhibited elevated levels of IL-6 and TNF- α and reduced IL-10 compared to the Basal group ($p<0.05$). In the LA + PBMT group, PBMT reduced IL-6 and TNF- α levels, while increasing IL-10 and IFN- γ compared to the untreated LA group ($p<0.05$). These findings suggest a potential therapeutic effect of PBMT in modulating the inflammatory response in an experimental model of lung adenocarcinoma. PBMT reduced inflammatory cell infiltration and promoted a shift in the cytokine profile indicative of anti-inflammatory and immunomodulatory effects.

Palavras-chave: lung adenocarcinoma; photobiomodulation therapy (pbmt); urethane-induced model; cytokines.