In vitro study of COPD caused by smoking: effect of photobiomodulation associated with mesenchymal stem cells on the release of inflammatory mediators.

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**Abstract:**

Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation and alveolar enlargement. Several experimental models have been proposed for the discovery of new therapeutic options. Thus, mesenchymal stem cells (MSCs) and photobiomodulation (PBM) have been studied for their immune system modulating functions. The aim of this study was to investigate the effects of PBM associated with deciduous tooth MSCs on inflammatory mediators in bronchial epithelial cells (BEAS) induced by cigarette smoke extract (CSE). Human bronchial epithelial cells (BEAS-2B) were cultured (5x104 cells / well) and after 24 hours, the cells were incubated with CSE. 1 hour later irradiated with 808nm, 30mW, 60 seconds / well diode laser and / or MSCs extracted from tooth pulp, cultivated and characterized by the presence of CD90+, CD73+ and absence of CD34. After 24 hours, the supernatant was collected and the mediators were dosed. The effects of the association of PBM with MSCs on the release of cytokines (IL-6, IL-10 and IFN-γ) were evaluated by ELISA. Results: CSE increased levels of IFN-γ (p <0.001), decreased levels of IL-10 (p <0.001), did not change levels of cytokines of IL-6. Groups treated with MSCs showed an increase compared to the other groups (p <0.001). There was a significant decrease in IFN-γ (p <0.001), and an increase the IL-10 (p <0.001) in the treated groups. In vitro treatment with MSCs and PBMs of CSE treated cells can be promising on the effects of the 808nm laser in the treatment of patients with COPD.