

Local (but not systemic) photobiomodulation treatment reduces mast cell degranulation, eicosanoids and Th2 cytokines in an experimental model of allergic rhinitis

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Abstract

Allergic rhinitis (AR) is an inflammatory disorder of the nasal mucosa, and is a worldwide health problem with a significant impact on the quality of life. The main goal of AR treatment is to relieve symptoms. However, standard treatments have considerable side effects or are not effective. Photobiomodulation (PBM) therapy has emerged as an alternative treatment. Here, we evaluated the effects of transcutaneous systemic (tail) or local (skin over nostrils) PBM using a 660 nm light emitting-diode (LED) array. Adult rats were sensitized with 7 intradermal injections of ovalbumin (OVA) plus alum. After the immunization, a nasal challenge was performed by intranasal instillation of OVA (2%) daily for 7 days. The symptoms and signs of AR were then provoked by intranasal instillation of OVA (1%) daily for 3 days. The animals were treated with PBM (local or systemic) immediately after the last instillation of OVA. Our results showed that local PBM treatment reduced mast cell degranulation in the nasopharynx and nostrils, levels of leukotriene B₄, thromboxane A₂, and interleukin 4 (IL-4) in the nasopharynx, as well as gene expression of IL-4. Moreover, we showed higher levels and gene expression of IL-10 after local PBM treatment. Systemic PBM treatment did not change any of the evaluated parameters. In conclusion, our data showed that local (but not systemic) treatment with PBM could improve parameters related to AR in an animal model, and should be tested clinically.

Recent Publications



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