

INVESTIGACIÓN - ODONTOLOGÍA

EFFECT OF PHOTODYNAMIC THERAPY ON APICAL PERIODONTITIS IN AN EXPERIMENTAL MODEL OF OVALBUMIN (OVA)-INDUCED ASTHMA

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Apical periodontitis (AP) is a chronic infection resulting from pulp necrosis, characterized by destruction of periapical tissues. Asthma is a chronic inflammatory disease of the lower airways, associated with the release of inflammatory mediators. It is known that oral diseases can interfere with pulmonary diseases; therefore, this study evaluated the effects of antimicrobial photodynamic therapy (aPDT) as an adjunct to conventional endodontic treatment in an experimental model of AP associated with asthma. A total of 64 male Balb/C mice were used, divided into 8 groups (n=8): Basal, AP, AP +

Endodontic Treatment (ET), AP + ET + aPDT, Asthma + AP, Asthma + AP + ET, Asthma + AP + ET + aPDT, and Asthma + AP + aPDT. AP was induced by coronal access opening for 21 days. Asthma was induced by ovalbumin (OVA – 4 µg) and aluminum hydroxide (days 0 and 14, subcutaneously), followed by orotracheal challenges with OVA (10 µg) three times per week for 5–6 weeks. Endodontic treatment included mechanical instrumentation, calcium hydroxide application, and aPDT with methylene blue (0.005%) activated by a diode laser (660 nm, 9 J per point, 90 s). The association between AP and asthma increased ($p < 0.05$) and endodontic treatment reduced ($p < 0.05$) cell migration (macrophages, lymphocytes, neutrophils, and eosinophils) to the lungs compared to the asthma group, as well as IL-1 β , IL-4, IL-5, IL-6, IFN- γ , and IL-10 levels, with better results in the groups that received aPDT. Alkaline phosphatase was elevated ($p < 0.05$) in the AP and AP + Asthma groups and reduced ($p < 0.05$) after treatment only in the groups without asthma. It is concluded that AP can worsen pulmonary inflammation in asthmatic individuals, and that aPDT, as an adjuvant, contributes to reducing both local and systemic inflammation.

Palavras-chave: keywords: asthma; pulmonary inflammation; apical periodontitis; low-level laser therapy; photodynamic therapy.