PIPERIDINE NITROXIDE AMELIORATES GINGIVAL OXIDATIVE STRESS AND BONE REMODELING BIOMARKERS ASSOCIATED TO PERIODONTITIS

Bruzadelli, S. R.¹; Swerts, A. A.¹; Santos, T. T. M.¹; Fernandes, L. A.¹; Brigagão, M. R. L.²

¹Faculdade de Odontologia, Universidade Federal de Alfenas, Alfenas, MG, Brazil; ²Instituto de Ciências Biomédicas, Universidade Federal de Alfenas, Alfenas, MG, Brazil.

Periodontitis is an immunoinflammatory reaction in response to periodontopathogenic microorganisms present in the biofilm, which induces resorption of tooth supporting tissues (alveolar bone, cementum and periodontal ligament) and gingival bleeding.

This study focused the effect of oral nitroxide administration on gingival oxidative stress markers and alveolar bone loss associated to periodontitis.

Two different strategies of oral treatment with the nitroxide: preventive or therapeutic, were employed to establish the efficiency of the piperidine compound as an adjuvant to scaling and root planing mechanical treatment. Cotton ligatures were placed around the cervical area of the left mandibular first molars of male rats. Nitroxide Tempol (2mmol/kg/daily) or vehicle alone was orally administrated to animals before or post ligature-induced periodontitis. The animals were subject to mechanical treatment simultaneously to ligature removal. At different experimental periods (7, 15 or 30 days), gingival oxidative markers (reduced glutathione, malondialdehyde and protein carbonyl content) were measured in sample homogenates from animals. Bone loss was assessed by radiographyc assay.

There was a greater increase in gingival oxidative markers and alveolar bone loss due to induced periodontitis. Nitroxide treatment in a preventive manner was more efficient to partially prevent periodontitis-associated events them that therapeutic nitroxide administration after induction of experimental periodontitis.

Oral nitroxide administration showed beneficial effects on periodontal structures during and after induction of experimental periodontitis. Within the limits of this study, it can be concluded that piperidine nitroxide, which is proposed for different inflammatory processes treatment, can also be used as a protective and therapeutic agent for periodontal disease in an adjunctive manner to mechanical non-surgical treatment.

Key words: periodontitis, nitroxide, bone remodeling.

Acknowledgement: CNPq.