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Effects of febuxostat on periodontitis rats

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[Objective] Periodontitis is a chronic inflammatory disease, characterized by oxidative stress and up-regulation of pro inflammatory mediators in gingival tissue. Febuxostat, a xanthine oxidase inhibitor, has been shown to exert an anti-inflammatory and antioxidant effects. The purpose of this study is to evaluate the effects of febuxostat in periodontitis rats. [Methods and Result] Male Wistar rats were divided into three groups: periodontitis group, febuxostat-treated periodontitis group, and sham-operated group. Periodontitis was induced by ligature wire insertion to gingiva around the 2nd maxillary molar and rats were then given drinking water with or without febuxostat (5 mg/kg). After 4 weeks of periodontitis, the maxilla was extracted for morphometric and histological analyses. Pro-inflammatory cytokines levels of interleukin 1β (IL1β) and tumor necrosis factor α (TNF-α) in gingiva were assessed by RT-PCR and immunohistological staining. In rats with periodontitis, ligature placement induced alveolar bone resorption and impaired glucose tolerance. In addition, IL1β and TNF-α mRNA expression in gingiva were significantly increased and these cytokine expression in interstitial cells are increased in periodontitis rats in comparison with sham-operated rats. Febuxostat significantly reduced alveolar bone resorption, blood glucose and the level of pro inflammatory cytokines. [Conclusion] We conclude that febuxostat attenuates periodontitis and related glucose intolerance.