

The possible therapeutic role of ginger extract in the effect of chronic aluminum toxicity on rat periodontium (Histological and Immunohistochemical study)

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Abstract

Background: Chronic aluminum intoxication enhanced the risk for different body tissues in human and animals. Ginger administration may minimize the harmful effects of metal ions toxicity. **Objective:** This study has attempted to assess and compare the effects of chronic aluminum intoxication and concomitant ginger treatment on different structures of rat periodontium. **Methodology:** 21 adult male albino rats were divided into three equal groups: For three months; group I received sterile 0.9% saline/day orally, groups II and III received (20mg/kg/day) aluminum chloride orally in drinking water; then, only group III received (150mg/kg/day) ginger oil extract orally for 4 weeks. Some of dissected mandibular halves were used for bone mineral density (BMD) measure. Other halves were decalcified and processed for H&E and immunohistochemical (using anti-CD68+ and anti-osteopontin antibodies) examination. **Results:** Histopathologically, group II showed apparently decreased periodontal fibers density, wide degenerative areas and marked inflammatory infiltrates. Likewise, CD68+ was significantly expressed in giant cells in periodontal ligament (PDL) and at resorption surfaces of cementum and bone in group II. These changes were improved in group III with a significant decrease of CD68+ positive cells in PDL. Cementum and bone of group II presented significant destructive changes that were mostly restored in group III. Comparing to group I, osteopontin expression in group II significantly increased in acellular cementum (AC) > cellular cementum (CC) > bone > PDL. In comparison, this reactivity was significantly increased in bone > CC > AC in group III while osteopontin expression in PDL was mild but with significant increase comparing to group I. BMD of alveolar bone was highest in group I > group III > group II with significant differences. We concluded that detrimental alterations associated with chronic Al toxicity were markedly detected in PDL > bone > CC > AC that could result in serious clinical outcomes. Ginger extract greatly ameliorated these changes in bone > CC > AC > PDL confirming its strong curative potency against aluminum associated oxidative damage thus it is indicated for use in further new therapeutic approaches.

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