

The influence of *Zingiber officinale* Roscoe on the histological changes of soft palatal mucosa in streptozotocin-induced type 3 diabetes rat model

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Abstract

Background: *Zingiber officinale* Roscoe presents valuable outcomes in some neurodegenerative diseases. **Objective:** This study aimed to evaluate zingiber oil extract efficacy in regression of Type3 diabetes mellitus (T3DM) induced in rat model. **Methodology:** 28 adult male albino rats were divided into four equal groups: Control-ve group received no injections; Control+ve group received a single bilateral intra-cerebroventricular (ICV) injection of sterile 0.9% saline, T3DM group received a single bilateral ICV injection of streptozotocin (3 mg/kg) dissolved in sterile 0.9% saline; Zingiber treated group five weeks after ICV- STZ, received orally 100 mg/kg/day zingiber oil extract for two months. Soft palatal oral mucosal sections were processed for H&E, fluorescence staining (using thioflavin-T dye) and immunohistochemical (using anti-caspase-3 and anti-VEGF antibodies) examination. **Results:** Both control groups were almost identical. Some T3DM sections histopathologically displayed inflammatory signs represented by cloudy swelling of keratinocytes, nuclear degenerative signs, apparently increased apoptotic keratinocytes, subepithelial degeneration, chronic inflammatory infiltrates, congested dilated blood vessels, hyperplasia and dilatation of palatal glandular acini and excretory duct. Irregular and decreased palatal fungiform papillae with few vacuolated taste cells were illustrated. Comparing to control groups, significant strong diffuse thioflavin-T fluorescence in oral epithelium, palatal acini, endothelium of blood vessels along with subepithelial amyloid deposits in some T3DM specimens were detected. Likewise, caspase-3 immunoreactivity in oral epithelial and connective tissue cells significantly increased in T3DM group. Similarly, significant positivity to VEGF in oral epithelium and in the significantly increased blood vessels in wall thickness and distribution were exhibited in T3DM sections. All T3DM results were significantly restored in zingiber group except for the low significant decrease of caspase-3 reactivity in this group. **Conclusions:** It was concluded that zingiber oil extract was an appropriate selected approach to ameliorate the possible T3DM associated peripheral tissue insults but most probably in a higher dose or prolonged supplementation.

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