

*Assessment of Transforming Growth Factor- beta one
(TGF- β 1) immunohistochemical (IHC) expression profile in
the gingival tissue of patients with different forms of
periodontal diseases*

A Thesis

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Abstract

Background: Although periodontal bacteria are the primary cause of periodontal disease, subsequent progression and the severity of the disease are thought to be determined by the host immune responses. Periodontopathic bacteria stimulate cells comprising periodontal tissues to express various inflammatory cytokines such as transforming growth factor beta one TGF-beta1, which exerts powerful pro/anti-inflammatory functions, and is a master regulator of the immune response.

Aims of the study: The purpose of this study was to evaluate the immunohistochemical (IHC) expression profile of TGF- β 1 in inflamed gingival tissue of patients with gingivitis & chronic periodontitis compared to healthy subjects by Immunohistochemical analysis and test the relation between this cytokine with the clinical periodontal parameters, intensity of inflammation and chronic periodontitis severity.

Materials and methods: Gingival tissue specimens were taken from 23 chronic periodontitis patients, 20 gingivitis patients and 20 periodontally clinically healthy subjects. Dichotomous measurement of the following clinical periodontal parameters (plaque index (PLI), gingival index (GI), bleeding on probing (BOP), probing pocket depth (PPD), clinical attachment level (CAL)) were performed once at the initial periodontal examination and the second at the time of periodontal surgery. Measurements were performed at four sites per tooth for whole dentition excluding the 3rd molars. All the patients underwent the 1st phase of periodontal treatment (oral hygiene instruction and motivation, supragingival scaling and root planing). Each patient underwent periodontal surgery, independently of this study, as a part of their routine periodontal treatment. The chronic periodontitis patients were arranged for full-thickness mucoperiosteal flap/debridement and the gingivitis patients with gingival enlargement were arranged for gingivectomy procedure while the healthy subjects underwent crown lengthening procedure, tooth extraction for orthodontic indication or extraction of impacted 3rd molar according to the designated treatment plan. Informed consent was obtained from the patients to collect, preserve and analyze the gingival tissues for this study. Biopsies were obtained from suitable sites from the deepest sites of interproximal pocket at the time of surgeries. The gingival specimens were fixed immediately in 10%

formalin and processed routinely into paraffin blocks for further Immunohistochemical analysis.

Results: A highly significant statistical difference was observed among the study groups regarding the PLI ,GI ,the percentage of bleeding on probing and the intensity of inflammation .TGF- β 1 expression profile statistical analysis showed a high statistical significant difference among the study groups, inter group comparison revealed a highly statistical difference between the control & gingivitis groups and between the control& chronic periodontitis groups while a non significant difference was found between the gingivitis& chronic periodontitis groups . In chronic periodontitis group a highly significant statistical difference was found between the PPD scores while a significant statistical difference was revealed among the CAL scores when the expression profile of TGF- β 1 was compared.TGF- β 1 was positively correlated with the clinical periodontal parameters (PLI, GI, and BOP) as well as with the intensity of inflammation in the three study groups. In chronic periodontitis group a highly significant positive linear correlation between the PPD & CAL with the TGF- β 1 expression profile was found.

Conclusions: The present study revealed that TGF- β 1 expression profile variations as the destructive character of the periodontal disease changed. Therefore, it could be proposed that TGF- β 1 might contribute both to inflammatory regulation and remodeling events during periodontal disease. It is likely that elevated TGF- β 1 levels may represent a contributory role of this cytokine in concert with other mediators in the pathogenesis of severe chronic periodontitis. These findings provide further data for the role of TGF- β 1 in modulating the extent of inflammatory activity in periodontal disease.