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**Assessment of Interleukin-1 β Levels in Gingival
crevicular Fluid and Serum of patients with
Gingivitis and Chronic Periodontitis
(Comparative Study)**

A Thesis

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Abstract

Background

Chronic periodontitis is a bacterially induced inflammatory disease of the soft and hard tissues which support the tooth root. Cytokines are of major importance in periodontal disease progression. Interleukin-1 (IL-1) is a key regulator of the host response and a major modulator of extracellular matrix catabolism and bone resorption. Interleukin-1 β (IL-1 β) is one of the most important cytokines which seems to have an important role in the inflammatory process in periodontal tissue and it has been correlated with periodontal disease destruction. Gingival crevicular fluid is an inflammatory exudate that results from the interaction between the host and dental biofilms. Gingival crevicular volume which is the net result of gingival and periodontal inflammatory exudates, has been used to evaluate the inflammatory status of the gingival and periodontal tissues. Volumetric and compositional alterations in gingival crevicular fluid are widely accepted to be associated with periodontal health/disease and it can be used as biochemical markers in periodontal disease.

Aims of the study

To assess and compare the levels of interleukin-1 β in gingival crevicular fluid and serum in patients with chronic periodontitis, gingivitis and healthy subjects and to determine whether the effect of IL-1 β is related to its local or systemic production.

Subjects and methods

Ninety males were enrolled in the present study. They were divided in to three main groups (50) patients have chronic periodontitis (CP), (25) gingivitis, and (15) healthy control with an age ranging from (35-55) years. The Chronic periodontitis patients were subdivided into 2 subgroups according to the mean of pocket depth : subgroup I (shallow pocket 4-5mm) and subgroup II (deep pocket more than or equal 6 mm). Plaque index, gingival index, bleeding on probing and probing pocket depth were recorded for each subject. Gingival crevicular fluid was collected from each subject by using paper point (size 30) which was inserted into the gingival crevice and kept in place for 30 seconds. The fluid volume was determined by using a Periotron (Harco 6000). Serum samples were also collected by using Serum Separating Tubes).The concentration of interleukin 1 β in gingival crevicular fluid and serum was quantified by a high-sensitivity enzyme linked immunosorbent assay.

Results

The mean volume of gingival crevicular fluid (μl) was found to be higher level in chronic periodontitis group (139.00 ± 39.10) than in gingivitis group (62.28 ± 18.99) and in control group (34.00 ± 11.3).Also,The concentration of crevicular interleukin 1 β ($\text{pg}/\mu\text{l}$) was higher in Chronic periodontitis group (275.61 ± 60.63) than in gingivitis group(174.04 ± 57.09) and in control group (72.96 ± 27.82).In addition, The concentration of serum IL-1 β ($\text{pg}/\mu\text{l}$) was found equal in chronic periodontitis group (193.74 ± 88.14) and gingivitis group (193.44 ± 33.37) while in control group it was (172.20 ± 34.92). Moreover, all the clinical parameters were higher in subgroup II than in subgroup I .and the volume of GCF was found to be higher level in subgroup II than in

subgroup I , the mean \pm S.D. were(141.33 \pm 41.57 ,136.85 \pm 37.38) respectively. The descriptive statistics for serum and crevicular IL-1 β concentration (pg/ μ l) was elevated in subgroup II in comparison with subgroup I.

A high significant difference in the concentration of IL-1 β (pg/ μ I) in GCF compared to serum concentration in chronic periodontitis and control group P-value (0.000 and 0.001) respectively and between the two subgroups. while a significant difference found in Gingivitis group P-value (0.042).

In chronic periodontitis group all clinical parameters have non-significant correlation with the crevicular and serum concentration of IL-1 β .In gingivitis group gingival index has a significant correlation with crevicular concentration of IL-1 β while other clinical periodontal parameters have anon significant correlation even with serum concentration of IL-1 β . Both subgroups exhibit anon significant correlation for their clinical parameters with crevicular and serum concentration of IL-1 β .

Conclusion

The findings of the present study indicated that the volumetric quantification of gingival crevicular fluid is a sensitive method for determining the degree of periodontal inflammation. The concentration of crevicular IL-1 β (pg/ μ l) was higher in Chronic periodontitis group than in gingivitis group and in control group and can be consider as monitor marker which give information about periodontal disease progression. The IL-1 β level in serum was very low in comparison to its level in gingival crevicular fluid, this difference may be due to that IL-1 β is produce locally and acts on the local environment.