INTRODUCTION

The biochemical composition of healthy and diseased periodontal connective tissues is determined by the extension of the degradation and synthesis of matrix components.(1) Degradation is a normal feature of periodontal connective tissues. The gingival cells and those of the periodontal ligament have a higher recovery rate than other tissues, even in adults, a rate which becomes excessive when inflammation is present.

The major change of the biochemical constituents of connective tissue in periodontal disease is the loss of collagen due to its degradation. There are at least four mechanisms by which the extracellular matrix can be degraded and modified during development of marginal periodontitis: chronic enzymes released by the host and bacterial cells, phagocytosis of the matrix components, the synthesis of reactive oxygen species, and the release of a wide range of cytokines and other inflammatory mediators.

The type of matrix metalloproteinase produced by the periodontal ligament cells is influenced by some of the inflammatory mediators.

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The filter paper intended for sampling was placed to the maximum depth of the gingival sulcus and was kept there for 3 minutes. Samples containing traces of blood were discarded. Elution of the absorbed fluid on the filter paper was performed for each sample in 75 μl 50 mM Tris-HCl, pH 7.8, containing 0.2 M NaCl and 1 mM CaCl2 for 2 hours at 22°C under vibration, according to the procedure described by Emingil et al. (2006). GCF eluted samples were frozen at -20°C until the ELISA test. In order to perform the ELISA test, the GCF samples were assessed in a dilution of 1:20.

The determined values (µg/l) of MMP-8 in the GCF were then statistically analyzed by GraphPad InStat software v.3.10. To evaluate the relationship between the clinical entities (healthy, gingivitis, periodontitis) and MMP-8 levels in GCF we used the nonparametric ANOVA Kursk-Wallis test. Differences of p<0.05 were considered statistically significant.

RESULTS

The determined values of MMP-8 in GCF in the three groups investigated are shown in figure no. 1 and table no. 1. The nonparametric ANOVA Kruskal-Wallis test revealed the value p<0.0001, considered extremely significant value, i.e. the change in the mean values in the investigated groups is significantly higher than expected.

We used the Dunn multiple comparison statistical test to determine whether there are statistically significant differences between the studied groups pairs. It was noted that there was a statistically significant difference between the concentration levels of MMP-8 in the GCF in patients with chronic periodontitis and the subjects in the control group (p<0.001). Significant difference was also found in concentrations of MMP-8 in the control and gingivitis groups (p<0.01) (figure no. 2).

DISCUSSIONS

Matrix metalloproteinases are zinc-dependent endopeptidases derived predominantly from polymorphonuclear leukocytes during acute phases of periodontal disease, and are the key enzyme responsible for the degradation of the extracellular matrix collagen. According to the literature, in the course of periodontal disease high levels of MMP were observed, especially of MMP-8 and MMP-9 in inflamed gingival tissue and GCF.(5) MMP-8 has the unique ability to degrade collagen type I and III, critical action for periodontal tissue destruction. MMP-8 levels in GCF have been reported to be higher in periodontal disease compared to those found in healthy subjects, observations confirmed by several studies.(6,7,8,9,10)

Establishing a mechanical treatment of scaling and root planning, associated with anti-inflammatory or antibiotic treatment can reduce the level of MMP-8 in the crevicular fluid and can improve the periodontal clinical parameters.(11,12,13,14,15)

REFERENCES

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