

Detection of salivary flow rate and minerals in smokers and non smokers with chronic periodontitis

(Clinical and Biochemical study)

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Abstract

Background: Chronic periodontitis is an inflammatory disease that affects the supporting tissues of the teeth and it's a common chronic adult condition. Smoking is considering a major risk factor for development and progression of periodontal disease, and it has an effect to the salivary minerals which cooperate with plaque and calculus initiation, maturation, and metabolism with periodontal disease formation.

Aims of the study: The purpose of this study was to evaluate the effect of smoking on the salivary minerals in subjects with chronic periodontitis compared to healthy subjects by biochemical analysis of these minerals which include (Ca^{+2} , Na^{+1} , Mg^{+2} Po4^{-3} and K^{+1}) and to test the relationship between these minerals and the clinical parameters among each group.

Materials and methods: The study group included 75 males—25 males smokers with chronic periodontitis, 25 males non-smokers with chronic periodontitis and 25 males non smokers with healthy periodontium. All with an age rang 30-40 years. Clinical measurements include (PLI, BOP, PPD, CAL) were determined for each tooth except third molar. Unstimulated whole saliva was collected. PH and salivary flow rate were obtained and the levels of five elements—sodium, potassium, calcium, magnesium, and phosphate—in each specimen were analyzed. For each group a statistical analysis was done to estimate the significant relationship of each salivary mineral with the clinical and biochemical parameters.

Results: A highly significant difference in PLI in (chronic periodontitis / smokers) group with a mean value ($=1.232\pm 0.475$) than in (healthy periodontium / non smokers) group with a mean value ($=0.379\pm 0.294$) and a non significant in (chronic periodontitis / smokers) group than (chronic periodontitis / non-smokers) group with a mean value ($= 1.141\pm 0.317$). A highly significant relation of gingival bleeding on probing in (chronic periodontitis / non-smokers) group in compared to (chronic periodontitis / smokers) group with very clearly marked decrease in the

total sites that bleed in smokers than non-smokers. A significant difference in PPD was found between (chronic periodontitis / smokers) group with a mean value ($=4.346\pm0.377$) and (chronic periodontitis / non smokers) group with a mean value ($=3.43\pm2.05$). CAL was significantly differ between (chronic periodontitis / smokers) group with a mean value ($=2.767\pm0.499$) and (chronic periodontitis / non-smokers) group with a mean value ($=2.469\pm0.691$). The results of this study for salivary minerals showed that there were high significant differences between (chronic periodontitis / smokers) group and (chronic periodontitis / non-smokers) group for Ca^{+2} , Na^{+1} and K^{+1} ions and between (chronic periodontitis / smokers) group and (healthy periodontium / non smokers) group for Ca^{+2} , Na^{+1} , K^{+1} and Po4^{-3} ions while significant differences were found in (chronic periodontitis / smokers) group compared with (chronic periodontitis / non-smokers) group and (healthy periodontium / non smokers) group for Mg^{+2} ion. Salivary flow rate was significantly higher in (chronic periodontitis / smokers) group with a mean value ($=0.792\pm0.243$) compared with (chronic periodontitis / non-smokers) group with a mean value ($= 0.418 \pm 0.135$) and (healthy periodontium / non smokers) group with a mean value ($= 0.416 \pm 0.195$). A significant increase in PH level in (chronic periodontitis / smokers) group with a mean value ($= 7.705 \pm 0.299$) compared to (healthy periodontium / non smokers) group with a mean value ($=7.257 \pm 0.550$) and a non significant difference in (chronic periodontitis / smokers) group compared to (chronic periodontitis / non smokers) group with a mean value ($= 7.570\pm 0.501$). In (chronic periodontitis / smokers) group, there was a significant positive correlation between the mean level of Ca^{+2} and PLI. There was also a significant negative correlation between the mean level of Po4^{-3} and CAL. In (chronic periodontitis / non smokers) group, there was a high significant negative correlation between the mean level of Mg^{+2} ion and PLI.

Conclusions: The researcher could conclude that monitoring for changes in salivary composition might be a useful tool to detect the effect of smoking on periodontal health status.