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Salivary Oxidative Status in Relation to Periodontal Health Condition among Workers in Department of Medical Diagnostic Radiology: Comparative Study

A Thesis

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Abstract

Background: Workers in diagnostic radiation field are at higher risk for systemic diseases as well as oral diseases like periodontal diseases due to changes in oxidative status caused by ionizing radiation.

Aims of study: This study was conducted to estimate the salivary oxidative stress marker, antioxidants and flow rate in relation to periodontal status (plaque index, gingival index, periodontal pocket depth and clinical attachment loss) among a group of diagnostic radiation workers in comparison with control group.

Subjects, materials and methods: The total sample for this study included 80 men aged 30-40 years worked in Baghdad hospitals. The study group consisted of 40 men working in computed tomography for 5-10 years and the control group consisted of 40 men working as nurses or at laboratory away from radiation. Collection of unstimulated salivary samples was carried out under standardized conditions. Plaque index, gingival index, periodontal pocket depth index and clinical attachment loss index were used for recording the periodontal status. Salivary flow rate was measured then salivary analysis was done to determine the level of salivary antioxidants (zinc, copper and manganese) and oxidative stress marker (protein carbonyl).

Results: Data analysis of the present study reported that salivary protein carbonyl, salivary copper and manganese were higher among radiographers than control group with statistically highly significant difference ($P<0.01$), while salivary zinc and salivary flow rate were lower among radiographers than control group with statistically highly significant difference ($P<0.01$). Concerning clinical parameters, the present study reported that plaque and gingival indices; although not significant statistically ($P>0.01$) they were higher among radiographers (1.130 ± 0.048 ; 0.876 ± 0.088) than among control group (1.069 ± 0.024 ; 0.829 ± 0.112) respectively; on the other hand, periodontal pocket

depth and clinical attachment loss were higher among radiographers (3.340±0.295 ; 1.614±0.190) than control group (0.613± 0.234 ; 0.293±0.119) respectively with statistically highly significant difference ($P<0.01$)

Although no significant correlation was recorded ($P>0.05$), but negative correlations were detected in study group between salivary flow rate with plaque index and between salivary flow rate with gingival index. Negative correlations were detected also between salivary flow rate with periodontal pocket depth and with clinical attachment loss in both study and control groups. On the other hand positive correlation between salivary flow rate with plaque index and between salivary flow rate with gingival index in control group. Moreover, negative correlations were detected in study group between salivary flow rate with zinc, copper and manganese and between salivary protein carbonyl with zinc and manganese. Also negative correlations among radiographers were found between plaque index with zinc and copper and between gingival index with zinc, copper and manganese.

Conclusions: Ionizing radiation affects salivary antioxidant, oxidative stress marker (protein carbonyl) and salivary flow rate and these in turn will affect periodontal status.