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Oral Health Status Related to Selected Salivary Physiochemical Characteristics Among Groups of Confectionary Workers in Karbala City/Iraq

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Abstract

Background: The work's environment has a direct effect on health as general and on oral and dental health as specific. Confectionary industry deals primarily with sugar and flour which may affect the oral health status of workers in this industry.

Aim of study: This study was conducted to assess and compare oral health status as well as selected salivary physical properties and minerals contents of confectionary workers in comparison with control group of workers in an environment not concerned with sugar or flour.

Materials and methods: The study groups consisted of 90 male workers with an age range of 21-40 years, who worked in confectionary and bakery in Karbala city. They were divided into three groups according to the production line: sweets, biscuit and bakery, 30 workers each group. A matching group (age, gender, work hours) of 30 workers in non-production lines in the same factories were selected as a control. Dental caries was recorded by using DMFS index of WHO, 1987, and severity of carious lesion was recorded through the application of D₁₋₄ MFS index of Manji et al 1989. Plaque index of Silness and Loe, 1964, calculus index of Ramfjord, 1959 and gingival index of Loe and Silness, 1967 were used for recording oral hygiene status. Stimulated salivary samples were collected under standardized conditions to measure saliva viscosity, pH and flow rate. Then chemical analysis was done to detect the concentrations of salivary calcium, phosphorous, copper, zinc and magnesium.

Results: The percentage of dental caries occurrence was 100% among study and control groups. Caries experience (DMFS) was higher in biscuit group followed by sweets, bakery and control groups with statistically highly significant differences ($p < 0.01$) between control and each of sweets and biscuit groups.




For plaque index, higher values were recorded in biscuit group followed by bakery, sweets and control groups, and for calculus index, the bakery group showed higher values followed by sweets, biscuit and control groups, with the differences were statistically non-significant ($p>0.05$) among all groups. While for the gingival index, the values were higher in biscuit group than sweets group, with statistically significant differences ($p<0.05$), and higher than control group, with statistically highly significant differences ($p<0.01$). However, the differences were statistically non-significant ($p>0.05$) among the other groups.

For salivary physical properties, the flow rate and pH were higher in control group than study groups with statistically significant ($p<0.05$) and highly significant ($p<0.01$) differences respectively, while salivary viscosity was higher in biscuit group than other groups with highly significant difference ($p<0.01$).

About salivary constituents, calcium ion concentration was higher in control group with statistically non-significant difference ($p>0.05$). Inorganic phosphorous, zinc and magnesium were higher in biscuit group than other groups with the differences were statistically non-significant ($p>0.05$) for phosphorous and magnesium, but highly significant ($p<0.01$) for zinc. Copper concentration was higher in sweets group than other groups with statistically non-significant difference ($p>0.05$).

Non-significant negative correlation between calcium and caries experience was noticed in control and study groups, but other elements showed negative significant correlations in control group except for copper which showed positive correlation, while in study groups all elements showed significant ($p<0.05$) and highly significant ($p<0.01$) correlations with caries experience except for inorganic phosphorous there was non-significant ($p>0.05$) correlation.



There were non-significant correlations of caries experience with salivary viscosity and flow rate for all groups, while there were significant ($p<0.05$) and highly significant ($p<0.01$) correlations of pH with dental caries in control and study groups.

Generally oral hygiene status showed significant correlations with saliva physical properties and salivary constituents in control and study groups except for zinc which showed non-significant correlation in all groups

All salivary constituents showed non-significant correlations with salivary physical properties in study groups except copper which had significant correlation. All elements showed significant correlations with salivary physical properties in control group except copper and magnesium were non-significantly correlated.

Conclusion: The results of this study showed that confectionery workers had higher levels of caries experience, gingivitis, dental plaque and calculus than the workers in the control group. It was assumed that these findings were attributed to closer exposure to sugar and flour dust in addition to the low education level and lower awareness regarding the significance of oral health and oral hygiene habits. Preventive measures should be based on the reduction of sugar dust in the workplaces as well as educating the workers about the importance of oral hygiene measures and the regular dental visits.