Salivary Antioxidants and Physicochemical Characteristics Related to Oral Health Status among a Group of Old Adults.

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Abstract

Background: Old adults are regarded as an important target group with special oral health needs. Salivary gland structure and saliva composition particularly the antioxidants are subjected to significant changes with advancing age. This will adversely affects oral health status.

Aims of the study: The aims of this study were to assess salivary antioxidants and lipid peroxidation biomarker (MDA) levels in addition to salivary physicochemical characteristics and their effect on dental caries and periodontal diseases among old adults in comparison with middle-aged.

Materials and Methods: The study group consisted of all old adults (35 subjects) aged 55-65 years in comparison with all middle-aged adults (35 subjects) aged 30-40 years at the Textile factory in Mosul city who fitted the criteria of the study. Dental caries was recorded by lesion severity through the application of D_{1-4} MFS index (Mühlemman, 1976). Plaque index (Silness and Löe, 1964) and calculus index (Ramfjord, 1959) were used for recording oral cleanliness. Periodontal disease was evaluated by using the gingival index (Löe and Silness, 1963), periodontal pocket depth (Carranza, 1996) and clinical attachment level (Ramfjord, 1959). Unstimulated salivary samples were collected (Tenovuo and Lagerlöf, 1994) and salivary flow rate and pH were determined. Salivary samples then were chemically analyzed for the detection of salivary antioxidants (Total protein, albumin, vitamin E, vitamin C and uric acid) and lipid peroxidation biomarker (Malondialdehyde/MDA) in addition to salivary constituents as urea, calcium, phosphorous and magnesium.

Results: Antioxidants level (Total protein, albumin, vitamin E, and vitamin C) were lower among old adults compared to middle-aged ones with significant difference for vitamin C only; whereas uric acid showed higher value among old adults with no significant difference. Malondialdehyde was slightly higher among old adults with no significant difference. Statistically no significant difference could be found regarding salivary flow rate and pH between the two age groups. Also salivary constituents (urea, calcium, phosphorous and magnesium) showed no significant difference between the two age groups.

The percentage of dental caries occurrence was 100% among old adults and middle-aged. Caries experience (DMFS) was highly significantly higher among old adults (28.71±9.15) compared with middle-aged (20.68±8.53). The percentage of root caries occurrence among old adults and middle-aged was 11.43% and 4.28% respectively. Mean decayed root surface was higher among old adults (0.28±0.57) than middle aged (0.17±0.57) but with no significant difference. Salivary antioxidants showed a significant correlation and ß coefficient slop on dental caries (coronal and root caries) with positive direction for total protein, vitamin C and uric acid but inverse one for albumin and vitamin E among old adults and middle-aged. Lipid peroxidation (MDA) showed inverse correlation with initial caries (D_1 and D_2) that changed to positive direction with frank cavitation (D_3 and D_4) among old adults. Generally salivary physicochemical characteristics recorded significant correlation and ß coefficient on dental caries (coronal and root caries) that was in inverse direction except for magnesium that revealed positive correlation and ß coefficient on coronal caries but inverse correlation and ß coefficient on root caries among old adults and middle-aged.

The percentage of gingivitis occurrence among old adults and middle-aged was 100%. No cases with severe gingivitis could be found in both age groups. Both mean plaque and gingival indices were highly significantly higher among old adults. The occurrence and extent of pocket depth were higher among old adults at ≥4 and ≥5 mm thresholds but ≥7 mm threshold was absent among them. However, no significant difference was recorded in mean pocket depth between the two age groups. Clinical attachment level occurrence and extent were higher among old adults at all thresholds of severity. Also mean attachment level was highly significantly higher among them. Salivary antioxidants showed significant correlation and ß coefficient on periodontal disease with positive direction for vitamins E and C but inverse one for albumin and uric acid among old adults and middle-aged. Lipid peroxidation (MDA) showed positive highly significant ß coefficient on mean attachment level with positive highly significant correlation with ≥9 mm attachment level threshold among old adults. Generally salivary physicochemical characteristics

showed significant correlation and ß coefficient on periodontal disease indicators that was in inverse direction among old adults and middle-aged.

Conclusions: Dental caries and periodontal disease revealed higher percentage of occurrence and severity among old adults therefore special oral health preventive and educational programs are needed for them. Salivary antioxidants and physicochemical characteristics were found to affect oral health among old adults.