Oral Health Status In Relation to Nutritional Analysis and Salivary Constituents among a Group of Children with Down's Syndrome, In Comparison to Normal Children

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Abstract

Background: Down's syndrome is a genetic disease resulting from trisomy the twenty-first chromosome. Numerous functional and physical disorders associated with this syndrome. An alteration in salivary constituents of Down's syndrome children may affect dental caries and gingival health either in positive or negative direction. This study was conducted concerning special children with Down's syndrome, in mentally retarded institutions aged from 7-10 years in Baghdad city.

Aims of The Study: The purpose of this study was to investigate the oral health status of 50 children with Down's syndrome (study group) in relation to nutritional analysis and salivary variables and to compare results with 50 normal healthy primary school children (control group).

Materials and Methods: Decayed, missing and filled surfaces index ($d_{1-4}mfs/D_{1-4}MFS$) was used for detection of caries – experience by lesion severity for primary and permanent teeth according to classification of Muhlemann (1976), while for dental plaque, calculus and gingival health condition the following indices were used; Silness and Löe (1964), Ramfjord (1959) and Löe and Silness (1963) respectively. Teeth presence and erupted as well as enamel anomalies were diagnosed and recorded following the criteria of WHO (1987) and (1997) respectively. Stimulated salivary samples were collected and chemically analyzed to determine the concentrations of the following constituents: Ions of calcium, phosphorus, sodium, potassium, magnesium, copper, zinc as well as salivary immunoglobulins (IgA, IgG) and urea. Salivary flow rate, pH in addition to buffer capacity effect was determined. The assessment of nutritional status was performed by using anthropometric measurement (height, weight and body mass index) following the 2000 Centers for Disease Control and Prevention growth chart (CDC), while the nutrient analysis was done through dietary assessment using food frequency

questionnaires**,** the assessment was converted to nutrient data by using software program designed by Diab (2003).

Results: Results showed that 10% of study group was caries free compared to 4% in the control group. The mean values of caries – experience of primary and permanent teeth were lower among the study group (4.92 ± 6.32, 0.46 ± 0.81 respectively) compared to control group (9.22 ± 6.93, 1.18 ± 1.61) with statistically highly significant differences ($P< 0.001$).

It has been noticed that the median count of primary teeth present was higher among the study group compared to the control group with no statistically significant difference, while the median count of erupted permanent teeth was lower among the study group compared to the control group with statistically significant difference ($P< 0.05$).

Results revealed that a higher percentage of children with enamel anomalies were recorded among the study group 20%, compared to 8% in the control group. Demarcated opacities were the most distributed type of enamel anomalies in permanent teeth of the study group while diffuse opacities were the most distributed type among the control group.

The mean value of plaque index was noticed to be higher among study group (1.10 ± 0.32) compared to control group (0.99 ± 0.38) with no statistically significant difference. Results showed the highest level of gingival index was among the study group (1.27 ± 0.29) compared to the control group (0.90 ± 0.43) with statistically highly significant difference ($P< 0.001$). Results revealed that 100% of children were affected by gingivitis among study and control groups.

Results showed a higher value of buffer capacity among study group (4.98 ± 0.86) compared to control group (4.50 ± 0.65) with statistically highly significant difference. Salivary flow rate was observed to be lower among study group (0.47 ± 0.08 ml/min) compared to control group (0.92

± 0.65 ml/min) with statistically highly significant difference (P< 0.001). Higher concentrations of salivary calcium, urea, sodium, potassium and zinc among study group compared to control group with statistically highly significant differences concerning urea, sodium and potassium. While salivary phosphorus, magnesium and copper concentrations were noticed to be lower among study group compared to control group with no significant differences.

Higher concentrations of salivary immunoglobulins IgA (113.75 ± 25.80 ppm) and IgG (110.60 ± 23.09 ppm) were recorded among the study group compared to the control group (IgA: 48.18 ± 7.65 ppm; IgG: 40.90 ± 4.72 ppm) with statistically highly significant differences. Result of multiple linear regression showed that independent salivary variables had an impact on dependent variables (dmfs, DMFS) by 79%, 19% respectively, while on gingival index it was 54%.

Results demonstrated a percentage of stunting children (< -2 SD) 30% among study group compared to control group (8%). Most of children among study and control groups were found with normal weight for age. A higher mean value of body mass index for age among the study group was seen (1.35 ± 0.85) compared to the control group (0.47 ± 1.08) with statistically highly significant difference.

The mean values of caries – experience of primary and permanent teeth were observed to be lower among well nourished children (concerning height for age and weight for age) than stunted and underweighted children in study and control groups. The median count of primary teeth was recorded to be lower among well nourished children than stunted and underweighted children in both groups, while higher median count of permanent teeth was recorded among well nourished children than stunted and underweighted children in both groups. The mean percentage of primary and permanent teeth with enamel anomalies

were found to be higher among well nourished children compared to stunted and underweighted children in both groups. The mean values of gingival index were lower among well nourished children compared to stunted and underweighted children in both groups. Most of salivary parameters and constituents were recorded to be of lower mean values in stunted and underweighted children than well nourished children in study and control groups.

Most of daily nutrients intake were found to be of lower mean values among the study group than the control group. While it was noticed that a higher amount of calcium and vitamin C were consumed among the study group compared to the control group with highly significant difference for vitamin C. The mean values of all nutrients were found higher in well nourished children than stunted and underweighted children, differences were statistically significant and highly significant for most of nutrients in both groups.