

**Republic of Iraq
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College of Dentistry**



Oral Health Status and Selected Salivary Biomarkers among a Group of Children with Nutritional Rickets

A Thesis

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Abstract

Background: Rickets is a disorder condition caused by a lack of vitamin D, calcium or phosphate. Vitamin D and calcium deficiencies are common worldwide, causing nutritional rickets which have a major impact on health, growth, and development of infants and children. It leads to softening and weakening of the bones. Dental manifestation of rickets includes dental caries experience, enamel hypoplasia and delayed tooth eruption.

Aims of the study: To assess the dental health, nutritional status and selected salivary biomarkers (vitamin D, Calcium, phosphate and alkaline phosphatase) among a group of children with nutritional rickets and their mothers in comparison with healthy children and their mothers.

Subjects, materials and methods: A case-control study was conducted, one hundred twenty subjects (60 children with age ranged 1.6-3.6 years and their 60 mothers), 30 pediatric subjects of them with rickets as reported and diagnosed with vitamin D deficiency rickets (VDD) . In addition 30 children and their mothers were enrolled in this study as a control group matching in the age and gender to the study group. Stimulated salivary sample was collected under standardized conditions from all subjects (children and mothers) to be chemically analyzed to evaluate vitamin D, Ca, and PO_4 , in addition to ALP levels. Oral health condition was examined and recorded for the study and control groups by estimating dmfs for children, DMFS for mothers WHO (1987) and enamel defect (WHO, 1997). Height and weight were measured for children and body mass index (BMI) for their mothers in addition, recording feeding types and area of residency was recorded.

Results: mean values of caries experience represented by dmfs and DMFS were higher among control group compared to study group.

The mean values of salivary Ca in children of study group was slightly more than control group as well as ALP concentration, but PO₄ concentration in control group was higher than study group with a high significant difference. While the mean values of PO₄ and ALP was higher among mothers of study group when compared with control group with high significant difference, and less calcium level among study group with highly significance differences. In addition, salivary vitamin D concentration among children was lower among study group compared to control group.

The percentage of children with enamel defect score 0 was higher in control group than in the study group. A higher percentage of the study group affected with enamel defects cited under score 1 followed by score 2 and score 3 when compared with control group.

Concerning the weight status in study and control groups, the children with median weight has a very high percentage in control group, however, the present study failed to record any % of children in study group with median weight (0%).

The distribution of study and control groups according to the area of residency revealed that the study group whose living in urban area was lower than children of control group.

The feeding types, breast feeding percentage is higher in study group when compared to control group. Concerning bottle feeding the result was different, which was higher in control group when compared to study group. Regarding mixed feeding type the percentage in healthy children was recorded a high percentage when compared to nutritional rickets children.

Conclusions: dental health and nutritional status of children with nutritional rickets are very affected by the disease, therefor a specific preventive measures should be applied to ensure good oral health.