

Dental Calculus and Calcium Renal Stone in Relation to Some
Salivary and Urinary Physical Properties and Constituents on Group
of Patients Attending the Specialized Surgeries Hospital in Baghdad

A thesis

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Abstract

Background: Dental calculus is a form of calcification process that occur in the oral cavity and due to its similar structural composition with calcium renal stone, so dental calculus formation may increase in those patients with calcium renal stone with other oral manifestations that may increase also such as periodontal diseases.

Aims of the study: To study if there is a relation between dental calculus accumulation with calcium renal stone formation and if that renal stone had impact on dental plaque and gingival health status by investigating the relations of oral hygiene and gingival health status with salivary and urinary physical properties and constituents then comparing the results with those of healthy looking subjects.

Materials and Methods: Thirty patients with idiopathic calcium renal stone (15 females and 15 males) were selected as study group with an age range (25-30) years old and 30 gender and age matched healthy looking persons were selected as control. Plaque Index of Silness and Loe (1964) and Calculus Index component of the Simplified Oral Hygiene Index of Green and Vermillion (1964) were recorded the oral cleanliness for both groups in addition to gingival health status that were evaluated by using Gingival Index of Loe and Silness (1963). Stimulated salivary samples (Tenovuo and Lagerlof, 1996) in addition to urinary samples (Jawalekar et al, 2010) were collected and the following variables were recorded: salivary pH (potential of hydrogen), buffer capacity of saliva and urinary pH. Salivary and urinary samples then were chemically analyzed to determine the concentrations of salivary and urinary calcium, phosphorus, magnesium in addition to urinary creatinine.

Results: The level of salivary calcium and phosphorus (mmol/L) were higher among study group but with high significant difference only for phosphorus among study group (4.01 ± 0.63) compared to control one (2.96 ± 1.00) while the level of salivary magnesium (mmol/L) was lower among study group (0.24 ± 0.06) with high significant difference compared to control one (0.51 ± 0.09). Urinary (calcium and phosphorus)/creatinine ratios (mmol/g) recorded higher among study group but also with high significant difference only for phosphorus/creatinine ratio among study group (14.18 ± 1.89) compared to control one (12.03 ± 2.67) while for urinary

magnesium/creatinine ratio (mmol/g) it was lower among study group (1.29 ± 0.33) with high significant difference compared to control one (2.80 ± 0.83). Higher level of salivary pH recorded among study group (7.32 ± 0.28) with high significant difference compared to control one (6.90 ± 0.41) while for urinary pH, there was no significant difference between the two groups with the lower value recorded among study group. The buffer capacity of saliva was higher among study group (5.24 ± 0.75) with statistically high significant difference than control group (4.04 ± 0.89); statistically a positive significant correlation was recorded among study group between buffer capacity of saliva with salivary calcium.

The means values of Plaque and Calculus Indices were highly significantly higher among study group (1.46 ± 0.26 ; 0.34 ± 0.13 , respectively) compared to control one (0.78 ± 0.35 ; 0.08 ± 0.06 , respectively) with a positive high significant correlation was recorded between them among study group; in addition to that, higher value of Gingival Index recorded among study group (1.16 ± 0.16) with high significant difference compared to control one (0.73 ± 0.28). No significant correlations were recorded among both study and control groups between Plaque, Calculus and Gingival Indices with salivary calcium, phosphorus and magnesium in all directions while positive significant correlations were recorded among study group between urinary calcium/creatinine ratio with Plaque and Calculus indices, positive high significant correlation between urinary phosphorus/creatinine ratio with Calculus Index while it was a negative significant in relation with urinary magnesium/creatinine ratio. In addition to these significances concerning Calculus Index, there was also a positive significant correlation which recorded among study group between salivary pH with Calculus Index.

Conclusions: Presence of significant correlations between dental calculus accumulation with calcium renal stone formation with higher values of Plaque, Calculus and Gingival Indices scores were recorded among calcium renal stone's patients compared to healthy individuals, so special oral health preventive programs are needed for those patients. Furthermore, it was found that salivary magnesium concentration may be used as an indicator of susceptibility to calcium renal stone.