

# **Correlation between biochemical analysis and periodontal health status and tooth loss in chronic renal failure patients**

A thesis Submitted to the council of the college of Dentistry at  
University of Baghdad in partial fulfillment of the  
requirement for the degree of the Master in Science of  
Periodontics.

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B.D.S. M.Sc. Ph.D.

2012

## **Abstract**

**Background:** Periodontal disease is a chronic bacterial infection that affects the gingiva and bone supporting the teeth. Gingival health is also affected by other factors like smoking, genetics, pregnancy, systemic diseases and others.

The chronic renal failure is one of the serious systemic diseases. It causes general systemic changes which reflect themselves on the oral cavity components. Recent works has been directed toward the salivary changes associated with this general systemic disturbance.

C-reactive protein (CRP) is an acute phase protein produced by liver. Serum CRP measurement is widely used as a bio-marker of inflammation in the body.

**Aim of the study:** To evaluate the periodontal health status and tooth loss in chronic renal failure (CRF) patients under hemodialysis and to evaluate the levels of CRP and albumin in saliva and serum and compared with healthy individuals. Also to correlate the clinical parameters of periodontal health with the biochemical findings of CRF patients.

**Material and method:** Sample population consisted of 100 participants, the samples were divided to study group (73 CRF patients under hemodialysis) and control group (27 healthy subjects). Males and females were included with age range 45-55 years old. The study group divided into two subgroups; hepatitis +ve and hepatitis –ve patients.

The control group include healthy males and females without any history of any systemic disease.

Periodontal health status was determined by testing the following clinical parameters, Plaque index (pI), Gingival index (GI), Bleeding on probing (BOP), Probing pocket depth (PPD), Clinical attachment level (CAL), Mobility index (MI) and missing teeth (MT).

Serum and saliva were collected from both healthy individuals and patients who were under hemodialysis. Un-stimulated saliva was collected before the clinical examination and after taking the non-heparinated blood sample. After centrifusion, serum and saliva samples were kept frozen at -20°C. Micro-albumin Human kit used for salivary albumin determination and Albumin liquicolor Human kit used for serum albumin determination. While Huma-Tex CRP Human kit used for semi-quantitative determination of CRP in serum and saliva.

**Result:** The result showed that the means of all clinical parameters was higher in the study group than in the control group with highly significant differences. Also, the clinical parameters means were higher in hepatitis +ve patients than hepatitis -ve ones with highly significant differences, except for teeth loss there was significant difference, and for (3-5) level of clinical attachment loss there was a non-significant difference.

When comparing males and females, non-significant differences were found for all clinical parameters, except for (3-5) pocket depth there was a significant difference, for ( $\geq 6$ ) pocket depth there was a highly significant difference, and a significant difference for (3-5) level of attachment loss.

When measuring albumin in saliva and serum, the means of their concentration were higher for both in study group than in control group.

Highly significant differences between study and control groups for both saliva and serum. Non-significant differences obtained when males and females were compared. When comparing between hepatitis +ve and -ve patients, a significant difference was found between them for saliva and a non-significant difference was revealed between them for serum.

The CRP means in saliva and serum were higher in study group than in control group. Non-significant difference between males and females for salivary and serum CRP for the study group and a highly significant difference revealed between hepatitis +ve and -ve subgroups for serum CRP.

By using Pearson's Correlation Coefficient, a few clinical parameters shows a significant correlation with the biochemical parameters in the study group. However, some results showed numerical values that should be studied carefully since it could have a clinical significance.

**Conclusion:** There was a weak correlation between clinical parameters and biochemical parameters. CRF patients have higher periodontal parameters and higher number of missing teeth and higher levels of CRP in saliva and serum and higher levels of salivary albumin with lower serum albumin levels as compared with healthy individuals.