

Ministry of Higher Education  
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# **Oral findings, IgA, IL-6, CRP and kidney function markers in saliva of patients with chronic kidney disease**

A thesis

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# Abstract

## Background

Chronic kidney disease is a gradual loss of kidney function over a period of months or years with diabetes and hypertension as the leading cause. Chronic kidney disease is divided into five stages. The last stage is named end stage renal disease which is become fatal in the absence of replacement therapy.

The chronic inflammation observed in chronic kidney disease is associated with increased serum levels of acute-phase protein reactants, such as C-reactive protein, and a variety of immune-inflammatory mediators, such as cytokines. Interleukin-1, interleukin-6 and tumor necrosis factor  $\alpha$  are among the proinflammatory cytokines that have been related to the pathophysiology of kidney disease. There is an evidence of immune activation at the early stages of chronic kidney disease in the adult people. An association between the levels of C-reactive protein and proinflammatory cytokines, particularly Interleukin-6, has also been detected.

Chronic kidney disease is one of the systemic diseases that can affect the salivary content. Saliva can indicate creatinine and urea levels in chronic kidney disease patients which are the parameters generally measured in blood samples.

## Aims of the study

This study aim to determine the oral findings, salivary flow rate, salivary PH and to study of Immunoglobulin A, Interleukin-6, C- reactive protein and kidney function markers (creatinine and urea) in saliva of patients with chronic kidney disease on hemodialysis, those on conservative treatment and compared with control subjects.

## **Subjects, materials and methods**

Ninety subjects were included in this study, divided into three groups: 30 patients with chronic kidney disease on hemodialysis for at least 6 months ago; 30 patients with chronic kidney disease on conservative treatment and 30 healthy control participants. Oral examination was done for each participant with the oral manifestations were recorded. Saliva was collected and salivary flow rate was calculated milliliters per minutes and pH was measured by digital pH meter.

Secretory Immunoglobulin A, Interleukin-6 and C- reactive protein in saliva samples was measured by enzyme linked immunosorbent assay ELISA.

Creatinine level was estimated in saliva samples by colorimetric method. And salivary urea level was measured by Roche - Cobas C 111 analyzer automatically.

## **Results**

Dry mouth, uremic fetor and taste change were the most common oral findings in chronic kidney disease patients on hemodialysis and on conservative treatment. Pale oral mucosa, aphthus ulceration, gingival enlargement, burning sensation and angular cheilitis also seen. No significant differences were found in oral manifestations between the two patients groups.

Salivary flow rate was lower in both patients groups compared to control subjects. Regarding salivary PH, a significant higher salivary PH in both chronic kidney disease patients on hemodialysis and on conservative treatment compared to control subjects.

Salivary immunoglobulin A level was higher in both chronic kidney disease patients on hemodialysis and those on conservative treatment compared to control subjects, although statistically non-significant.

There was a significant increase in salivary Interleukin-6 and C-reactive protein in both patients groups compared to control group. A significant positive correlation was found between salivary Interleukin-6 and C-reactive protein in chronic kidney disease patients on hemodialysis ( $r= 0.781, p=0.00$ ), those on conservative treatment ( $r= 0.840, p= 0.00$ ) and in control group ( $r= 0.816, p= 0.00$ ).

Also, there was a significant increase in salivary creatinine and urea levels in both chronic kidney disease patients on hemodialysis and those on conservative treatment compared to control group. Regarding to serum creatinine and urea level, no significant difference was seen between the two patients groups. A significant positive correlation between salivary creatinine and serum creatinine in chronic kidney disease patients on hemodialysis ( $r= 0.770, p= 0.00$ ) and those on conservative treatment ( $r= 0.932, p= 0.00$ ). Also, a significant positive correlation between salivary urea and blood urea in chronic kidney disease patients on hemodialysis ( $r= 0.860, p= 0.00$ ) and those on conservative treatment ( $r= 0.858, p= 0.00$ ).

## **Conclusions**

Oral manifestations are common in chronic kidney disease patients. Salivary flow rate is lower in chronic kidney disease patients compared to control subjects. Salivary PH, immunoglobulin A, Interleukin-6, C-reactive protein, creatinine and urea levels is higher in chronic kidney disease patients compared to control subjects.