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## Assessment of periodontal health of patients undergoing renal dialysis

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### Abstract

**Background:** Recently, several studies have been published in the literature, providing evidence for an increased prevalence of periodontal disease in patients with renal disease, especially in dialysis patients and renal transplant recipients.

**Aim:** To assess the periodontal health of patients undergoing renal dialysis.

**Materials and method:** The study was conducted by the Department of community dentistry of the dental institution. An interview and oral examination of the patients was conducted. From the medical records of the patient, we recovered patient's medical history, history of renal disease along with type of renal disease, and duration of renal dialysis. WHO Oral Health Assessment form (1997) was followed while conducting oral examination.

**Results:** A total of 91 patients were included in the study. The mean age of the patients was  $41.22 \pm 5.66$  years. Maximum patients ( $n=20$ ) were seen in the age group 50-59 years followed by 60-69 years ( $n=18$ ). In the group of patients with duration of dialysis up to 2 years, maximum patients were seen in age group 60-69 years ( $n=13$ ). In the group of patients with duration of dialysis up to 2 years, CPIN code 3 was more commonly seen ( $n=19$ ). In the group of patients with duration of dialysis more than 2 years, CPIN code 3 was more commonly seen ( $n=10$ ).

**Conclusion:** There is dire need for dental practitioners to treat patients with complex medical conditions to protect the natural dentition of these patients.

**Keywords:** periodontal health, renal dialysis, renal failure

### Introduction

Chronic renal failure is a progressive and reversible decline in the total number of functioning nephrons, resulting in a decline in the glomerular filtration rate [1]. It presents in a myriad of ways and stages from chronic renal insufficiency to uremic syndrome. Kidney disease is one of the leading health problems in the world. But fortunately, modern medicine and research have helped in extending the life expectancy of this patient population [2, 3]. The treatment alternative: artificial filtration of blood by means of dialysis has dramatically prolonged the life and saving or maintaining the majority of patients who previously were destined to die of kidney-related diseases [4]. Recently, several studies have been published in the literature, providing evidence for an increased prevalence of periodontal disease in patients with renal disease, especially in dialysis patients and renal transplant recipients [3-9]. End stage renal disease has been shown to affect not only general health of the patient but also oral and periodontal health.

Literature on research has shown that the number of patients undergoing dialysis is increasing rapidly and these patients frequently complain of number of symptoms related to oral cavity. Such findings are: Uremic stomatitis, insidious oral bleeding, xerostomia, high salivary urea, increased calculus deposition, increased incidence of gingivitis, periodontitis, and secondary renal hyperparathyroidism [7-9]. Hence, the present study was planned to assess the periodontal health of patients undergoing renal dialysis.

### Materials and Methods

The study was conducted by the Department of community dentistry of the dental institution. The ethical clearance for the study was obtained from ethical board of the institute. The renal failure patients undergoing dialysis were selected from the dialysis department of local government hospital. An interview and oral examination of the patients was conducted.

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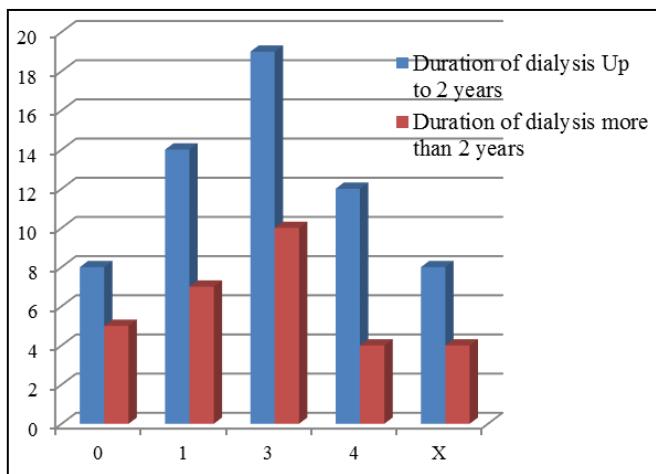
From the medical records of the patient, we recovered patient's medical history, history of renal disease along with type of renal disease, and duration of renal dialysis.

WHO Oral Health Assessment form (1997) was followed while conducting oral examination. The patients were grouped into 2 groups on the basis of duration of renal dialysis, patients getting dialysis for two years and patients getting dialysis for more than 2 years. The findings were tabulated and analysed.

The statistical analysis of the data was done using SPSS software version 20.0 for windows. Student's t-test and Chi-square test were used for checking the statistical significance of the data. A p-value <0.05 was predefined to be statistically significant.

## Results

A total of 91 patients were included in the study. The mean age of the patients was  $41.22 \pm 5.66$  years. Table 1 shows the distribution of dialysis patients based on age-groups. Maximum patients ( $n=20$ ) were seen in the age group 50-59 years followed by 60-69 years ( $n=18$ ). In the group of patients with duration of dialysis up to 2 years, maximum patients were seen in age group 60-69 years ( $n=13$ ). In the group of patients with duration of dialysis more than 2 years, maximum patients were seen in age group 30-39 years ( $n=8$ ). Table 2 shows the periodontal status of patients. In the group of patients with duration of dialysis up to 2 years, CPIN code 3 was more commonly seen ( $n=19$ ). In the group of patients with duration of dialysis more than 2 years, CPIN code 3 was more commonly seen ( $n=10$ ). The CPIN code with least frequency was 4 and X. On comparing the results of both the groups, we observed non-significant results ( $P>0.05$ ) (Fig 2).



**Fig 2:** Periodontal status of patients with duration of dialysis up to 2 years and more than 2 years

**Table 1:** Distribution of dialysis patients based on age-groups

Age-groups (years)	Duration of dialysis		Total
	Up to 2 years	>2 years	
10-19	2	0	02
20-29	9	4	13
30-39	10	8	17
40-49	12	5	16
50-59	12	6	20
60-69	13	5	18
70 and above	3	2	05
Total	61	30	91

**Table 2:** Periodontal status of patients with duration of dialysis up to 2 years and more than 2 years

CPIN code	Duration of dialysis (years)		P-value
	Up to 2 years	>2 years	
0	8	5	0.221
1	14	7	
3	19	10	
4	12	4	
X	8	4	
Total	61	30	

## Discussion

It is well documented that systemic conditions may affect the oral cavity; in contrast to the oral conditions affecting the systemic health remains speculative. Since oral health is intimately related to systemic health, as mouth is truly connected to the rest of the body, the directionality of special relationships has to be clarified. The possibility that mortality and morbidity from systemic disease may be reduced at improving periodontal health makes it imperative that this relationship be examined more closely. The present study was conducted to assess the periodontal health of patients undergoing renal dialysis.

We observed that patients with duration of dialysis more than 2 years had more compromised periodontal health of the teeth as compared to patients with duration of dialysis less than 2 years. This results implies that there is a significant need of dentists to treat patients with complex medical problems and educate them to maintain their oral health efficiently. Chamani G *et al* determined the periodontal status and the level of dental caries in renal dialysis patients in Kerman, Iran. A cross-sectional study was conducted on two groups of patients: one including 68 renal dialysis patients (test) and the other including 30 healthy subjects (control). Half-mouth measurements of Gingival Index (GI), Plaque Index (PI), probing pocket depth (PPD), gingival recession (GR), clinical attachment level (CAL) and bleeding on probing (BOP) as well as decayed, missing or filled teeth (DMFT) index were recorded. The GI, BOP, PPD, CAL and GR were significantly greater among the test group as compared with the control group; however, the DMFT did not differ significantly among the groups. There was no relationship between the duration of the dialysis and the periodontal indices. The authors concluded that patients with chronic renal failure have less favourable periodontal health than normal patients. The present study showed that oral home care practices were inadequate. Thus, preventive programmes to promote the oral health status of haemodialysis patients are needed.<sup>10</sup> Nakhjavani YB *et al* evaluated the oral and dental status of chronic renal failure (CRF) patients undergoing hemodialysis at children's Hospitals in Tehran. Fifty-three children with CRF aged 5-18 years recruited from the renal unit of children's medical center, Tehran Hospitals for children, were studied. The decayed, missing, filled dmf, DMF, and MGI scores were recorded. The CRF children had low prevalence of dental caries, although none of the clinical diagnoses displayed the absence of gingival inflammation. Duration of dialysis and Anemia had a significant influence on the gingival condition. Especially anemia leads to severe gingivitis. It was concluded that the CRF children need careful monitoring and all such patient should be given oral hygiene education as topmost priority. Tadakamadla J *et al* compared caries, oral hygiene and periodontal status of chronic kidney disease (CKD) patients in different stages and

healthy controls. Seventy-four patients diagnosed with CKD and 150 healthy age and sex matched controls were recruited from General Hospital of Udaipur, India. Each subject was examined for caries by decayed, missing and filled teeth (DMFT) index, oral hygiene by simplified oral hygiene index (OHI-S) while gingival and periodontal status were assessed by Loe and Silness gingival and Community Periodontal Index, respectively. All the examinations were conducted by a single investigator. Study subjects presented significantly lower caries experience than the control group but no significant difference was observed among the subjects in various stages of CKD. The mean gingival index score for study group (1.88) was more than twice to that of control subjects (0.92). Stage of kidney disease influenced the gingival and oral hygiene status which decreased as the stage progressed. The overall prevalence of periodontal pockets (70.3%) in diseased subjects was significantly higher than controls (18.9%). More than three quarters (78.9%) of the patients with stage 5 CKD exhibited deep periodontal pockets. It was concluded that oral hygiene, gingival, and periodontal status decreased as the stage of CKD increased and was worse among study subjects than the controls. Dental caries did not differ significantly with the stage of the renal disease but was significantly lower among study subjects than the controls [11, 12].

Naugle K *et al* determined the oral health status of individuals undergoing renal dialysis in southeastern Virginia. A sample was identified for this cross-sectional study via a local health maintenance organization. Three subgroups of the population were studied: 1) those that have been on renal dialysis for less than a year; 2) those on renal dialysis for 1 to 3 years; and 3) those on renal dialysis for longer than 3 years. Three dental indices—the Periodontal Disease Index; the Decayed, Missing, Filled Index; and the Simplified Oral Hygiene Index—were used to identify periodontal disease, dental caries activity, and oral hygiene status. Data were compiled and analyzed by using the parametric test, 1-way analysis of variance. Results suggested that 100% ( $n = 45$ ) of the individuals undergoing renal dialysis presented with some form of periodontal disease. The majority (64%) of the sample displayed either severe gingivitis (28%) or early periodontitis (36%). Sixty-four percent of the sample displayed a high DMF Index, while 98% of the sample accumulated calculus. Oral debris was present in 100% of the sample, resulting in a high Simplified Oral Hygiene Index score, suggesting an increased need for oral care instruction. Findings led to the conclusion that the renal dialysis population in southeastern Virginia, regardless of length of time on dialysis, is in need of comprehensive professional oral care and self-care instruction. Oral disease was present and is a source of active infection in these medically compromised individuals and, as such, has dire implications for morbidity and mortality [13].

## Conclusion

From the results of current study, we conclude that there is dire need for dental practitioners to treat patients with complex medical conditions to protect the natural dentition of these patients.

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