ORAL MANIFESTATIONS OF CHRONIC KIDNEY DISEASE

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ABSTRACT

Current study was performed to evaluate the oral health status in patients with chronic kidney disease (CKD) on dialysis. This was a descriptive study. Hundred chronic kidney disease patients on dialysis were recruited in the study. Findings of the noninvasive oral examination and completed clinico demographic profile were recorded.

Out of hundred patients, 53 were males and 47 were females. Mean age of patients was 51.16 ± 15.09 years with age range of 22 to 83 years. On oral examination, oral hygiene was found to be poor in 47 patients, moderate in 52 and good only in one patient. Xerostomia was present in 87% patients followed by thickened mucosa (12%), angular cheilitis (29%), periodontitis (41%), gingivitis (17%), tooth erosion (40%), tooth mobility (38%), ammonia like odour (Uraemic fetor) (45%), coated tongue (17%), mucosal pallor (37%), metallic taste (48%) and mucosal pigmentation (20%).

Regular oral / dental checkup / referral is needed for the better oral health in these patients and that will improve the compliance to oral drug therapy which in turn will promote the quality of life of CKD patients on dialysis with minimal complications.

INTRODUCTION

Chronic kidney disease (CKD) is defined as a gradual decline in renal function in association with a reduced glomerular filtration rate.1 CKD is characterized by nephron destruction which is the main functional unit of kidney. Once destroyed, nephrons cannot be regenerated and in order to compensate there is hypertrophy of the remaining nephrons thereby maintaining renal function.2 The risk factors for CKD are; hypertension, diabetes mellitus, cardiovascular disease, family history and age older than 60 years.3 The exact incidence and prevalence in Asia is not known, but it has been reported that it might be more than in Western societies.4 It is seen that aetiology and incidence of CKD are generally age dependent and vary according to geography, socioeconomic status, ethnic background.5 Untreated CKD may progress to end stage renal disease and necessitate dialysis or transplantation.6

The oral cavity is a mirror of the body that has a role of a diagnostic indicator for systemic diseases. Like other systemic diseases, renal diseases also have characteristic oral manifestations.7 Poor oral health in patients with CKD is an important problem but is often ignored. Signs of poor oral health and dentition should be an alarm also at early stages of CKD.8 Oral manifestations that have been reported in CKD patients include an ammonia-like odour resulting from a high urea content, gingivitis, xerostomia, mucosal pallor, tooth mobility, malocclusion and a greater risk of dental erosion due to frequent regurgitation.9 Both local and systemic factors influence the oral mucosa resulting in mucosal lesions. Chemical compounds from food intake, tobacco and oral hygiene habits constantly present in the oral cavity. The mucosal barrier is reliant on the efficiency of defensive salivary mucins. Inflammatory reactions are produced by the disturbances in the mucosal barrier or the innate immune system.8 Tongue lesions observed in CKD patients are geographic tongue, migratory erythema and fibrous hairy tongue.10 Most CKD patients on dialysis suffer from gingivitis and periodontitis. Dental erosion is seen as a result of frequent regurgitation, tooth mobility and drifting of teeth is commonly seen, Orange red colour of the mucosa due to carotene like material deposition and metastatic calcification in the perioral area is also reported.11

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Data related to oral health in patients with CKD in Pakistan is scant. This study is therefore designed to evaluate the oral changes in patients with chronic kidney disease in Pakistan.

METHODOLOGY

This was a descriptive study conducted in the department of Morbid Anatomy and Histopathology/Oral Pathology at the University of Health Sciences, Lahore from June and August 2014 after approval of Ethics Review Committee of the institution. Hundred subjects on haemodialysis were collected from Fatima Memorial Hospital, Sheikh Zayed Hospital and Omer Hospital, Lahore. Adult patients of both gender on haemodialysis for more than three months were included in the study. Blood urea nitrogen and albumin were carried out along with haemoglobin levels in all patients. Dentate patients with controlled hypertension and diabetes and having no history of any other chronic medical ailment and on no treatment of any concomitant malignancy were included in the study after their written informed consent. Socio-demographic information (name, age, gender, full address, medical history etc) was obtained along with relevant clinical details. All the information was collected and revealed on a specially designed proformas.

RESULTS

One hundred patients formed the study group the mean age of the patients was 51.16 ± 15.09 years with age range of 22 to 83 years. The mean creatinine levels in hundred patients were 9.8070 ± 2.65958 mg/dl. Mean BUN and albumin were 47.6710 ± 13.35843 mg/dl and 3.6740 ± 0.54469 mg/dl respectively. Mean haemoglobin was 9.36 ± 1.7803 g/dl. By applying independent sample t-test association of haemoglobin with gender was found to be significant in males. Association of creatinine with patients age was found to be significant by applying post hoc tukey test.

On oral examination, oral hygiene was found to be poor in 47 patients, moderate in 52 and good only in 1 patient. Details of oral signs and symptoms can be seen in Fig 1. Xerostomia and periodontitis were the most frequent signs and symptoms observed in CKD patients on dialysis.

Xerostomia was present in 43% males and 44% females. Thickened Mucosa was observed in 5% males and 7% females. Angular Cheilitis was seen in 13% males and 16% females. Periodontitis was observed in 18% males and 23% females. Gingivitis was present 14% males and 3% females. Tooth erosion was seen in 18% males and 22% females. Tooth mobility was present in 14% males and 24% females. Ammonia like odour (Uraemic fetor) was present in 24% were males

Fig 1: Frequency of oral signs & symptoms in 100 dialysis patients

Fig 2: Coated Tongue

Fig 3: Pigmentation of buccal mucosa
and 21% females. Coated tongue (Fig 2) was seen in 9% males and 8% females. Mucosal pallor was seen in 21% males and 16% females. Metallic taste was present in 25% males and 23% females. Mucosal pigmentation (Fig 3) was seen in 11% males and 9% female.

When demographic profile of n = 100 patients was compared with clinical profile, patient’s age was found to be significantly associated with oral hygiene (p = .0130), xerostomia (p = .024), gingivitis (p = .011), tooth erosion (p = .001), tooth mobility (p = .001), uraemic fetor (p = .031) and mucosal pigmentation (p = .000). Patient’s gender was found to be significantly associated with xerostomia (p = .015) and tooth mobility (p = .014). Duration of dialysis was found to be significantly associated with thickened mucosa (p = .009) and uraemic fetor (p = .000) while socioeconomic status showed significant association only with oral hygiene (p = .028).

Similarly when laboratory profile of n = 100 patients was compared with clinical profile, mean creatinine level was significantly associated with only gingivitis (p = 0.013). Mean blood urea nitrogen level was significantly associated with tooth erosion (p = 0.049) and mucosal pallor (p = 0.043). Mean albumin level was significantly associated with only tongue coating (p = 0.017) while mean haemoglobin level was significantly associated with only angular cheilitis (p = 0.025)

**DISCUSSION**

Chronic kidney disease is defined as a gradual decline in renal function. The most common causes are diabetes mellitus, hypertension, chronic glomerulonephritis and autoimmune diseases. Life saving treatment for CKD is dialysis. About 90% of patients on dialysis show oral signs and symptoms that may be the result of increased levels of creatinine and blood urea nitrogen. The most common oral signs seen are mucosal pallor, breath with urea odour, xerostomia and poor oral hygiene.12

On clinical examination, oral hygiene was found to be poor in 47% patients, moderate in 52% and good in only 1% patients. This is consistent with the findings of Bhatsange et al who reported poor oral hygiene in 63% patients on haemodialysis, while it was moderate in 37% and good in none of the patients.14 In contrast, Parkar and colleagues reported in 2012 that 17.11% patients showed poor, 73.6% showed moderate and 9.21% showed good oral hygiene in their study.17

Regarding clinical variables, xerostomia was found to be most prevalent oral lesions (87%) in CKD patients on haemodialysis. A study from India by Patil et al reported the prevalence of dry mouth in 91% which is in concordance with this study.15 Belazelkovska et al from Romania reported a slight decreased prevalence of xerostomia in 66.6% study cases.18 While Melakmakan and his colleagues from Iran found xerostomia in 48.6% patients in their study which was half in frequency than in present study.13 Similar contrast with much lower frequency of dry mouth was reported in 31% of patients in the study carried out by Uday Kumar et al from India19 and Murali et al who reported xerostomia in only 23% patients.16 In current study gingivitis was seen in 17% of patients. A study conducted in India reported the prevalence of gingivitis in CKD patients on haemodialysis as 24%.14

Complain of dysgeusia in current study was found in 48% patients. Quite similarly, Malekmakan and his colleagues from Iran in 2011 reported altered taste in 49% of patients in their study.13 Concurrently, a study from India reported the prevalence of altered taste sensation in 42% CKD patients.15 Belazelkovska et al in 2013 however reported dysguesia in 33% patients while quite lower frequency of 3% was reported from India.16 Coated tongue was seen in 17% patients in current study. Murali et al in 2012 and Uday Kumar et al reported coated tongue as 11% which was in concordance with our findings.16,18 While Belazelkovska et al in 2013 reported that 100% of CKD patients in his study had coated tongue.18

Mucosal pallor in current study was observed in 37% patients. Much higher frequency (83%) was reported in a study by Belazelkovska and colleagues in 2013 while Patil et al reported mucosal pallor in 87% patients which is more than twice than the findings in current study.18,15 In current study breath with ammonia like odour, also known as uraemic fetor was observed in 45% patients. Belazelkovska and his colleagues reported uraemic fetor in 56% patients. Melakmakan et al reported 31% uraemic fetor in CKD patients on haemodialysis.18,19 Murali et al reported uraemic fetor in 17% patients while Uday Kumar et al in 2006 reported this oral feature in only 8% of CKD patients.16,19

In current study mucosal pigmentation was seen in 20% patients. Murali et al in 2012 reported mucosal pigmentation in 12% patients which is almost half in frequency than the findings in the current study.16 Angular cheilitis is another finding in current study which was seen in 29% patients. Belazelkovska et al in 2013 reported angular cheilitis in nearly twice the number (63%) while Uday Kumar et al in 2006 reported this feature seen in 12% patients which was nearly half a frequency than in the patients of current study.18,19 Quite disconcordantly, Murali and colleagues reported angular cheilitis in only 2% patients.16

**CONCLUSIONS**

The overall dental health in chronic kidney disease patients on dialysis was found to be neglected. Regular oral/dental checkup/referral is needed for the better
oral health in these patients and this will improve the compliance to oral drug therapy which in turn will promote the quality of life of CKD patients on dialysis with minimal complications.

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REFERENCES


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