

RENAL DISEASE AND ITS ORAL MANIFESTATIONS
: REVIEW AND CASE REPORT

ABSTRACT:

Chronic renal disease is a condition defined as the progressive and irreversible loss of renal function, leading to marked reduction in the glomerular filtration rate. This condition manifests oral consequences very frequently. About 90 % of the patients with renal failure have oral symptoms like dry mouth, mucosal pallor, stomatitis, uremic odor, change in taste, glow salivary flow. Moreover, candidiasis and recurrent herpes are more common in chronic renal disease.

The aim of the article is to familiarize the dental clinician with the oral signs of patients with renal disorders through these case reports. Dental treatment plan should be made taking into consideration, that these patients have a greater tendency of bleeding, hypertension, anemia, drug intolerance and increased susceptibility to infections.

KEYWORDS: Renal disease, chronic renal failure, uremia, uremic stomatitis

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INTRODUCTION :

All the diseases affecting the human body tend to show their manifestations mostly in the oral cavity. Making a thorough assessment of oral status of a patient is a must in diagnosing sometimes an underlying systemic cause. Kidneys are the vital organs for maintaining a stable internal environment i.e. haemostasis. The renal system comprises an essential part of the normal physiology of human body and causes maximum cases of mortality and morbidity worldwide. There are two main diseases related to kidneys namely Chronic renal disease and End stage renal disease (ESRD), which are approximately 25-40 %. Chronic renal disease is the twelfth leading reason of death.¹ The various functions of kidneys include excretion of metabolic waste, blood pressure control, Vitamin D activation and electrolyte regulation.²

Acute and Chronic renal failure result from an inability of the kidneys to adequately filter metabolic wastes from the blood. This results in reduced GFR and an accumulation of ammonia and uric acid causing systemic imbalance.²

Chronic Renal Disease is defined as the structural and functional abnormality of kidneys including with/without GFR leading to kidney damage. It includes abnormalities in urine and blood composition. GFR less than 60 mL/min. per 1.73 m² for 3 months or more, with or without kidney damage is indicative of chronic renal disease. It leads to clinical syndrome called uremia. Signs of uremia are hematological changes, bone metabolism changes and alteration in immune status. This condition is measured by creatinine clearance which gives an acceptable approximation of the value of GFR.³

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The function of kidneys can be assessed indirectly to the plasma creatinine levels. Normal value of serum creatinine is 0.5-1.4 mg/dL. Diabetes mellitus, arterial hypertension and glomerulonephritis are the most important etiological factors for chronic renal disease.³ Treatment of chronic renal insufficiency include dietary changes, correction of systemic complications and dialysis or renal graft. About 90% of renal failure patients have oral symptoms, which may be consequences of dialysis and renal transplantation and etiological factors causing chronic renal failure.⁴

This article highlights the scenario of improper regulation of the excretory system and its effects on the other aspects of health with a focus on ill effects on oral health. It also reviews the various precautionary measures to be taken in a dental set up.

ETIOLOGY AND PATHOGENESIS:

Patients may report with a variety of oral complaints prior to or with the appearance of oral symptoms. On several occasions, frank uremia, metabolic acidosis and hypertensive crisis is present. These symptoms indicate chronic renal failure followed by hemodialysis which further complicates the situation causing various oral manifestations.^{2,4}

Once diabetic nephropathy is established in a patient, continuous ambulatory peritoneal dialysis follows which can further cause repetitive bacterial peritonitis. This is also accompanied by complaints of hypoacusis and neurosensorial cochlear deafness in some patients.¹

After years of evolution, the patient can present with glaucoma in the eyes. The patient can also show complications due to diabetes mellitus and peripheral vascular problems and signs of secondary hyperparathyroidism.¹

CLINICAL PRESENTATION:

Patients with acute or chronic renal failure present with the clinical symptoms when it starts affecting the gastrointestinal system, it causes nausea, vomiting, ammoniacal taste and halitosis. Neuromuscular symptoms vary from headache, peripheral neuropathy to seizures in some cases. Blood picture shows lymphocytopenia, increased bleeding tendencies in several patients.

Endocrinal symptoms are similar to that of secondary hyperthyroidism also impairing growth. Renal failure can affect the cardiovascular system causing congestive heart failure, pericarditis. Bone changes are presented as bone resorption, osteitis fibrosa, delayed growth, rickets and delayed tooth eruption.¹

ORAL MANIFESTATIONS

The patient can present with enlarged salivary glands accompanied by a decrease in salivary flow causing an increased tendency to dental caries. Dry mouth or xerostomia is a common manifestation accompanied by a very frequent complaint of halitosis caused by a breakdown of urea into ammonia. This is the most predictable outcome because of an increase in urea levels in patients with chronic renal failure. The patient also complains of a metallic taste in mouth. Dry mouth also results in difficulty in speech, mastication and swallowing.^{5,8}

If the renal failure occurs in growing stages of life, altered or delayed eruption occurs along with enamel hypoplasia with or without brown discoloration. Calcification of pulpal chamber in adult patients can also occur. There is increased calculus formation requiring meticulous oral prophylaxis from the dentist and the patient to prevent further bacterial complications.²

The mucosa is pale with low grade gingival inflammation. It can be induced by cyclosporins or calcium channel blockers. It principally affects labial and interdental papilla. It can become extensive involving the gingival margins, lingual and palatal surfaces.⁶

The patient also has a frequent occurrence of petechiae, ecchymosis and gingival bleeding caused due to increased bleeding tendencies because of impaired platelet functions.⁷

Due to continuous administration of immunosuppressive drugs, lichenoid reaction (drug induced) and pyogenic granuloma are frequently observed in CRF patients. Moreover, due to drug related immunosuppression, oral hairy leukoplakia can be observed. These lesions lack Epstein Barr Virus (EBV) but appear similar clinically and histopathologically.⁷

Oral candidiasis may affect 20-30 % transplant patients. Candidal infections may present as angular cheilitis, pseudomembranous and erythematous ulcerations or chronic atrophic infections. Viral infections such as Herpes Simplex Virus (HSV) used to be common in transplant recipients. The use of anti-herpetic agents such as 5% Acyclovir has significantly reduced the frequency of these infections.⁵

The risk of oral squamous cell carcinoma in the patients receiving hemodialysis is generally similar to that of otherwise healthy individuals in the general population. Although there have been reports suggesting that therapy following renal transplantation predisposes to epithelial dysplasia and carcinoma of lip. Any increased risk of oral malignancy in renal failure probably reflects the effects of iatrogenic immunosuppression which increases liability to

virally associated tumors such as Kaposi sarcoma or non Hodgkin lymphoma.⁹

Finally, uremic stomatitis is an oral complication of unknown aetiology and it is relatively uncommon, usually seen in patients with an end stage or untreated renal disease. The onset may be abrupt with white plaque, distributed predominantly on buccal mucosa, tongue and floor of mouth. The clinical appearance has been known to mimic oral hairy leukoplakia.¹

RADIOGRAPHIC FEATURES

Demineralisation of bone may be seen along with loss of bony trabeculations.

These may present either as generalized demineralization or as frank intrabony lesions (in more advanced stages), sometimes containing focal tumors that are histologically similar to giant cell tumors of the bone giving a ground glass appearance in some areas.¹⁰

Socket sclerosis is seen in most areas which causes tooth mobility in most of the cases. Bone osteodystrophy follows

with decrease or loss of cortical bone observed at the mandibular angle and around the maxillary sinuses, mental foramen and mandibular canal.¹⁰

CASE REPORT 1:

A 45 yr old male reported to the Department of Oral Medicine and Radiology for bleeding in the oral cavity. He had a medical history of chronic renal failure since 3 years and was on periodic hemodialysis, which he underwent irregularly. The patient presented with extreme pallor, cold clammy skin, excessive weight loss and tremors. Regarding the dental history, the patient presented with a strong malodor and ulcers in the oral cavity covered with a white pseudomembrane suggestive of uremic stomatitis and there were white scrapable patches indicating candidal infection. (Fig 1,2 and 3). The patient had an increased serum creatinine levels of 12.6 mg/dL and blood urea of 381 mg/dL

CASE REPORT 2:

Another patient, a male aged 62 years of age reported to the department of Oral Medicine and Radiology with the



Fig. 1,2 : Ulceration seen on the right lateral border of the tongue and the right buccal mucosa covered by a white pseudomembrane.



Fig. 3 : White scrapable patches suggestive of candidiasis seen on the right buccal mucosa along with deep periodontal pockets and gross calculus deposition.

Fig 4 : Ulceration on lateral aspect of tongue covered by necrotic slough on the tongue.

complaint of multiple mobile teeth. He was a known case of chronic renal failure since 1 year, undergoing haemodialysis. The oral examination showed irregular ulceration on the tongue with lack of an erythematous halo and was covered with necrotic slough. (Fig 4) The patient had abnormal serum chemistry with high level of serum potassium.

DENTAL CONSIDERATIONS IN PATIENT WITH RENAL DISEASE

As a dentist, precautionary measures need to be considered before, during and after treatment. It is although always preferable to avoid any dental treatment if the disease is unstable because untreated dental infections in immunosuppressed individuals can potentially contribute to mortality and transplant rejections. Regular non-surgical oral prophylaxis is indicated in these patients for accurate oral hygiene. Infection is poorly controlled in immunosuppressed patients, which may spread locally or systemically as bacteremia. Antimicrobial considerations include Erythromycin and Cloxacillin in standard doses. Penicillin, metronidazole, cephalosporin should be given in low doses, as they are inadequately metabolized. Since very high serum level can be toxic to central nervous system, Aspirin and other NSAIDs should be avoided as they increase gastrointestinal irritation and bleeding associated with renal failure.¹¹

To minimize the risk of adrenal crisis in individuals who have taken large doses of corticosteroids (10mg prednisolone daily) and undergoing major surgical procedures (such as extractions of more than one tooth), appropriate corticosteroid cover should be administered before treatment.

In patients with increased bleeding tendencies, the treatment should be carried out only when the effect of heparin is minimum, which is one day after dialysis. Careful haemostasis should be ensured in various surgical procedures. If bleeding is prolonged, desmopressin can provide haemostasis for upto 4 hours. If this fails, cryoprecipitate may be effective.³

Routine annual dental radiographs should be done to establish and follow manifestations of osteodystrophy. Therapy for xerostomia should be continued and routine recall maintenance must be ensured.

CONCLUSION :

The prevalence of chronic renal failure is increasing day by day. Oral and systemic complications can occur as a result of chronic renal failure and its treatment. Upto 90 % of patients with chronic renal disease show oral signs and symptoms, such as bleeding tendencies, greater susceptibility to infections and gingival overgrowth produced by

cyclosporine. As for dental considerations and management strategies for these patients, we should take into account that the drug dose adjustment must be done using creatinine clearance; before invasive dental procedures, a blood test must be requested. The well supervised treatment protocols, in the dental management of individuals with chronic renal failure can be effective and safe.

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