Medical and Research Publications
International Open Access

Review Article **Journal of MAR Dental Sciences (Volume 6 Issue 5)**

Oral Manifestations and Management of Patients with Hyperphosphatemia: A Review

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Received Date: December 19, 2022

Published Date: January 01, 2023

Abstract

Introduction: *The prevalence of oral symptoms in CKD patients appears to be linked to immunosuppression, poor oral hygiene, malnutrition, restrictive diets, and the effects of medications and uremic toxins on oral tissues. Recent epidemiological investigations have shown that there are strong links between disorders of the oral tissues and diseases of non-oral tissues. Sometimes the roles might be inverted, and systemic sickness coming from another region of the body can have a serious impact on the oral cavity.*

Purpose of the study: *The purpose of this study was to know about the oral manifestations associated with hyperphosphatemia and how to manage those complications.*

Methodology: *This study has been conducted by a literature review of scholarly research articles, peer-reviewed articles, journals, and case studies. The study use methodology: this study had been conducted by a literature review of scholarly articles, peer-reviewed articles, journals, and case studies. The study used fifteen articles for the relevant information, which was then reviewed and reduced to ten articles.*

Results: *The findings revealed that 28.7% of respondents (96.60% CKD patients) reported a loss of taste. The length of treatment and taste loss, patients' age and taste impairment, and patients' age and the perception of a metallic taste all showed statistically significant correlations.*

Discussion: *When compared to the general population, patients who have CKD are at a higher risk of developing oral health issues like periodontal disease, tapering of the pulp chamber, enamel abnormalities, xerostomia, and premature tooth loss. Oral health in dialysis and transplant patients has been projected to be poor, with a possible influence on patient's quality of life, because CKD patients display medical, psychological, and socioeconomical features that may predispose to odonatological disorders.*

Conclusion: *Dentists may have a significant impact on the early detection of CKD since oral symptoms and indications are frequently the sole observable indicators of systemic illnesses. Additionally, as most salivary biomolecules are obtained from serum, laboratory examinations of saliva's constituents may be particularly significant in the early, asymptomatic stages of CKD.*

Keywords: *"Hyperphosphatemia" AND "Chronic kidney failure" AND "Gingival lesions" AND "Oral manifestations in kidney failure" AND "End-stage in kidney failure"*

Introduction

A common endocrinopathy that develops because of chronic azotemic kidney illness is renal secondary hyperparathyroidism. The most severe clinical repercussion of renal secondary hyperparathyroidism, renal osteodystrophy, is rare but can cause pathological jaw fractures, demineralization of the maxillofacial bones, and loosening of the teeth.

A change in nutritional assessment results in systemic manifestations that have an impact on oral health, such as dysbiosis of the oral microbiota, hypovitaminosis C-related slow wound healing, and changes in the supporting bone structures of the oral cavity brought on by metabolic acidosis and vitamin D deficiency. Localized low-grade inflammation has been seen to be a hallmark of periodontal disorders, and CKD has been linked to a bidirectional systemic amplification of the pathogenic process.

As a result, patients with CKD and oral diseases should be managed by a multidisciplinary professional team that can assess the potential co-existence of these two pathological illnesses, which have a detrimental impact on one another, and develop therapeutic plans to address them. In the absence of medical intervention, chronic renal failure (CRF) is a gradual, irreversible, and progressive disease that develops over years and results in death. Numerous illnesses, including diabetes mellitus (DM), hypertension, glomerulonephritis, interstitial nephritis, pyelonephritis, and polycystic kidney disease, affect the nephron mass of the kidneys and are responsible for CRF. DM is the one of these that causes CRF the most frequently.

The impact of chronic kidney disease (CKD) on patients' morbidity and death is quite substantial, despite advancements in patient care and renal replacement treatment. The sixteenth largest cause of years lost to premature death worldwide is chronic kidney disease (CKD). Preventing negative CKD-related outcomes, such as cardiovascular disease, end-stage kidney disease, and death, requires appropriate screening, diagnosis, and management by primary care providers.

Methodology

The primary working hypothesis derived out this research was to know about oral complications associated with hyperphosphatemia and how to manage these diseases in possible ways.

The methodology used to derive this hypothesis was a literature review of scholarly articles, peer-reviewed articles, journals, and case studies. The research study began with the identification of the oral manifestations associated with chronic kidney failure and its management. This systemic review

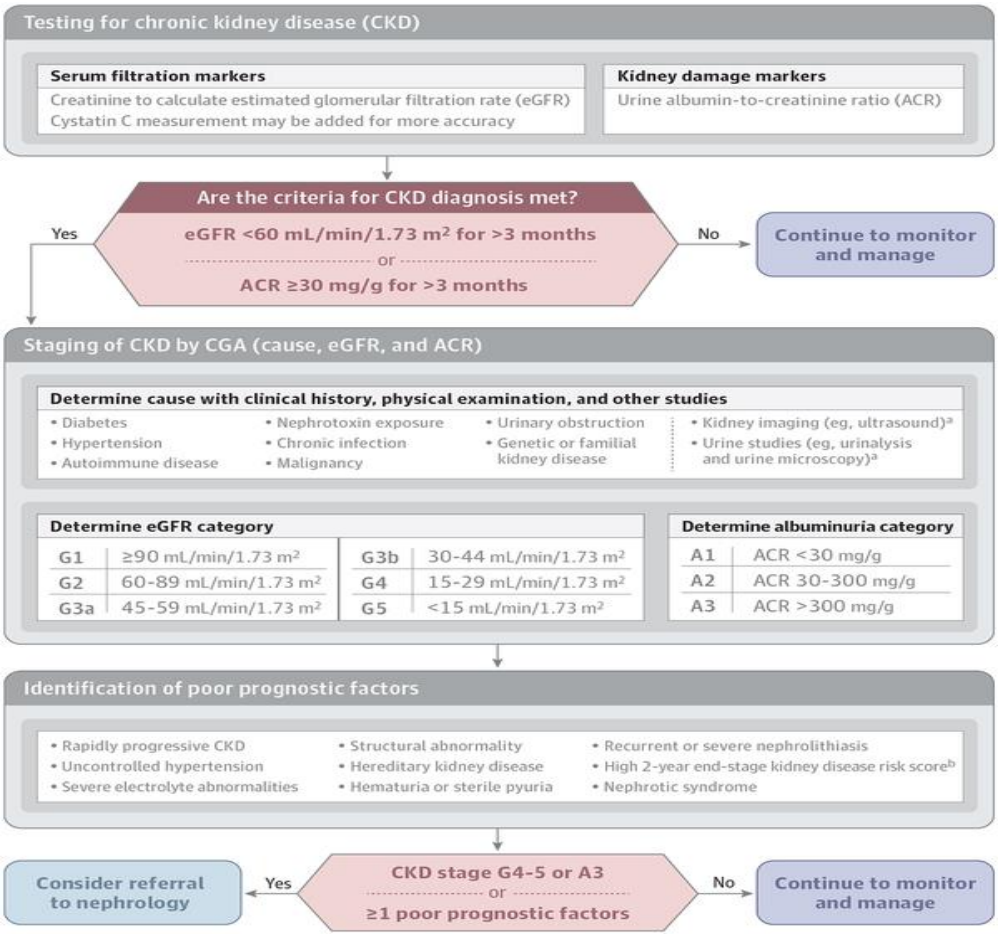
was conducted in a phased manner and included the establishment of an overall strategy, determination of the inclusion and exclusion criteria, and literature and case study classification and analysis.

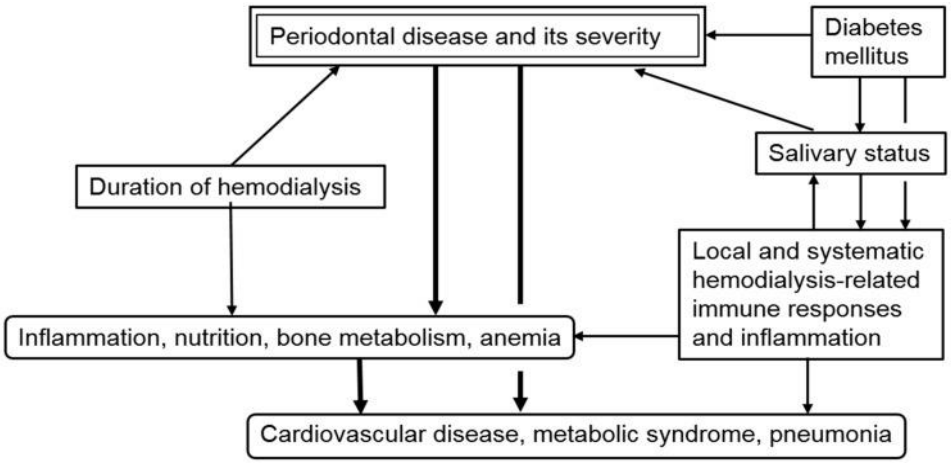
Results

Patients with CKD often experience oral manifestations like taste distortion. Estimates from the Perio Cardio study (22.0%, 12.3%) and the NSAOH (5.4%, 1.3% respectively) indicated that the extent of periodontal attachment loss and periodontal pocketing among Aboriginal Australians with renal illness was several orders of magnitude greater (51.0%, 21.4%, respectively).

In contrast to 15 out of 90 (16.7%) controls, oral lesions were present in 86 out of 90 (96.5%) CKD patients (p 0.001). In 81 of 90 (90%) CKD patients, abnormal lip hyperpigmentation was the most frequently observed lesion. Other noteworthy observations included aberrant taste, xerostomia, candidiasis, burning mouth, and bleeding gums.

Mucocutaneous involvement is highly common in CKD patients receiving hemodialysis, and some of the instances are medically and aesthetically upsetting. As a result, the effects can be better predicted and controlled with greater knowledge of the kind and prevalence of these involvements.





Discussion

When compared to the general population, patients who have CKD are at a higher risk of developing oral health issues like periodontal disease, tapering of the pulp chamber, enamel abnormalities, xerostomia, and premature tooth loss. Oral health in dialysis and transplant patients has been projected to be poor, with a possible influence on patient's quality of life, because CKD patients display medical, psychological, and socioeconomical features that may predispose to odonatological disorders.

Uremic halitosis is a well-known clinical trait of CKD patients, and there is no information on how to diagnose this consequence in patients receiving renal replacement treatment. Subjective and objective data were separated out of the oral symptoms. Dry mouth, a change in the flavor of the tongue, and/or a burning sensation on the mucosa were included as subjective results. Each patient was questioned regarding the symptoms to evaluate the subjective findings. Uremia odor, tongue coating, mucosal petechiae or ecchymosis, and ulceration were all considered objective findings. When the patient was speaking, the odor was detected to record the uremic odor. Under a torchlight's illumination, tongue coating, mucosal petechiae or ecchymosis, and ulcers were noted. Diffuse opacities on the surface of the teeth were identified as enamel hypoplasia when the criteria established by Alaluusua et al. were used.

By using an index that was recorded by the number of decaying, missing, and filled teeth (DMFT), the number of DMFT was determined. DMFT is a numerical representation that shows each person's individual prevalence of tooth decay. The international society recognizes this evaluation technique as a sign of oral health. The World Health Organization advises adding the number of decaying (D), missing tooth/unerupted (M), and filled (F) teeth (T) to arrive at the total (WHO). Oral health can be defined as the total normality of teeth and always supporting structures in terms of both morphology

and function, as well as the perioral components and structures connected to mastication and the maxillofacial complex.

Oral health also has an impact on general health, especially in vulnerable people like CKD patients. In our study, patients with and without diabetes experienced dry mouth, with no discernible statistical difference. According to earlier literature studies, dry mouth in the diabetes group was more severe than in the nondiabetic group, which conflicted with this finding. The frequent occurrence of dry mouth has a few causes.

People without diabetes were shown to have a considerably higher rate of dysgeusia than patients with diabetes. According to reports, urea in the saliva and its subsequent breakdown by bacterial ureases into ammonia and carbon dioxide are what give uremic patients a metallic taste. Changes in taste can be caused by metabolic disturbances, the use of drugs, a decrease in the number of taste buds, and modifications to the composition and movement of saliva. Patients with chronic uratemia may experience a wide variety of lesions, such as gingival hyperplasia, enamel hypoplasia, petechiae, gingival hemorrhage, and other abnormalities.

These individuals need a variety of treatments, such as dialysis and kidney transplants in addition to dietary and lifestyle modifications. Clinical indicators of an advanced uratemic condition that affects both the hard and soft tissues frequently include oral cavity manifestations. Occasionally, these manifestations may also be brought on by treatment procedures including dialysis and/or kidney transplantation, fluid restriction, dietary modifications, and adverse effects of systemic medicine.

These patients' oral microbiota has undergone the following changes: There are differences in species distributions and antifungal susceptibility profiles, and the rate of yeast colonization is higher than usual. The oral mucosa of HIV-positive patients has been observed to have focal necrotizing lesions that are unique from periodontal disease patterns and associated to P. aeruginosa. After receiving systemic antibiotic medication, the lesions healed, and later culture examinations showed that the infection had also disappeared.

Conclusion

The most frequent oral conditions in children and adolescents who had kidney transplants were gingival hemorrhage, enamel abnormalities, and DIGO. DIGO was linked to the use of amlodipine and anticonvulsants, while everolimus use was positively correlated with oral ulcers.

The current study concludes that people with chronic renal disease have worsening oral hygiene. In CKD patients, receiving good oral and dental care can enhance the success of transplantation. The persistently high phosphate hyperphosphaturia results from consumption, which has been It has recently been demonstrated that an accumulation of calcium phosphate particles can cause renal infarction and a subsequent reduction in kidney function.

This could then result in a decrease in phosphorus excretion from the kidneys and the concurrent emergence of hyperphosphatemia that accelerates renal deterioration function (by increasing the number of calcium-phosphate ions in the hazards related to tubular lumen of living nephrons) such as heart attacks and increased mortality. Oral lesions are common in the short term after renal transplantation and are particularly related to both toxicities of immunosuppressive drugs and immunosuppression.

In comparison to non-diabetics, Chronic renal failure patients with diabetes mellitus showed a greater incidence of oral uremic symptoms as uremic fetor, bad taste, pale mucosa, and dry, cracked lips. Patients with Chronic renal failure experience worsening oral health when their CRF stays longer.

The diabetic individuals receiving hemodialysis had a significant risk of acquiring periodontal disease as well as a possible danger of tooth loss and dental decay. Literature from the past suggests that diabetes with high uremic status may have a negative impact on periodontal health, and that periodontal infection may have a negative impact on glycemic management, which may increase the risk of various systemic problems. To conclusively prove that treating periodontal infections can help lessen the burden of diabetic complications and so improve these patients' overall health, more thorough research is required.

To correctly identify and correlate the oral symptoms, additional correlating criteria must be assessed, such as the length of dialysis, the duration of CKD, the drugs that patients are taking, and salivary pH and urea levels. For these individuals, supportive dentistry programs must be implemented to determine the influence of microorganisms that could increase the risk of systemic problems. Communication and collaboration between dentists and physicians are necessary for patients with End Stage Renal Disease and hyperparathyroidism.

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