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Training patients with chronic kidney disease for proper oral hygiene

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Abstract

The aim of this study is to review the literature regarding oral hygiene in people with Chronic Kidney Disease (CKD) and provide general information about protecting and preserving oral hygiene.

Scientific research in English and Greek literature was conducted and 29 articles were perused which referred to the CKD and to the manifestations and symptoms created in the oral cavity.

CKD patients present oral manifestations more often (90%) therefore hints and tips are provided to patients concerning the proper brushing of the teeth, the care of the dentures, the dry mouth and the mucosal lesions. Moreover, clear instructions about what the patients should do before their visit to the dentist and about the importance of frequent recalls are included.

The detection of the problem and the correct guidance of the renal nurses and nephrologists that treat the patient is determinant in preventing the augmenting index of mortality of these patients. The dentist should contribute by keeping patients' oral hygiene at a good level, preventing the appearance of inflammation and infection which are important factors for their wellbeing.

Introduction

Chronic kidney disease (CKD) results from the progressive and chronic deterioration of nephrons, which takes place over years and is characterized by hydroelectrolytic, metabolic and immune disorders due to progressive and irreversible loss of renal function [1,2].

CKD presents a major public health challenge with an estimated global prevalence of 11-13%. Around 0.1% of the populations of developed countries live with end-stage renal disease, therefore there is a great-percentage of patient's dependent on renal replacement therapy (hemodialysis–peritoneal dialysis) or with a kidney transplant. In the earlier stages of CKD patients may be asymptomatic and unaware of their diagnosis. Proteinuria and reduced renal function pose significant risks of cardiovascular diseases and other complications [3]. Cardiovascular disease (CVD), which is often due to or combined with atherosclerosis, is the main cause of death in patients with CKD. A number of traditional, novel, and uremic-specific risk factors coexist in CKD and contribute to the increased cardiovascular risk in CKD population [4,5]. Poor oral health, which is related to advanced age and diabetes mellitus, may constitute an under-recognized novel risk factor, because recent studies have shown how periodontitis is associated with coronary heart disease and cerebrovascular disease in the general population as well as in hemodialysis (HD) patients (80%). A plausible explanation would involve bacterial pathogens causing periodontitis, leading to systemic inflammation as induced by lipopolysaccharide coats and thus triggering atherogenesis, thrombus formation, and platelet aggregation [6]. The patients with more severe stages (stage 4 and stage 5) of CKD manifest a more severe periodontal disease [7,8].

However, periodontal diseases are treatable and modifiable risk factors [4,5]. Furthermore, novel links between manifestations of poor oral health and systemic complications in CKD such as Protein-Energy Wasting (PEW), infections, and atherosclerotic complications are being established [9]. The aim of this study is to review the literature regarding oral hygiene in patients with CKD and so to provide general information in protecting and preserving oral hygiene.

Methods

Chronic kidney disease and oral manifestations

To do an update on oral manifestations and oral hygiene for these patients, we searched articles from the literature, PubMed and Scopus database using the following key words: "chronic kidney disease", "renal disease", "dialysis", "kidney transplant" combined with: "oral manifestations", "oral symptoms", "oral hygiene", "dental treatment". The search was limited to articles in English or Greek. Twentynine articles were used (8 of them are reviews, 2 are systematic reviews, 2 case reports, 1 cohort study, 3 case-control studies, 5 cross sectional studies, 1 epidemiologic study, 1 oral care guideline, 1 protocol and 5 newsletters) published during the last 20 years.

CKD is one such disease which involves a spectrum of oral manifestations, often due to the disease itself and treatment.

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Approximately 90% of patients with CKD will have oral signs or symptoms, including dry mouth, metallic taste, halitosis, gingival changes (bleeding and hyperplasia), mucosal lesions, periodontal disease, candidiasis, dental anomalies (narrowing or calcification of the pulp chamber and loss of non-carious tooth tissue) and problems to the bone of the jaws [5,10-17]. The articles above demonstrate that poor oral hygiene can impinge on a patient's wellbeing and may compromise nutritional intake due to related dental pain, mobile teeth due to gum or periodontal disease, and loss of teeth. (average to 68.7%). Conditions arising from poor oral health can also result in profound psychosocial effects for the individual, negatively affecting their quality of life. (average to 76.7%) [16,18]. For example: Halitosis can cause embarrassment and consequently can interfere with social relationships. Taste disorder can affect appetite and hence the enjoyment of food. Missing teeth can negatively impact on self-image and self-esteem, while resulting in problems with speech and eating, (average to 62.1%). Xerostomia, caries, and mucosa lesions can cause discomfort or pain, resulting in distress and affecting appetite/speech [19]. Thus, it is important for the patients and the people who take care of them to understand the importance of oral hygiene and to identify oral manifestations that need to be treated by the dentist [7,20].

It has been demonstrated that, in general, mouth care is given a low priority in clinical practice [3,9]. It may occur because the level of awareness of nurses concerning the interrelations between oral-dental status and clinical findings of diseases affecting oral cavity structures, is very low [21].

Discussion

Guidelines for a good oral health in CKD patients

Below we can notice the proposal actions for everyday oral hygiene which may help patients prevent oral manifestations. As far as tooth-brushing is concerned, renal nurses or caregivers should be ensure that all patients have their own toothbrush. Tooth-brushing is the best method for removing dental plaque, which is a thin coat of sticky colorless bacteria that forms on teeth through eating and drinking, sugary foods, and beverages. These bacteria absorb sugar and convert it into acid, which destroys tooth enamel, thus resulting in caries. The patients should perform regular oral cleansing with a toothbrush (small head with soft bristles) and a pea-sized amount of fluoridated toothpaste containing at least 1350 ppm fluoride. Higher fluoride (2800 or 5000 ppm) toothpaste can be prescribed for patients with dry mouth and/or sensitive teeth to erosion [22]. Moreover tooth-brushing should be done at least twice a day - morning and night. Patients should not drink or eat for 30 minutes after brushing and not at all after brushing at night [16,23]. Patients should be advised to spit, and the mouth should not be rinsed during/after tooth brushing (this ensures that the beneficial effects of the fluoride in the toothpaste are optimized). Patients should not brush their teeth immediately after an acidic meal/vomiting. Instead, they can be encouraged to rinse their mouth with water. The patients have to be well-informed to replace their toothbrush regularly (about every 3 months) before the bristles become excessively frayed, as this is when the toothbrush is less efficient to remove dental plaque[16]. Also, chlorhexidine 0.2%, without alcohol mouthwash (used 30 minutes after tooth brushing) is the agent of choice to reduce dental plaque by inhibiting bacterial growth but frequent use tends to stain teeth. It may be advised for gum disease, too [22,23].

As for the denture's care, dentures should be cleaned thoroughly after each meal, using a small toothbrush/denture brush and a denture cleaning paste or fragrance-free soap to remove debris and plaque. They should also be removed every night, cleaned, and left overnight in water. Denture cleansing tablets have been proven to reduce the total bacterial count, but some can damage metal framed dentures and should not be used [22]. Patients with dry mouth should be reminded to keep their mouths clean and have frequent sips of water. If they are on fluid restriction, they should hydrate the mucosa with a sponge stick/moist soft toothbrush. To relieve a dry mouth, recommend sugar-free chewing is recommended to stimulate salivary flow [22]. Sweets and lemon drinks used by some patients to stimulate saliva should be avoided as they greatly increase the risk of dental decay and dental erosion. In the presence of mouth ulcer, the patient needs to be advised to rinse the mouth after meals besides maintaining standard oral care. The use of topical analgesic and/or anti-inflammatory mouth sprays/mouthwashes with a numbing effect (e.g., benzydamine HCL 0.15%) may be recommended by the dentist. If the ulcer is present for longer than 2 weeks, patient has to visit his dentist once more [20,22].

Nurses should provide oral hygiene care to admitted patients who are unable to carry out the procedure for themselves [24]. Studies have also revealed that most of the CKD patients would like their care providers not only to ask them if they need help with oral care but also if they have completed it successfully [25,26]. Of course, they should not forget to advise regular dental check-up at least every 6 months and to refer their patients to the dentist when they notice unusual characteristics and symptoms [27]. Moreover, special attention should be given if these patients need to take analgesics or antibiotics [5,11,15,17,28].

Conclusion

In conclusion, CKD can give rise to a wide range of oral manifestations which may contribute to systemic consequences. But good oral care can prevent complications and improve patients' quality of life. That is why the provision of effective mouth care to patients with CKD (regardless of the disease stage and type of treatment option) is possible if caregivers and the patients themselves are fully aware that poor oral hygiene can lead to oral disease that may predispose these patients to systemic complications, increasing the risk for mortality. That is why the collaboration between medicine and dental medicine specialists and nurses is crucial. Specifically, for the better promotion of oral hygiene in patients with CKD the interdisciplinary team should follow specific training protocols.

References

1. Nakhjavani YB, Bayramy A (2007) The dental and oral status of children with chronic renal failure. *J Indian Soc Pedod Prev Dent* 25: 7-9.
2. Proctor R, Kumar N, Stein A, Moles D, Porter S (2005) Oral and dental aspects of chronic renal failure. *J Dent Res* 84: 199-208. [Crossref]
3. Randall DW, Yaqoob MM (2018) Oral Health in Chronic Kidney Disease. *Austin Dent Sci* 3: 1018.
4. Fisher MA, Borgnakke WS, Taylor GW (2010) Periodontal disease as a risk marker in coronary heart disease and chronic kidney disease. *Curr Opin Nephrol Hypertens* 19: 519-526. [Crossref]
5. Dimitriou A, Zervou-Valvi F (2011) Chronic kidney disease and oral health. *Hellenic Hospital Dentistry* 4: 35-43.
6. Krane V, Wanner C (2016) Should we aim for oral health to improve outcomes in chronic kidney disease. *Nephrol Dial Transplant* 31: 1551-1554. [Crossref]
7. Ausavarungnirun R, Wisetsin S, Rongkiettechakorn N, Chaichalermsak S, Udompol U, et al. (2016) Association of dental and periodontal disease with chronic kidney disease in patients of a single, tertiary care centre in Thailand. *BMJ open* 6: e011836. [Crossref]

8. Tadakamadla J, Kumar S, Mamatha GP (2014) Comparative evaluation of oral health status of chronic kidney disease (CKD) patients in various stages and healthy controls. *Spec Care Dentist* 34: 122-126. [Crossref]

9. Akar H, Akar GC, Carrero JJ, Stenvinkel P, Lindholm B (2011) Systemic consequences of poor oral health in chronic kidney disease patients. *Clin J Am Soc Nephrol* 6: 218-226. [Crossref]

10. Kuravatti S, David MP, Indira AP (2016) Oral manifestations of chronic kidney disease-an overview. *Int J Contemp Med Res* 3: 1149-1152.

11. Paschalidis Th, Antoniades K (2009) Treatment of dental patients with chronic renal failure: A review. *Stoma* 37: 131–143.

12. https://www.chatzogianni.gr/en/enimeroseis/Χρόνια%20Νεφρική%20Νόσος%20και%20στοματική%20υγεία-16

13. https://www.cdho.org/Advisories/CDHO_Factsheet_CKD.pdf

14. Vesterinen M, Ruokonen H, Leivo T, Honkanen AM, Honkanen E, et al. (2007) Oral health and dental treatment of patients with renal disease. *Quintessence international* 38: 211-219. [Crossref]

15. Kouri H, Grapsa E, Sumpasi L (2000) Renal patient in dentistry. *Stomatologia* 57: 128-133.

16. https://www.edtnaerca.org/resource/edtna/files/Oral_Care_2018.pdf

17. Macha D, Swapna LA, KoppoluP, Bathini C (2014) Guidelines for the Management of Chronic Kidney Disease Patients in Dental Setup. *J Res Adv Dent* 3: 62-68.

18. Batista MJ, Lawrence HP, De Sousa MR (2018) Oral health literacy and oral health outcomes in an adult population in Brazil. *BMC Public Health* 18: 60. [Crossref].

19. Stamadianos B, Alexias G, Anagnostopoulos F (2009) Oral health and quality of life of dental patients in the General Hospital of Kalymnos. *Archives of Hellenic Medicine* 26: 503-516.

20. Oyetola EO, Owotade FJ, Agbelusi GA, Fatusi OA, Sanusi AA (2015) Oral findings in chronic kidney disease: implications for management in developing countries. *BMC oral health* 15: 24. [Crossref]

21. Angelova S (2020) Evaluation of factors for oral health in relation to pyelonephritis in childhood. *JIMAB* 26: 3073-3080.

22. https://www.kidney.org.uk/good-mouth-care-in-established-renal-failure

23. www.worldoralhealthday.org

24. https://www.4ype.gr/uploads/e_paper/beltiosi/nos-prot/Prwtokollo_stomatikis_ygieinis.pdf

25. Coker E, Ploeg J, Kaasalainen S (2020) Relying on nursing staff for oral hygiene care: A qualitative interpretive description study. *Geriatr Nurs* S0197-4572: 30201-30209. [Crossref]

26. Coker E, Ploeg J, Kaasalainen S, Carter N (2017) Nurses' oral hygiene care practices with hospitalised older adults in postacute settings. *Int J Older People Nurs* 12: e12124. [Crossref]

27. Grubbs V, Plantinga LC, Tuot DS, Powe NR (2012) Chronic kidney disease and use of dental services in a United States public healthcare system: a retrospective cohort study. *BMC nephrology* 13: 16. [Crossref]

28. Álamo SM, Esteve CG, Pérez MGS (2011) Dental considerations for the patient with renal disease. *J Clin Exp Dent* 3: e112-e119.