

Original paper

Prevalence of Xerostomia in Patients with Chronic Hemodialysis in Babil City

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Abstract

Background: Xerostomia is as a subjective complaint of dry mouth that may result from deficient production of saliva. It may be caused by reduced salivary flow secondary to atrophy and fibrosis of the salivary glands, use of medications, restriction of fluid intake and old age. In patients undergoing hemodialysis, xerostomia is associated with difficulties in chewing, swallowing, tasting and speaking; increased risk of oral diseases.

Aim of the study: The aim of this study was to find the prevalence of xerostomia in chronic hemodialysis patients in Babil- Hilla, and compare it with healthy controls.

Materials and Methods: Forty three subjects were incorporated in this study, with end stage renal disease and undergoing hemodialysis , they were already diagnosed by a nephrologist specialists, all these patients are without any other systemic diseases. Healthy control group, forty control subjects with no signs and symptoms of any systemic disease. They were sex and age matched to hemodialysis patients.

Results and Discussion: A total of 43 patients were registered in Merjan teaching hospital in Babil- Hilla. These patients on hemodialysis programs at the beginning of the study, from February to April, 2013. They were (20) males and (23) females and the age range (24- 69) years. Xerostomia was recorded in 69.767% (n=30) of all patients with hemodialysis. Our data involved mostly xerostomia was recorded in patients with hemodialysis, in these patients due to presence of xerostomia increased the poor oral hygiene. Dysgeusia and uremic fetor, bad odor and taste are caused not only by xerostomia but also by the presence of urease-splitting oral organisms, which metabolize urea (present in high levels in these patients) and thus elaborate ammonia. Patients with xerostomia are at increased risk of lesions to the mucosa, gingival, and tongue, as well as candidiasis, dental caries, periodontal disease and other bacterial and fungal infections. Many of these conditions either cause inflammation, or worsen the chronic inflammation that is frequently present in patients on hemodialysis, and consequently contribute to the risk of developing cardiovascular diseases.

Conclusions: Xerostomia remains a frustrating symptom for patients on hemodialysis, and further efforts should be made to identify effective treatments, restoration of the salivary function.

Keywords: xerostomia, end –stage renal disease, hemodialysis.

Introduction

Xerostomia is often defined as a subjective complaint of dry mouth that may result from deficient production of saliva. Most of xerostomic patient's complaints are oral dryness, burning mouth, increased thirst, loss of taste, difficulty of swallowing, chewing,

speaking, oral breathing, unpleasant taste and odor, sensitive teeth, gastroesophageal reflux, and malfunction of removable prosthesis¹⁻⁶. Accordingly, the evaluation of xerostomia is very subjective, because most of xerostomic patients have no pathology in salivary glands. Thus, xerostomia is often considered a

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psychological expression. However, through clinical oral evaluation is necessary⁷⁻¹⁴. Xerostomia can be found approximately in 4% to 29% of the general population, most commonly in women^{1,15-17}. Sometimes, when examining a xerostomic patient, first signs of oral candidiasis can be observed, caused by radical changes in immunological and microbiological status of the oral cavity^{18,19}. Often xerostomia is found in patients with a considerable number of caries-affected and missing teeth, filled surfaces (DMF and DMFs), and poor oral hygiene indexes^{20,21} despite proper maintenance of oral hygiene by the patient^{10,22-23}. Therefore, it appears that xerostomia is a polyetiological symptom, also caused by the use of various medications^{4,11}, by primary and secondary sjögren's syndrome (SS)^{1,21,24-26}, head and neck radiation therapy^{25,27} various homeopathies, diabetes mellitus, long-lasting stress, intense smoking, decreased masticatory function, aplasia or agenesis of salivary glands, cystic fibrosis, primary biliary cirrhosis. AIDS, HIV, Parkinson's disease, renal dialysis, immunosuppression, amyloidosis, hemochromatosis, E avitaminosis, or silicone breast implants^{9,29-30}. Research is conducted worldwide on the correlation of rheumatic diseases with xerostomia and patients' quality of life³¹. Patients on chronic hemodialysis experience a large number of physical and mental symptoms that reduce quality of life and impair their outcomes³²⁻³⁹. Xerostomia is associated with difficulties in chewing, swallowing, tasting and speaking⁴⁰⁻⁴². In addition, xerostomia contributes to excessive fluid intake and interdialytic weight gain (IWG), as well as to the development of oral lesions and infections⁴⁰⁻⁴³. Xerostomia is often underestimated by nephrologists, as demonstrated by the fact that few

studies have been published about the prevalence, pathogenesis, and related outcomes of this symptom in patients kidney disease and those receiving hemodialysis⁴⁰⁻⁴⁷. Notably, most studies that have evaluated the symptom burden in patients on hemodialysis did not assess the presence of xerostomia³²⁻³⁹. Xerostomia has a wide ranges in prevalence observed in the general population and in patients undergoing hemodialysis might result from the different definitions and various modalities that have been, and still are used to assess patients for the presence of xerostomia (each modality uses a different set of criteria, with varying sensitivities, to diagnose xerostomia). Xerostomia is a multifactorial phenomena and various contribute to its development.

In general population, the rate of saliva flow is on average 0.3-0.5 ml/min (range 0.008- 1.850 ml/min)⁴⁹. An unstimulated salivary flow rate of at least 0.1-0.3 ml/min is thought to be needed to avoid the development of xerostomia⁵⁰. Numerous studies have demonstrated that salivary flow is significantly decreased in patients receiving hemodialysis;^{44,51-56} their salivary flow is typically reduced by 20-55% compared to controls, but in some individuals on hemodialysis severe hyposalivation (rate of saliva flow <0.1 ml/min) or no measurable salivation has been observed. One of the most important studies corroborated these findings and demonstrated that saliva production and excretion is significantly lower in the parotid glands of patients undergoing hemodialysis compared with healthy individual⁵⁷. Further investigation, however, has clearly demonstrated that xerostomia is caused by or associated with a significantly decreased unstimulated salivary flow rate⁵⁸. Notably, after renal

transplantation, the salivary flow rate increase significantly (from 0.30 ± 0.21 ml/min to 0.44 ± 0.29 ml/min) while the level of xerostomia and thirst decreases; as yet, there is no definitive explanation for these findings⁴⁵.

Materials and Methods

Forty three subjects were incorporated in this study, with end stage renal disease and undergoing hemodialysis, they were already diagnosed by a nephrologist consultant all these patients are without any other systemic diseases. Healthy control group, forty control subjects with no signs and symptoms of any systemic disease. They were sex and age matched to hemodialysis patients. All control and patient groups were with no periodontal disease. Patients were selected from the nephrology department of Merjan teaching hospital in Babil – Hilla, from February to April, 2013. Informed consent and ethical approval was obtained. For each individual a questionnaire case sheet was filled out. Approval for this study was obtained from director or manager of this hospital. A noninvasive oral examination was obtained from hemodialysis registered in a dialysis program at the hospital as of February 1, 2013. A questionnaire regarding patient characteristics was administered by nephrologists. Information gathered from the medical chart included the patient's age, duration of dialysis, dialysis modality. Medication history, including the use of acetylsalicylic acid, nonsteroidal anti-inflammatory drugs, warfarin, antihypertensive, immunosuppressive, was recorded.

Results

A total of 43 patients were registered with the Merjan teaching hospital in

Generally, the reduced salivary flow observed in patients undergoing hemodialysis might be caused by alteration in the salivary glands, use of certain medications, fluid intake restriction and possibly old age.

Babil- Hilla. These patients on hemodialysis programs at the beginning of the study, from February to April, 2013. They were (20) males and (23) females and the age range (24- 69) years. Xerostomia was recorded in 69.767% (n=30) of all patients with hemodialysis.

Discussion

Previous studies have suggested that the oral hygiene of hemodialysis patients is worse than that of the general population. Our data involved mostly xerostomia was recorded in patients with hemodialysis, in these patients due to presence of xerostomia increased the poor oral hygiene, these results matched with Locsey and others, 1986, reported greater calculus formation, gingivitis, caries, atrophy of the alveolar bone, pathologic mobility proportional to bone resorption and tooth loss, pocket formation and necrotic teeth found under crowns, bridges and fillings, these dental findings in this study were consistent significant attrition, recession, gingivitis and accumulation of plaque, these findings and high frequency of attrition may be related to xerostomia and aging.

Xerostomia is related to overall volume status of patients who are discouraged from drinking excess fluid. Dysgeusia and uremic fetor, bad odor and taste are caused not only by xerostomia but also by the presence of urease-splitting oral organisms, which metabolize urea (present in high levels in these patients) and thus elaborate ammonia.

Bots, et al., who stated that traditionally, xerostomia has been associated with the fluid intake restrictions imposed on patients undergoing hemodialysis. Indeed, no studies, to our knowledge, have compared the severity of xerostomia immediately before and after hemodialysis. Surprisingly, salivary flow is higher after completion of hemodialysis sessions than before the start of sessions. In addition, hemodialysis has a transient stimulatory effect on the saliva flow rate, with the unstimulated whole salivary flow increasing from 0.30 ± 0.22 ml/min before hemodialysis to 0.39 ± 0.25 ml/min during the procedure. However, even after this stimulatory effect of hemodialysis, salivary flow remained below normal in these patients; this study was matched with our study.

The decrease in the flow of saliva, as in patients with xerostomia, lead to changes in the composition of saliva. When compared with saliva from a control group of healthy individuals, the saliva from patients on hemodialysis had increased viscosity, increased concentration of urea, sodium, phosphorus, potassium and total protein, decreased levels of calcium, increased PH and reduced buffering capacity⁵⁴⁻⁵⁶. These changes contribute to the development of dental problems and, possibly, to the feeling of dry mouth. Low viscoelastic properties of saliva have been associated with xerostomia⁵⁴⁻⁵⁶. Xerostomia is associated with a number of important clinical consequences, including difficulties in chewing, swallowing, and speaking,⁴⁰⁻⁴⁶ that adversely affect patients' daily the success of hemodialysis treatment. Patients with xerostomia are at increased risk of lesions to the mucosa, gingival, and tongue, as well as candidiasis, dental caries, periodontal

disease and other bacterial and fungal infections⁴⁰⁻⁴⁵. Many of these conditions either cause inflammation, or worsen the chronic inflammation that is frequently present in patients on hemodialysis, and consequently contribute to the risk of developing cardiovascular diseases⁵⁹.

Oral halitosis is frequently caused by overgrowth of several species of oral bacteria on the dorsal surface of the tongue that produce volatile sulfur compounds^{61,62}.

Hyposalivation can result in changes to the composition of the microflora, thereby causing or worsening oral halitosis⁶².

In general, xerostomia has adverse effect on the health status of an individual and their perception of well-being, and is associated with a sensation of embarrassment and discomfort⁶⁴. Research in patients on hemodialysis has demonstrated that xerostomia has a negative influence on their quality of life⁶³.

Conclusions

Xerostomia remains a frustrating symptom for patients on hemodialysis, and further efforts should be made to identify effective treatments, restoration of the salivary function through salivary gland regeneration, tissue engineering and gene therapy could be potential therapeutic options in patients undergoing hemodialysis, as they are in radiation –induced xerostomia and sjögren syndrome. These approaches, therefore, should also be considered in this population of patients.

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