

XEROSTOMIA – AN ANXIETY IN DIAGNOSIS AND MANAGEMENT

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Abstract

Xerostomia is dry mouth caused due to reduction or absent salivary secretion. This reduced saliva can result from various systemic diseases also in elderly individuals. As saliva plays major role in maintaining oropharyngeal health, reduced salivary secretion end up in transient and permanent oral disorders. Oral disorders cause burning sensations and increased tendency for dental caries. Our article concentrates on effect of xerostomia on oral health and provision of modified dental care thereby improving the comfort as well as oral functions.

Keywords:

*xerostomia, salivary
dysfunction, oral dryness.*

Introduction

Xerostomia is defined as dryness of mouth which can result from reduced or absent salivary flow¹. Approximately 500 mL of saliva is produced every day which vary considerably based on the requirement. The unstimulated and stimulated salivary flow rate is 0.3 mL/min, and 4.0 to 5.0 mL/min respectively². Salivary glands are classified as major and minor salivary glands. The major salivary glands comprise of the parotid salivary glands produce the serous saliva, and the submandibular salivary glands produce the mucinous saliva. In addition, the numerous minor salivary glands within the oral mucosa are important for lubrication required for speaking and increased production of salivary immunoglobulin A (IgA), which has immune functions. The minor salivary glands produce approximately 10% of the saliva but approximately 25% of the salivary IgA^{3,4}.

Saliva has an important role in maintaining the oral health. Individual's quality of life is impaired due to salivary dysfunction. Neutral pH of the oral cavity is maintained by normal salivary flow and the presence of calcium and phosphate ions in it, helps to remineralize teeth². Saliva has various functions including lubrication, swallowing, speech and local antimicrobial activity. 30% of the population above the age 65 suffers from Xerostomia associated with salivary gland dysfunction. Other causes include Systemic diseases, radiation therapy and medications¹. With advanced treatment modalities especially the radiotherapeutic management of head and neck malignancies, patients with xerostomia are commonly encountered in clinical practice. Hence identification and palliative management of these cases is essential.

Etiology

Drug-induced xerostomia is considered to be the most common type⁵. There are at least 500 medications associated with xerostomia which includes tricyclic antidepressants, antipsychotics, benzodiazepines, atropinics, beta blockers, antihistamines, hydralazine, busulfan, quinidine sulfate, and thiabendazole^{6,7,8}. Xerostomia is caused due to an anticholinergic or sympathomimetic action; Drug induced xerostomia occurs commonly in elderly patients taking multiple medications⁹. Radiotherapy administration in the management of oral cancer can affect salivary flow rate during initial period and the flow rate eventually ceases and recovery becomes difficult. Chemotherapy includes paclitaxel, carboplatin, and infusion 5-fluorouracil with concurrent radiation can frequently cause xerostomia¹⁰.

Disorders of the salivary glands includes Sjogren's syndrome a multisystem immune-mediated disorder where in there is inflammation of exocrine glands results in xerostomia, xerophthalmia, and an associated connective tissue disorder. Other causes of xerostomia Sarcoidosis, HIV disease, HCV infections, Primary biliary cirrhosis, cystic fibrosis, and diabetes mellitus rarely cause xerostomia, as do salivary gland agenesis, with or without ectodermal dysplasia; triple-A syndrome; amyloidosis; and hemochromatosis¹⁰.

Many older individuals reports with dry mouth for a variety of reasons⁵. Systemic diseases and their treatments, numerous medical conditions, medications, radiotherapy and chemotherapy can cause salivary gland diseases⁵. Medication-induced xerostomia is common in elderly people as they are more likely to take medications than others. Quality and quantity of salivary secretion are affected in those patients who are under drugs which inhibit neurotransmitters from binding to receptors of salivary gland membrane. External beam radiation therapy causes permanent salivary gland damage leading to xerostomia^{11,12}. Chemotherapeutic agents cause transient xerostomia but salivary function returns to prechemotherapy levels after therapy is completed¹³.

Clinical features

Oral manifestations

Dry lips and mouth commonly associated with altered taste and difficulty in swallowing. Dry mouth may result in increased bacterial plaque accumulation leading to gingivitis, periodontal diseases and halitosis³. There is increased susceptibility to oropharyngeal candidiasis. Dry mouth also causes difficulty in denture wearing and mastication problems. Nocturnal oral discomfort is common because salivary flow is at lowest circadian level during night.

Gustatory receptors are stimulated by saliva so absence of saliva alters taste sensation. Liquids are required to make easy swallowing of dry foods. Halitosis, burning mouth as well as tongue and spicy foods intolerance has been reported⁵. Salivary hypofunction make the mucosa susceptible to candidiasis and can cause dental caries. Salivary gland enlargements are frequent presentations in SS and can be associated with or without an accompanying infection.

Diagnosis

A series of clinical, radiologic, and laboratory-based tests are included in the investigation of xerostomia. Patient's history, examination of oral cavity and measuring the flow rate of saliva plays a major role in diagnosis¹⁴. Various methods are available to identify the associated pathology which includes sialography, scintigraphy, minor and major salivary gland biopsy.

Unstimulated whole salivary flow rate exceeds 0.5 mL/min in healthy individuals; levels of < 0.1 mL/min are considered abnormal⁵.

Treatment

Management of xerostomia requires a multidisciplinary approach because many patients have medical problems and pharmaceutical complications. Dental examination scheduled frequently to assess oral complications of xerostomia¹⁴.

Depending on salivary dysfunction and severity of dental caries topical fluorides and antimicrobial mouthrinses can be advised¹⁵. Loss of normal salivary secretion can produce demineralization of enamel and prescribing remineralizing solutions will aid reducing such effects on the tooth structure¹⁶. Frequent dental visits and emphasis on oral hygiene is mandatory to maintain good dental health. In case of oral infections due to candidiasis, antifungal therapies should be considered.

Artificial simulants of saliva along with moisturizers and humidifiers can be advised. Patients should be instructed to take adequate fluids while eating to make swallowing comfortable, also patients advised to sip water frequently to retain moisture in oral cavity. Stimulation techniques like sugar-free chewing gum, candies and mints are helpful for patients who are left with viable salivary gland tissue¹⁶. Dry mucosa is more sensitive to irritation therefore patients should be instructed to avoid products with alcohol, sugar, or strong flavorings¹⁷. Lubricating agents in various can be used to relieve the symptoms of xerostomia associated with radiation or SS.

Patients with xerostomia have increased risk for dental caries therefore should be cautioned not to take sugar containing sweetener. Several techniques are there for salivary flow stimulation which includes chewing gums or mints can be effective in relieving symptoms¹⁸. Electrical stimulation of tongue and palate has been described and the effect was considered to be modest in xerostomia patients. Mucin spray can be useful in patients who had undergone irradiation. Results of few studies reported that a regimen of 3 to 4 weekly acupuncture treatments followed by monthly sessions showed sustainable increase in salivary flow rates with symptomatic improvement of those with Sjogren syndrome¹⁹.

Vitamin supplementation, evening primrose oil which rich in fatty acids can cause increase in unstimulated salivary flow with Sjogren syndrome. Drug-induced xerostomia shows benefit from chewing cappuccino coffee, but reported to be only temporary improvement. Linseed extracts Salinum with or without chlorhexidine is considered to produce positive effects on symptoms of patients¹⁹.

Systemic secretagogues include pilocarpine hydrochloride (HCl), anetholetrithione, and cevimeline HCl. **Pilocarpine HCL** indicated for patients with oral dryness resulting from radiotherapy which increases salivary flow by stimulating viable salivary gland tissue^{20,21}. Pilocarpine increases salivary output rapidly reaching the maximum within 1 hour. Prescribed doses of the drug are 5.0 to 7.5 mg, given 3 or 4 times daily and it is contraindicated in cardiovascular disease, respiratory diseases, glaucoma, or urethral reflux. **Anetholetrithione** has been shown to increase salivary flow in patients with mild salivary gland hypofunction and adverse effects are reported to be mild. **Cevimeline**, 30 mg 3 times daily increased salivary flow also improved the subjective and objective symptoms of xerostomia patients associated with SS²⁰. Cevimeline should be used in caution with patients who report of cardiovascular diseases, pulmonary diseases, glaucoma or disease of gall bladder and also in patients under various medications. **Bethanechol**, **Carbacholine**, **Pyridostigmine** of benefit in the treatment xerostomia, but good published confirmatory data is insufficient²².

Intramuscular (eg, 1 10⁶ IU/ wk) and parenteral (3 10⁶ three times weekly) interferon alpha administration can increase the salivary secretion of patients with primary and secondary SS²³. However wide range of adverse effect can limit the use of systemic administration. Interferon alpha-containing lozenges (150 IU interferon alpha 3 times daily) can reduce the severity of xerostomia in primary and secondary SS after 9 weeks of therapy. **Corticosteroids** (prednisolone 30 mg on alternate days) may be beneficial for the management of early stages of disease^{24,25}. Other Systemic Therapies include azathioprine, cyclosporine, Cyclophosphamide, Thalidomide, zidovudine, hydrous crystalline maltose, Ambroxol, infliximab for which relevant clinical trials are inadequate¹⁰.

Conclusion

Saliva is important in maintaining oral homeostasis, function as well as maintenance of oral cavity in good health. So, if xerostomia is not diagnosed and managed at the earliest, it can significantly affect the patient's quality of life. Xerostomia in elderly patients have overlapping systemic conditions which can pose a diagnostic challenge. Hence diagnosis and the course of management lie solely on the oral physician.

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