ORIGINAL RESEARCH PAPER

Volume-8 | Issue-1 | January-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

XEROSTOMIA – AN UPDATE

Dental Science

Dr. K. Rajkumar MDS ,PhD Professor& Head Dept of Oral Pathology SRM Dental College Ramapuram

Dr. R. Ramya MDS Reader Dept of Oral Pathology SRM Dental College Ramapuram

Dr. R. Swarna Lakshmi* MDS Junior Research Fellow , Dept of Oral Pathology SRM Dental College Ramapuram*Corresponding Author

ABSTRACT

Dry mouth is referred to as Xerostomia. It occurs due to decreased salivary flow into the oral cavity. It has a significant effect on the quality of patient's life, affecting dietary habits, nutritional status, speech, taste, decreased tolerance to dental prosthesis and increased susceptibility to dental caries. Ageing causes significant changes in the morphology and function of salivary glands. Saliva plays a paramount role in lubrication, defense and protection role in the oral cavity. Difficulty in speech articulation, dry mouth, increased prevalence of infections, and alteration in taste perception occurs. The secretory capacity of salivary gland decreases as age increases. Salivary gland morphology is altered with replacement of functional acinar elements with fat and fibro vascular tissue. This article deals with overall review about xerostomia. The insights of the article will help the clinicians to have sound understanding of this condition, prompt diagnosis and monitoring of xerostomia patients in order to ensure proper treatment for these patients.

KEYWORDS

Dry mouth ,Xerostomia, decreased salivary flow

INTRODUCTION

Xerostomia is defined as dry mouth resulting from reduced or mere absence of salivary flow[1]. Xerostomia as such is not a disease; it's a symptom of various medical conditions, a side effect of radiation to the head and neck, or a side effect of wide variety of medications. Xerostomia may or may not be associated with decreased salivary gland function. Basic classification of xerostomia based on the pathogenesis is *true* xerostomia(primaria, xerostomia vera) due to malfunctioning of salivary glands or *pseudo* xerostomia or symptomatic xerostomia(symptomatica,xerostomia spuria) in which the patients have a feeling of dryness despite normal secretory function of salivary glands[2].The general incidence rate is 10-29%[3]. Apart from causing major inconvenience to the patients it affects every aspect of oral function in addiction to overall health and social problems.

Normal salivary function is mediated by the muscarinic M3 receptor. Stimulation of the receptor results in increased salivary secretion[4]. Saliva is a viscous, clear, watery fluid secreted from the salivary glands. There are two major types of protein secretions, a serous secretion containing the digestive enzyme ptyalin and a mucous secretion containing the lubricating aid mucin. Saliva also contains large amounts of potassium and bicarbonate ions, and to a lesser extent sodium and chloride ions. In addition, saliva contains several antimicrobial constituents, including thiocyanate, lysozyme, immunoglobulins, lactoferrin and transferrin.The pH of saliva falls between 6 and 7.4. Major functions of the saliva are Lubrication, Digestion,Anti-microbial property and anti-cariogenic property[5].

Pathophysiology

Major portion of the saliva i.e. 90% is produced by the three paired salivary gland namely; parotid, submandibular and sublingual. The remaining 10% of saliva is produced by numerous minor salivary glands which line the mouth and pharynx.

The salivary glands are innervated by the parasympathetic and sympathetic nerve fibers. Parasympathetic stimulation is vital and results in heavy secretion and sympathetic stimulation results in small amount of thick, mucinous saliva[6].

To understand the etiology and management of xerostomia, basic knowledge about physiology of saliva production is very essential.

Mucin and water content present in the saliva constitutes the lubricant property and prevents epithelial dehydration and facilitates chewing, swallowing, taste and speech. Salivary flow helps in washing away food particles and the bacteria which thrive on them. Also saliva protects esophagus by buffering refluxed gastric acids.

Xerostomia as such is not a disease. It has profound effects on the quality of life of the patients. Signs and symptoms are listed in table 1.

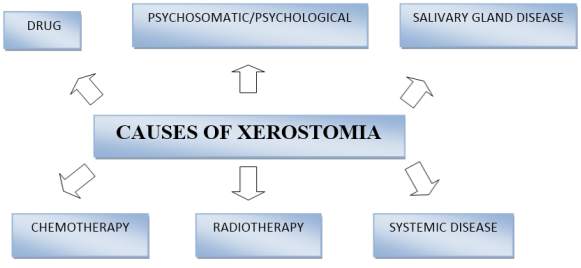

FIGURE 1: Causes of Xerostomia

ETIOLOGY OF XEROSTOMIA

There are a number of causes of which the most common are radiation therapy, drugs and systemic diseases. The major causes are depicted in figure1.Apart from these; numerous nonspecific causes are also present.

Numerous drugs predispose to xerostomia .In fact it is even said that there is positive correlation between the total number of drugs taken. Drugs which cause xerostomia are listed in Table2.Literature revealed that patients taking more number of drugs are more prone to develop xerostomia. However the effect is temporary and will reverse if the medication is discontinued[13,19].

Radiation therapy of the head and neck leads to irreversible xerostomia that occurs during the course of treatment mainly due to destruction of the salivary glands. Sjogrens syndrome is the commonest disease affecting the salivary gland. Also patients with rheumatoid arthritis develop dry mouth[13].

Other nonspecific causes are mouth breathing, nasal destruction, stress anxiety, smoking etc.

TABLE 1 [9,10]

S.NO	SIGNS AND SYMPTOMS OF XEROSTOMIA
SIGNS	
1.	Dry, cracked and peeling lips
2.	Dry and coarse tongue
3.	Cracks in the corners of the mouth
4.	Dental decay, cervical or atypical (incisal and cusp areas)
5.	Dental erosion
6.	Erythematous tongue
7.	Swelling of the salivary glands

8.	Mucositis
9.	Oral candidiasis
10.	Oral ulcers
SYMPTOMS	
1.	Difficulties while swallowing and chewing dry foods
2.	Sensitivity to spicy foods
3.	Altered,salty,bitter and metallic taste in mouth
4.	Burning sensation
5.	Lack of taste perception
6.	Pain in the salivary glands
7.	Coughing episodes
8.	Voice disturbances/Speech difficulties
9.	Increased liquid intake
10.	Nocturnal discomfort

TABLE 2 : [2,7,8] DRUGS ASSOCIATED WITH XEROSTOMIA

Diuretics	Chlorothiazide, Hydrochlorothiazide
Antidepressants	Amitriptyline,Imipramine,Reboxetine, Bupropion Hydrochloride
Antihistaminic agents	Clemastine
Neuroleptics	Derivatives Of Phenothiazine, Butyrophenone, Thioxanthene
Bronchodilators	B2-Adrenomimetics,Inhalatory Glucocorticoids, Inhalatory Cholinolytics (Ipratropium)
Anxiolytics	Benzodiazepine Derivatives: Diazepam, Oxazepam, Lorazepam
Cholinolytic agents	Atropine, Homatropine, Scopolamine
Hypotensive agents	Angiotensin-Converting Enzyme Inhibitors: Enalapril, Captopril, Lysinopril, Perindopril
Opioids	Morphine, Codeine, Methadone, Pethidine
Immunostimulants	Interferon-Alpha
Appetite suppressants	Sibutramine
Ant migraine drugs	Rizatriptan

TABLE 3: Consequences and complications of xerostomia[10]

Dry mouth
Thirst
Difficulties in oral function
Dysphagia
Taste disturbances
Altered speech
Difficulties wearing denture
Mucosal changes
Injuries of oral mucosa
Oropharyngeal burning
Mucus accumulation
Food retention in the mouth
Plaque accumulation
Hypo salivation associated caries
Changes in oral microbial flora
Oropharyngeal infections
Fungal infections
Nocturnal oral discomfort

METHODS OF ASSESSING XEROSTOMIA:

SUBJECTIVE

- Detailed history about the dryness
- Questionnaire to enquire about the following
- Frequency of sips of water at night or with meals
- Speaking difficulty
- Oral soreness
- Altered taste
- Sticking of food to the teeth
- Chewing difficulty
- Medication used

OBJECTIVE

Clinical examination:

- Dryness of mucosa
- Dry and red fissured tongue
- Absence of sublingual salivary pool
- Dry and chapped lips
- Oral ulcers, candidiasis ,gingival inflammation - predispose to dry mouth

Absence of above signs does not mean there is adequate salivary flow further tests are required. However subjective feeling of dry mouth does not necessarily correlate with objective assessments.[11,12,13]

TESTS TO ASSESS THE SEVERITY OF XEROSTOMIA

Cracker biscuit test/ Wafer test :

The subject is asked to sit in a relaxed and upright position and not to speak. Patient is asked to swallow the residual saliva and a wafer is placed on the tongue at the centre .Patient is asked not to swallow or chew. The time of dissolution is measured from the moment when the wafer is placed on the tongue. With a resting period of about 5 min the test is repeated for three times. This test is inappropriate if the patient is anorexic or nauseated[14,15]

Unstimulated and stimulated sialometry

Sialometry evaluates the salivary flow rate before and after stimulation of the glands .the procedure is usually carried out at a set time of the day under standardized conditions[15]. There are numerous ways for saliva collection:

Low forced spitting:

The patient is asked to lean forward and unstimulated saliva dribbles into a pre weighed tube[15].

Carlson- Crittenden collector or Lashley cannula:

In this method the parotid gland secretion is drained directly into the device. The chamber is held in place at the stensen's duct orifice. The chamber is then weighed to determine the amount of saliva collected. This method is easy, painless, Quick and also noninvasive. This method can also be adapted to assess both submandibular and sublingual salivary gland function[16,17].

Cotton plug:

A cotton plug can be placed close to the internal gum margin under the tongue.

Salivette

This consists of three units: An inner cotton plug, a plastic container and a outer container.

Patient is asked to chew a dental cotton plug which is then sealed in a plastic container and placed in the outer container .The salivette is then centrifuged and saliva is collected in the outermost container.

Salivary scintigraphy

The uptake concentration and secretion of 99m technetium pertechnetate (99m Tc scan) is recorded with a gamma scintillation camera. This technique is limited to terminally ill patients[15].

Biopsy

Usually a biopsy from the lower lip is done .However it is a invasive procedure and inappropriate for terminally ill patients.

SUMMARY

Saliva plays a very important role for maintenance of oral health. Patient counseling and education plays a key role in management of xerostomia. It is reported to affect as many as 1 in 5 elderly patients, more common in women there is evidence that polypharmacy can increase the risk of xerostomia. Patients with xerostomia are at a greater risk of developing caries .Hence it is important for the clinicians to have sound understanding of this condition, prompt diagnosis and monitoring of xerostomia patients in order to ensure proper treatment for these patients.

Literature reveals patients with severe xerostomia have 2.3 to 4.9 more negative impacts on health. There is a strong correlation with life impacts such as sense of taste, feeling tense, difficulty in relaxing, being self-conscious etc. Hence diagnosis of xerostomia at the early phase is very essential also treatment can prevent the progression of severity and thereby aid in improving the quality of life of the patients.

REFERENCES

1. Wiener RC, Wu B, Crout R, Wiener M, Plassman B, Kao E, McNeil D. Hyposalivation and xerostomia in dentate older adults. The Journal of the American Dental Association. 2010 Mar 1;141(3):279-84.
2. Tanasiewicz TM. Xerostomia of Various Etiologies: A Review ofthe Literature.201625,1,199 - 206
3. Porter SR, Scully C, Hegarty AM. An update of the etiology and management of xerostomia. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004;97:28–46.
4. Nakamura T, Matsui M, Uchida K, Futatsugi A, Kusakawa S, Matsumoto N, Nakamura

K, Manabe T, Taketo MM, Mikoshiba K. M3 muscarinic acetylcholine receptor plays a critical role in parasympathetic control of salivation in mice. The Journal of physiology. 2004 Jul 1;558(2):561-75.
5. Pedersen AM, Bardow A, Jensen SB, Nauntofte B. Saliva and gastrointestinal functions of taste, mastication, swallowing and digestion. Oral diseases. 2002 May 1;8(3):117-29.
6. Rao PK, Chatra L, Shenai P, Veena KM, Prabhu RV, Kushraj T, Shetty P, Hameed S. Xerostomia: Few dry facts about dry mouth. Archives of Medicine and Health Sciences. 2014 Jul 1;2(2):190.
7. Scully CB. Drug effects on salivary glands: dry mouth. Oral diseases. 2003 Jul 1;9(4):165-76.
8. Radwan-Oczko M. Topical application of drugs used in treatment of oral lichen planus lesions. Adv Clin Exp Med. 2013 Nov 1;22(6):893-.
9. Soto-Rojas AE, Kraus A. The oral side of Sjögren syndrome. Diagnosis and treatment. A review. Archives of medical research. 2002 Mar 1;33(2):95-106.
10. Turner MD, Ship JA. Salivary secretion in health and disease. Singapore: Wiley-Blackwell; 2008.
11. Atkinson JL, Wu AJ. Salivary gland dysfunction: causes, symptoms, tJ re atAmenmt. Dent Assoc 1994; 125: 409-16.
12. McDonald E, Marino C. Dry Mouth. Diagnosing and treating its multiple causes. Geriatrics 1991; 46: 61-63.
13. Cooke C, Ahmedzal S, Mayberry J. Xerostomia—a review. Palliative medicine. 1996 Oct;10(4):284-92.
14. Sánchez‐Guerrero J, Aguirre‐García E, Pérez‐Dosal MR, Kraus A, Cardiel MH, Soto‐Rojas AE. The wafer test: a semi‐quantitative test to screen for xerostomia. Rheumatology. 2002 Apr 1;41(4):381-9.
15. Fox P. C, Van Der Ven, PF, Sonies, B. C. Weiffenbach, JM, and Baum, BJ, Xerostomia: evaluation of a symptom with increasing significance, J. Am. Dent. Assoc. 1985;110:519.
16. Aagaard A, Godiksen S, Teglers PT, Schiodt M, Glenert U. Comparison between new saliva stimulants in patients with dry mouth: a placebo‐controlled double‐blind crossover study. Journal of oral pathology & medicine. 1992 Sep 1;21(8):376-80.
17. Fox PC, Busch KA, Baum BJ. Subjective reports of xerostomia and objective measures of salivary gland performance. The Journal of the American Dental Association. 1987 Oct 1;115(4):581-4.
18. Niklander S, Veas L, Barrera C, Fuentes F, Chiappini G, Marshall M. Risk factors, hyposalivation and impact of xerostomia on oral health-related quality of life. Brazilian oral research. 2017;31.
19. Atkinson JL, Wu AJ. Salivary gland dysfunction: causes,symptoms, tJ re atAmenmt. Dent Assoc 1994; 125: 409-16.