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## RESEARCH ARTICLE

### Xerostomia: A common problem of the Geriatric Population

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#### Abstract

With the gradual increase in life span and a global increase in the proportion of the elderly population, importance of health and oral health care among elderly is increasing. Xerostomia is the subjective complaint of oral dryness. Xerostomia may lead to the development of angular cheilosis, mucosal ulceration and leukoplakia. It also causes significant problem in denture retention. Various studies reveal an association of xerostomia with increasing age and female gender. Two simple signs for the diagnosis of xerostomia are the 'lipstick' and 'tongue blade' signs. Current management of salivary dysfunction is directed at relieving symptoms, controlling the sequelae of hypofunction and stimulating the salivary function.

## INTRODUCTION

With the gradual increase in the life span and a global increase in the proportion of the elderly population, importance of health and oral health care amongst the elderly is increasing. Xerostomia is a common complaint found often among older adults, affecting approximately 20% of the elderly (Sultana N 2011) and more among females in the post-menopausal age (Veerasha K.L 2010).

Xerostomia refers to a subjective sensation of dry mouth; it is frequent, but not always associated with salivary gland hypo function (Sultana N 2011). The dry mouth is common during periods of anxiety, mouth breathing and with advancing age. Very rarely, children are born with missing salivary glands so called salivary gland aplasia or genesis (Sultana N 2011). Salivary disorders in the aging population usually are caused by systemic disease and their treatment (for example, anticholinergic medications or radiation therapy). Numerous medical conditions (such as Sjogren Syndrome, diabetes, Alzheimer's disease, dehydration), medications (both prescription and non-prescription), head and neck irradiation and chemotherapy can cause or contribute to salivary gland diseases (Turner M.D 2007, Shiboski CH 2007, Von B.I 2007) . The increase in xerostomia complaints among elderly people may be due to synergistic effects that occur when aging adults take multiple medications. The common causes of dry mouth are listed in table 1.

Table 1: Common causes of Xerostomia (Sultana N 2011, Veerasha K.L 2010, Fox PC 2001)

**Iatrogenic**

- Drugs
- Local radiation
- Chronic graft-versus-host disease

**Diseases of salivary glands**

- Sjogren's syndrome
- Sarcoidosis
- HIV disease
- Hepatitis C virus infection
- Primary biliary cirrhosis
- Cystic fibrosis
- Diabetes mellitus

**Rare causes**

- Amyloidosis
- Hemochromatosis
- Wegener's disease
- Salivary gland agenesis (with or without ectodermal dysplasia)
- Triple A Syndrome

Age and medication seem to play a more important role in individuals with objective evidence of hyposalivation, while female gender and psychological factors are important in individuals with subjective oral dryness (Fox PC 1996). Medication cause xerostomia by interfering with the transmission of signals at the parasympathetic neuro effector junctions, interfering with actions at the adrenergic neuro effector junctions, or causing the depression of the connections of the autonomic nervous system. Therapeutic doses of medications do not damage salivary gland anatomy and any damage is therefore reversible with discontinued use of xerogenic drugs (Sultana N 2011). The commonly used drugs that causes xerostomia are in table 2.

Table 2: Drugs causing xerostomia (Scully C 2003, Morganstein M W 2005, Gupta A 2006, Turner M.D 2007, Sultana N 2011, Fox PC 1996, Fox PC 2001)

**Drugs that directly damage salivary glands**

- Cytotoxic drugs

**Drugs with anticholinergic activity**

- Anticholinergic agents: atropine and hyoscine
- Antireflux agents: proton-pump inhibitors (e.g.- Omeprazole)

**Central-acting psychoactive agents**

- Antidepressants, including tricyclic compounds
- Phenothiazines
- Benzodiazepines
- Antihistamines
- Bupropion

**Opioids****Drugs acting on sympathetic system**

- Drugs with sympathomimetic activity (e.g.- ephedrine)
- Antihypertensives: alpha-1 antagonists (e.g.- terazosin and prazosin)  
alpha-2 agonists (e.g.- clonidine)  
beta blocker (e.g.- atenolol, propranolol) which also alter salivary protein

levels

**Drugs that deplete fluids**

- Diuretics

A common therapy for head and neck cancers is external beam radiation, which causes severe and permanent salivary hypofunction and results in persistent complaints of xerostomia (Turner M.D 2007). Radiation induced destruction of serous-producing salivary cells occurs via a process termed “apoptosis”. With one week of the start of irradiation (after 10 grays of radiation have been delivered), a patient’s salivary output declines by 60 to 90 percent, with no recovery occurring unless the total dose to salivary tissues is less than 25 Gy (Turner M.D 2007). Most patients receive therapeutic dosage that exceed 60 Gy, and their salivary glands undergo atrophy and become fibrotic. These patients experience a plethora of oral and pharyngeal side effects as a result of the salivary dysfunction (Gupta A 2006, Turner M.D 2007, Sultana N 2011)

**Signs & symptoms associated with Xerostomia** (Morganstein M W 2005, Gupta A 2006, Turner M.D 2007, Sultana N 2011)

Table 3: Sign & symptoms associated with xerostomia

- Dental caries
- Dysphagia
- Dysgeusia
- Difficulty in mastication
- Altered speech
- Dry mouth
- Poorly fitting prostheses
- Halotosis
- Oropharyngeal infections
- Oropharyngeal burning
- Mucus accumulation
- Food retention in mouth
- Plaque accumulation
- Changes in oral microbial flora
- Mucosal changes
- Taste disturbances

### Diagnosis

Diagnosis of hyposalivation is based on the patient’s history and clinical examination. Diagnosis may be facilitated by asking simple questions (Gupta A 2006) (Table 4) and by performing a test i.e. ‘Lipstick’ sign and ‘tongue blade’ sign (Shiboski CH 2007).

In the ‘lipstick’ sign, the presence of lipstick on the labial surfaces of the anterior maxillary teeth is indicative of reduced saliva that would normally wet the mucosa and aid in cleansing the teeth (Veeresha K.L 2010, Fox PC 1996, Ship JA 2002). In ‘tongue blade’ sign when a tongue blade is held against the buccal mucosa the tissue adheres to the tongue blade as it is lifted away in a dry mouth (Veeresha K.L 2010, Fox PC 1996, Ship JA 2002).

The major salivary glands should be palpated to detect masses and also to determine whether saliva can be expressed via the salivary ducts. The consistency of the secretion should be examined. The expressed saliva should be clear, watery and copious. Cloudy exudates may be a sign of bacterial infection. Distinct masses within the body of the gland should not be present and the consistency of the gland should be slight rubbery but not hard (Veeresha K.L 2010).

Table 4: Subjective evaluation of xerostomia (Gupta A 2006)

• Do you have difficulty in swallowing any food?	Yes/No
• Does your mouth feel dry while eating a meal?	Yes/No
• Do you sip liquids to aid in swallowing dry foods?	Yes/No
• Does the amount of saliva in your mouth seem to be too little?	Yes/No
• Does the amount of saliva in your mouth seem to be too much?	Yes/No
• Dryness of lips	Present/absent
• Dryness of buccal mucosa	Present/absent

**Management of Xerostomia** (Morganstein M W 2005, Gupta A 2006, Turner M.D 2007, Sultana N 2011, Veerasha K.L 2010)

1. Appropriate diagnosis
2. Nutritional goals- Biotene products, ingestion of sugar less fluids, using salix saliva stimulating tablets, chewing sugarless gum and use of saliva substitutes
3. Inductive treatment options- Neutral sodium fluoride tooth pastes, Cevimeline Yohimbine
4. Non- traditional treatment modalities- Acupuncture, electrical stimulators, saliva substitutes, saliva stimulants and dentifrices
5. Future treatment modalities- Gene therapy and Human interferon alfa IFN $\alpha$

## Conclusion

Managing patients with xerostomia is a challenge for oral health care professionals worldwide and will continue to be a problem due to increased longevity and the synergistic effect of older adults taking multiple medications. All together they complicate the oral health and impair the quality of life. Though a dry mouth is the commonest complaint of the elderly in clinics, it may be the tip of the iceberg, wherein a greater elderly population may not report to the hospitals. In the interest of providing quality life to the elderly, population screening of elderly should include screening for xerostomia which helps in the early detection and management.

Dentists are the people who first come across and identify the problem of xerostomia, hence the up to date knowledge of various aspects of xerostomia is essential. Through proper education, assessment, prevention, referral and appropriate treatment with the help of dental professionals can minimize xerostomia and its effect on dental health and quality of life in the affected patients.

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