Saliva and Oral Health

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Excerpt from Saliva and Oral Health—An Essential Overview for the Healthcare Professional

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The presence of saliva is vital to the maintenance of healthy hard (teeth) and soft (mucosa) oral tissues. Severe reduction in salivary output not only results in a rapid deterioration of oral health, but also has a detrimental impact on the quality of life for the sufferer.

An understanding of saliva and its role in oral health helps to promote effective oral health care among oral health care professionals of the problems arising when the quantity and quality of saliva decreases; this awareness and understanding is important to the prevention, diagnosis and treatment of the condition.

There is an extensive body of research into saliva and its function. It has been used to indicate an individual’s susceptibility to developing caries, it has also been shown to influence physiological and pathological changes which are mirrored in salivary gland function. The benefits of saliva as a diagnostic fluid is that it is easily available for collection and for subjective and objective analysis. It can be used to monitor the presence and levels of harmful microorganisms and ions.

The following article provides an overview of oral complications associated with salivary gland dysfunction, epidemiology, diagnosis, clinical implications and management of xerostomia.

Xerostomia and Salivary Gland Hypofunction

Saliva plays a significant role in the maintenance of oral-pharyngeal health. Subjective complaints of a dry mouth (xerostomia) and objective evidence of diminished salivary output (salivary gland hypofunction) are common conditions, particularly in medically compromised older adults. They can result in impaired food and beverage intake, a sundry of oral disorders, and diminished host defence and communication. Persistent salivary gland hypofunction can produce permanent oral and pharyngeal disorders and impair a person’s quality of life.

Global estimates of xerostomia are variable, and the condition is difficult to ascertain due to varying study design, different definitions, and usage of the term xerostomia and salivary gland hypofunction interchangingly, utilisation of different diagnostic criteria and salivary collection methods, and small sample sizes.

However, overall, the prevalence of xerostomia and salivary gland hypofunction increases with age and affects approximately 10% of adults aged 65 years and older.

There are multiple causes of xerostomia and salivary gland hypofunction, the most common associated with age, and the prevalence of these conditions increases with age. The prevalence of xerostomia is nearly 100% among patients who are autoimmune eczsymptogenicity affecting between 1-4% of older adults. Estimates of the prevalence of xerostomia in adult ambulatory and nursing home populations range from 16-72%.

Concomitantly, many of the symptoms that are commonly associated with xerostomia are with other general medical conditions, such as diabetes. In all conditions, the medications often prescribed for their manage- ment could impact the structure and function of salivary glands leading to complaints of xerostomia. In addition, associated with salivary gland hypofunction.

Diagnosis of xerostomia and salivary gland hypofunction

Subjective responses and questionnaires

The establishment of a diagnosis of xerostomia is subjective and rely on patients’ complaints and can be advanced with the use of questionnaires. It should be noted that a patient’s presenting complaint may not be dry mouth in one or more of the presence of salivary gland hypofunction. Therefore, lack of complaint should not be perceived as adequate saliva secretion. Many of the common oral symptoms and signs are associated with xerostomia: altered taste, difficult eating, chewing, and swallowing, particularly dry foods, and especially without drinking accompanying liquids. Patients who complain of impaired denture retention, halitosis, reflux, stomato- dynia, and intolerance to acidic and spicy foods are likely to have xerostomia as well. Xerostomia is also common, since saliva output normally reaches its lowest circadian level during the second interval. At five minutes, the person is instructed to expectorate the remaining saliva into the container. The volume is recorded gravimetrically, and expressed as ml/min.

Stimulated whole salivary flow rates below 0.5 ml/min are also considered to be suggestive of salivary hypofunction. The most frequent procedure for collecting this form of saliva is with the use of a standard piece of paraffin wax or gum base (typical 1.2 g). A test tube or similar container with the paraffin or gum base is weighed prior to saliva collection. The person is instructed to swallow a small saliva sample that may be in the mouth before the saliva collection begins. The weight of the person is recorded, and saliva is collected for 5 minutes. The saliva is weighed prior to the collection, and the collection is completed. The volume is recorded gravimetrically, and expressed as ml/min.

Values below 45% of normal levels can be used for a diagnosis of salivary gland hypofunction. It is also generally accepted that when normal salivary flow rates are decreased by about 50%, patients will begin to experience xerostomia.

Caries lesions can develop on the lips that are frequently colonised with Candida species (angular cheilitis). Visible and palpable white plaques that occur secondary to salivary in- fections and obstructions (e.g. bacterial biofilm and Sjögren’s syndrome). A swollen parotid gland can displace the tongue and extend inferiorly over the angle of the mandible, whereas an enlarged subman- dibular gland palpated medially to the posterior-inferior border of the mandible.

There are numerous introral complications associated with xerostomia and salivary gland hypofunction.

Oropharyngeal surfaces become desiccated and easily friable, causing increased occurrence of white plaques and papillae and will appear dry, erythemic, and raw with an ir-ritated mucosal surface. Mucosal tissues are susceptible to de- veloping microbial infections, the most common being can- didiasis. This intraoral fungal infection manifests itself as ery- thematous candidiasis and pseudomu- cuous candidiasis, which produce white or slightly yellow furred mucosal surfa- ces. Clinicians can also observe the presence of white plaques in the anterior floor of the mouth.

A second frequent problem is dental caries that occurs both on coronal and root surfaces. New carious lesions can develop on these surfaces not normally affected (e.g. incisal edges of anterior teeth are susceptible). This is particularly prevalent on the margins of ex- isting restorations. Eritiontx or nature of disease, remov- ing erosive protheses and unstimulated saliva secretion, which can produce dry mouth, chewing, swallowing, speech, and nutritional intake. Denture- bearing tissue trauma can occur from ery- thematous candidiasis and traumatic and painful lesions due to trauma to tissues.

Saliva Collection

Xerostomia associated conditions and their symptoms are often confused with oral health. Until recently, it has only been possible to measure salivary hypofunction by the use of a standard piece of paraffin wax or gum base at a rate of 60 chews/ minute. Without swallowing, the rate of saliva production is significantly less. The person is instructed to expectorate the remaining saliva into the container placed under the chin at each 60 second interval. At five minutes, the person is instructed to expectorate the remaining saliva into the container and the collection is completed. The volume is recorded gravimetrically, and expressed as ml/min.

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Oropharyngeal surfaces become desiccated and easily friable, causing increased occurrence of white plaques in the anterior floor of the mouth. In patients considered to be at risk, for developing salivary gland hypofunction, it would be useful to monitor salivary flow rates over time. Most investi- gators consider a diagnosis of salivary gland hypofunction if the saliva flow rate is less than 0.1 ml/min using standardised techniques, neutral pH, and glucose. This is probably more indicative of salivary gland hypofunction com- pared with the stimulated secretions, since saliva is produced under unstimulated conditions during most of the hours a person is awake. The most com- mon collection technique for

CAYSTOMIA AND SALIVARY GLAND HYPOFUNCTION

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Decay. Salivary hypofunction—associated root surface caries is a particular challenge to diagnose and treat and, there- fore, identification of patients at risk will need to be taken to preserve the dentition.

With deficient remineralisation, dental erosion is a more frequent occurrence in patients with salivary gland hypofunction. The effects of oral mucosal traumas of teeth occasionally receive great- efraction from both brushes and are susceptible to dental erosion. Occlusal and incisal surfaces of teeth frequently eroded and traumatic forces can also undergo greater loss of enamel and dentine when there is insuf- ficient saliva to permit remineraliser.

Gingivitis

The increase in salivary output during and immediately after eating, especially when foods and fluids assists in the lavage of the oral cavity and the removal of food particles from oral surfaces. Conversely, salivary gland hypofunction is frequently associated with developing microbial infections, particularly in interproximal re- gions and beneath denture sur- faces, and can cause gingivitis. Long-standing gingivitis may develop into periodontal disease and, therefore, all patients with chronic hyposialisation are at risk for developing gingival and periodontal problems.

Impaired quality of life

Many of the oral-pharyngeal sequelae of salivary gland hypofunction are not perceived by individuals. Such individuals may not be aware that they have a problem, or may not be aware of its severity. Individuals with severe xerostomia may not be able to accurately judge the severity of their symptoms and this may be particularly true of elderly individuals who have a decreased ability to judge their symptoms. Therefore, the primary dental problem in patients with salivary gland hy- pofunction is with the quality of life.”
(difficulty swallowing), and difficulty chewing food secondary to saliva gland hypofunction can lead to changes in food and fluid selection that compromise nutritional status. The speech and eating difficulties that develop can impair social interactions and may cause some patients to avoid social engagements. Dysphagia increases susceptibility to aspiration pneumonia and compromise of the lungs with Gram-negative anaerobes from the gingival salivus.10

Management of xerostomia and saliva gland hypofunction

The initial step in the management of xerostomia is the establishment of a diagnosis. This frequently involves a multidisciplinary team of health care providers who communicate effectively, since many patients have concomitant medical conditions and frequently experience complications of polypharmacy. The second step is scheduling frequent oral health evaluations due to the high prevalence of oral complications.11

Maintenance of proper oral hygiene and hydration (water is the drink of choice) are helpful. Several habits, such as smoking, mouth breathing, and consumption of caffeine containing beverages, have been shown to increase the risk of xerostomia. Limiting or stopping these practices should lessen the severity of dry mouth symptoms. A low-sugar diet, daily topical fluoride use (e.g. fluoride toothpaste and mouth rinses), antimicrobial mouth rinses, and use of sugar-free gum or candy to stimulate salivary flow, help to prevent dental caries.

Patients must be instructed on the frequent use of fluids during eating, particularly for dry and rough foods. Eating and swallowing problems secondary to saliva gland hypofunction can impair the intake of fibre-rich foods, restricting some older adults to a primarily soft and carbohydrate-rich diet. Accordingly, patients must be counselled on a well-balanced, nutritionally adequate diet and the importance of limiting sugar intake, particularly between meals.

If there are remaining viable saliva glands, stimulation techniques using sugar-free chewing gum, candies (sweets), and mints can stimulate saliva output. Chewing sugarless gum is an extremely effective and continuous sialogogue, since it increases salivary output and increases salivary pH and buffer capacity. Buffered xylitol-containing chewing gums or mints are often recommended, because xylitol has an anti-car- iogenic effect.

Conclusion

Saliva not only plays a pivotal role in the maintenance of a healthy homeostatic condition in the oral cavity, but contributes to one’s overall health and well-being. Components from saliva interact in different ways with the dentition to protect the teeth. Patients who lack sufficient saliva suffer from many oral diseases, of which caries is only one. To alleviate discomfort they are advised to use saliva stimulants and substitutes which have the function of lubricating the oral surfaces. Chewing sugar-free gum is increasingly being viewed as a delivery system for active agents that could potentially provide direct oral care benefits, as it promotes a strong flow of stimulated saliva.


References

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