XEROSTOMIA IN ORAL MEDICINE: UNDERLYING ETIOLOGIES, CLINICAL CONSEQUENCES, AND MANAGEMENT STRATEGIES

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Abstract: Xerostomia, or dry mouth, is a common condition that can occur when saliva production is reduced, although some people may feel dryness even with normal saliva levels. it is especially common in older adults and is often caused by medications, certain diseases, or treatments, such as radiotherapy to the head and neck. dry mouth can make everyday activities, particularly speaking, eating, and swallowing uncomfortable, and it can increase the risk of tooth decay and oral infections. diagnosis is based on both the patient's experience and clinical tests that measure saliva flow. management focuses on treating the underlying cause, relieving symptoms, and preventing complications. early recognition and proper care are important for maintaining comfort and oral health.

Keywords: Xerostomia, dry mouth, reduced saliva, oral health, cancer, radiotherapy, salivary gland, medications, bad breath, tooth decay, subjective symptoms, objective symptoms.

Xerostomia is defined as oral dryness, a condition resulting significantly from reduced saliva flow through the mouth. Xerostomia is referred to as a medical condition rather than being a serious disease, which may be the ultimate symptoms of various health problems [1]. Despite often being underestimated, Xerostomia can considerably influence oral health, nutritional condition, and overall quality of life. In clinical dentistry and oral medicine, it is important to differentiate between Hyposalivation (objective salivary gland dysfunction), [2] and Xerostomia (subjective feeling of mouth dryness). Although these terms are commonly treated as synonyms in everyday clinical practice, they actually refer to different conditions that do not always coincide; some patients may complain of a dry mouth sensation even when their salivary secretion rates are normal.

The prevalence of xerostomia varies considerably depending on the population studied and the diagnostic methods used. Overall, around 10–30% of the general population report symptoms of dry mouth. This rate rises notably with age, reaching over 40% in individuals older than 65, which is mainly linked to polypharmacy and a higher prevalence of chronic conditions [3,4]. Women tend to be affected more often

than men, a difference that is commonly associated with hormonal factors and a greater incidence of autoimmune diseases such as Sjögren's syndrome. Xerostomia is also particularly common in cancer patients, especially those receiving radiotherapy to the head and neck region, where up to 80% may develop salivary gland dysfunction that can be persistent or irreversible [5].

Xerostomia has a wide range of causes, although it most commonly arises as a side effect of medications, as a consequence of radiotherapy to the head and neck region, or in association with Sjögren syndrome. Many different drugs have the potential to disrupt normal salivary gland activity and produce oral dryness, and this effect is influenced by both the dosage and the concurrent use of multiple medications [6]. It has been estimated that more than 500 commonly prescribed drugs can reduce salivary flow, including antidepressants, antihistamines, antihypertensive agents, and anticholinergic drugs. These medications typically impair parasympathetic stimulation, which plays a critical role in salivary secretion [7].

Xerostomia often emerges in patients treated with radiotherapy for head and neck cancers, particularly when the main salivary glands are in the radiation area. Saliva production can fall quickly, dropping by about 50–60% after around 25–30 Gy, usually within the first week. It continues to decrease and typically reaches its lowest point within 2–3 weeks of treatment. [6] Another important cause of xerostomia is Sjögren syndrome, an autoimmune disease that mainly leads to dryness of the mouth and eyes. It is caused by long-term infiltration of lymphocytes into the salivary glands, which gradually results in fibrosis and a decline in saliva production. The condition is more common in women over 40 years of age. Its onset after the age of 65 is rare, and in elderly patients, dry mouth is more often related to normal age-associated decline in salivary gland function rather than true Sjögren syndrome. Primary Sjögren syndrome affects mainly the salivary and lacrimal glands, while secondary Sjögren syndrome develops alongside other autoimmune or connective tissue diseases, such as rheumatoid arthritis [6].

From a clinical point of view, xerostomia can be divided into temporary or permanent forms, and also based on its cause, such as drug-related, disease-related, or radiation-induced. This type of classification helps clinicians predict outcomes and choose appropriate treatment approaches. Individuals who complain of xerostomia often do not show clear signs of reduced salivary flow, as their symptoms may be caused by changes in the quality or amount of saliva rather than an actual decrease in its production.

Under normal physiological conditions, the stimulated salivary flow rate averages approximately 1.5–2.0 mL/min, whereas the unstimulated salivary flow rate is typically around 0.3–0.4 mL/min. A diagnosis of hyposalivation is established when the stimulated salivary flow rate decreases to ≤0.5–0.7 mL/min and the unstimulated

salivary flow rate falls to ≤0.1 mL/min [8].

Reduced saliva flow can cause several noticeable symptoms. People often feel a dry or sticky sensation in the mouth, and the saliva may become thick or stringy. Bad breath is also common. Many patients find it difficult to chew, speak, and swallow properly, and they may also experience a dry or sore throat and hoarseness. [9]

The tongue can look dry or cracked, and changes in taste are frequently reported. Wearing dentures may become uncomfortable because they do not fit as well without enough saliva for lubrication. Some people also notice that lipstick sticks to their teeth, which reflects reduced natural cleaning in the mouth. Saliva is important for oral health because it helps wash away food particles and sugars, neutralizes acids, and controls bacterial growth. When saliva production decreases, these protective effects are reduced. As a result,eating, tasting, and swallowing become more difficult, and digestion may also be affected [10]. Xerostomia can lead to several oral health problems. These include a higher risk of tooth decay, swelling of the parotid glands, and inflammation or cracking of the lips.

The diagnosis of xerostomia is based on both what the patient reports and what can be measured clinically. Subjective symptoms are usually evaluated using assessment questionnaires, such as the Xerostomia Inventory. At the same time, objective assessment is done by measuring saliva production through a method called sialometry. In general, a low unstimulated salivary flow rate of less than 0.1 mL/min and a stimulated flow rate below about 0.5–0.7 mL/min suggest reduced saliva production (hyposalivation). In some cases, further tests are needed. These may include imaging methods like ultrasound or scintigraphy to examine salivary glands, and sometimes a minor salivary gland biopsy. These additional investigations are especially useful when autoimmune diseases such as Sjögren's syndrome are suspected [7].

Management of xerostomia mainly focuses on reducing symptoms, preventing oral complications, and improving daily comfort. The first step is usually to identify and manage the underlying cause, such as medications, systemic diseases, or radiotherapy. Patients are advised to maintain good hydration and avoid habits like smoking, alcohol, and excessive caffeine, which can worsen dryness. Saliva substitutes and oral moisturizers can help provide temporary relief, while sugar-free chewing gum or lozenges may stimulate remaining salivary function. In suitable cases, drugs such as pilocarpine or cevimeline may be prescribed to increase saliva production, especially when salivary glands are still functional [6].

As Xerostomia is caused by different factors, its management should be broad and focused on both treating the underlying cause and relieving symptoms. It is also important to prevent further oral problems. Early detection, proper diagnosis, and personalized treatment can reduce its effects and help maintain normal mouth comfort and function.

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