Chapter 6
Xerostomia

ABSTRACT

Xerostomia is most commonly observed in patients treated with certain medications, those subjected to radiotherapy of the head and neck, or in individuals with Sjogren's syndrome. Although it mostly affects geriatric patients, xerostomia can be also observed in young individuals. This condition not only results from the physiological process of aging but is also associated with the number and type of medications administered in the treatment of various systemic conditions. Xerostomia is also a common manifestation in menopausal women due to estrogen deficiency. If it remains untreated, xerostomia can lead to nutritional deficiencies, decreased mood, and finally, depression. Treatment is long-term and requires a high level of patient motivation. Although no standard treatment guidelines are available, many treatment options exist: topical agents to alleviate and/or prevent xerostomia, systemic therapy, or newer devices. While systemic agents (pilocarpine or cevimeline) have been largely studied, new medical devices require large well-designed clinical trials.

INTRODUCTION

Xerostomia (also known as "dry mouth", "mouth dryness" and "oral dryness") is a subjective experience of dryness of the oral cavity resulting from insufficient saliva secretion or a complete lack of saliva (Wiener et al, 2010). Interestingly, patients complaining of xerostomia frequently do not show any objective sign of *hypo-salivation* and their symptoms may be

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secondary to qualitative and/or quantitative changes in the composition of saliva (van der Putten, 2011; Fox, 1985).

Saliva plays a vital role in maintaining oral health. Its main *component* is water, constituting 99% of its volume. Other components, comprising the remaining 1%, include inorganic salts of sodium, potassium, calcium and magnesium, and organic compounds, such as cholesterol, uric acid and proteins (enzymes) (Ship, 2002; Guzik, 2009). The normal minimal *unstimulated* salivary flow rate (uSFR) is 0.1 mL per minute, and the minimal stimulated salivary flow rate (sSFR) is 0.2 mL per minute. Maximal stimulated flow rate is 7 mL per minute. The 24-hour volume of salivary secretion has been estimated to range from 500 mL to 1,500 mL (Glore, Spiteri-Staines, & Paleri, 2009).

The *principal functions* of saliva include the following:

- Initial digestion of carbohydrates and fats by salivary amylase and lipase, respectively (Guzik, 2009);
- Lubrication, which is essential for taste, swallowing and speech;
- Anti-microbial activity, both anti-bacterial and anti-fungal activity through mucin, lactoferrin and lysosymes;
- Buffering activity and clearance, helping maintaining oral pH within the 6.8–7.2 range; this is achieved by a hydrogen carbonate and phosphate buffering system (Guzik, 2009; Pichór, 2008). Saliva also washes out foul-tasting substances from the mouth and neutralizes gastric juice to protect the oral cavity and esophagus (Guzik & Kamyszm, 2009);
- Protection / Immunity via its anti-microbial properties, formation of sero-mucous coating and excretion of many irritant agents and viruses;
- Maintenance of tooth integrity: Saliva forms a pellicle on the surface of the tooth to prevent wearing. The film contains mucins and proline-rich glycoprotein. The proteins within the salivary pellicle inhibit demineralisation and promote remineralisation by attracting calcium ions (Ship, 2002);
- Modulation of taste sensation by the taste buds within the lingual papillae;
- Tissue repair: Saliva can encourage soft tissue repair by decreasing clotting time, increasing wound contraction, production of growth factors and other regulatory peptides (Mandel, 1987).