**Sjögren's Syndrome and Oral Care of Patients**

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Running title: Sjögren's Syndrome patient Oral Care

**Abstract**

Sjögren's syndrome is a chronic autoimmune disease of unknown etiology, which mainly involves the infiltration of lymphocytes that produces chronic inflammation to destroy the body’s exocrine glands, such as lacrimal glands and salivary glands, as they gradually lose function to the replacement of these lymphocytes. Patient’s chief complaints may include dry eyes, dry mouth, and often accompanied other immune disorders such as rheumatoid arthritis. There is also sign of abnormal autoimmune antibodies in the serum. About 25% of patients show multiple affected organs in respiratory system, gastrointestinal system and nervous system, producing a wide range of clinical symptoms. The common oral symptoms of patients with the disease include caries, oral mucosa damage, chapped lips, desquamation, angular stomatitis, swelling of tongue, ulcers and recurrent Candidiasis infections.

Keywords: Schirmer's test; Dry eye syndrome (DES); Xerostomia; Damaged salivary glands; Sjögren's syndrome.

**Foreword**

Sjögren's syndrome is classified as primary and secondary for recurrences, each in about half of the reported cases[1]. Primary Sjögren's syndrome refers to the patient without other rheumatic immune disorders, while secondary Sjögren's syndrome will have combination of other immune diseases, especially it is also the most common rheumatic immune disease complicated by systemic lupus and rheumatoid arthritis[2-4]. Sjögren's syndrome is an autoimmune disease that invades exocrine glands and epithelial cells, commonly targeting salivary glands and lacrimal glands; thus, the most reported symptoms are dry mouth and dry eyes(figure 1, figure 2)[5]. The Schirmer's test involves determining the amount of secretion of tears by placing a piece of test paper on the inside of the lower eyelid for 5 minutes to be measured of its length of the moist part with a ruler[6,7]. If the length is less than 5cm, it is usually considered to have Sjögren's syndrome; but, with aging and other possible diseases that cause degeneration of the lacrimal gland function may also yield the same result. If so, then the physician may check whether the cornea is dry by confirming through a slit lamp or biomicroscope[8,9]. The diagnosis requires the exclusion of radiation treatment to the head and neck or the presence of hepatitis B or C.

**Introduction to Sjögren's syndrome**

 Mikulicz disease, officially known as Sjögren's syndrome, or referred to as Sicca syndrome, is a systemic autoimmune disease, first described by a Swedish ophthalmologist, Sjögren, in 1933[10]. It is caused by the destruction of salivary glands or lacrimal glands due to immune system attacks. The symptoms include dry mouth or dry eyes, where dry mouth is the result of the destruction of the salivary glands and the insufficient secretion of saliva, causing the patient’s mouth to be very dry[11]. Sjögren's syndrome is a systemic autoimmune disease, involving an inflammatory condition. It is currently known that the locus variation in *RBMS3* gene is the cause of alveolar bone necrosis in osteoporosis treated with diphosphate drugs. Also, gastroesophageal reflux increases the chance of alveolar osteonecrosis, given that patients of Sjögren's syndrome are prone to the reflux, too [12].

**Oral Care for Patients of Sjögren's syndrome**

 Current treatments are only supportive therapies to alleviate symptoms, such as artificial tears to moisture the dry eyes and immunosuppressive agents such as Cyclosporin to chronically treat the condition by suppressing the inflammatory response in the lacrimal glands to achieve normal secretion. Cevimeline and Pilocarpine, not only stimulate the secretion of saliva, but NSAIDs are also used to alleviate both muscular and skeletal pain[13]. For patients with other serious complications, steroids or other immunosuppressive agents, such as Methotrexate, can be used to treat rheumatoid diseases, and monoclonal antibodies or biologics currently in the research phase have proven to be effective, too. However, many patients often neglect dental treatment since due to the lack of saliva production, the oral cavity becomes conducive to the proliferation of many plaques[2,14]. Treatments include the use of topical fluoride products to protect enamel, and regular outpatient scaling to remove calculus. For pre-existing caries in this specific oral environment, they will easily affect deep into the pulp, that once the pulp is invaded, tooth extraction or root canal is required [15]. Unfortunately, in most cases, the condition has worsened to the point that the tooth cannot be filled, and root canal treatment is the only option.

**Conclusion**

 For patient’s diet, it is recommended for them to take more Omega-3 polyunsaturated fatty acids and rich in EPA and DHA. Omega-3 polyunsaturated fatty acids can reduce the systemic inflammatory response and help dry eyes, while there are plant nutrients consisting of antioxidants to enhance immunity to fight off the disease. For example, fruits, vegetables, or olive oil can help relieve symptoms such as oral pain and joint stiffness. Supplementing Omega-3 polysaturated fatty acids, folic acid, selenium and zinc can help repair the oral mucosa cells [16,17]. Patients with the syndrome are suggested to drink small sips of water regularly and use artificial salivary gland stimulants, or non-alcoholic mouthwash to keep their mouth moist. Patients should also have dental cleaning every 3 months (especially with the procedure being covered by the health insurance to remove dental calculus every 3 months) and ask the dentist to evaluate the oral or periodontal condition to discover and treat problems as soon as possible. Since mouthwash has many ingredients and functions that cannot be replaced by boiled water, including antibacterial function, lubrication function, digestive function, dental curing function, buffering function, and mucosal wound repair and healing function, so in addition to mouthwash, oral care is often needed.

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乾燥症與患者的口腔保健

摘要

乾燥症是一種病因不明的慢性自體免疫性疾病，主要表現為淋巴細胞浸潤產生慢性炎症，破壞身體外分泌腺體如: 淚腺和唾液腺，這些淋巴細胞替代腺體而逐漸失去分泌功能，患者的主訴可能包括: 眼乾、口乾，並常伴有其他免疫系統疾病，如類風濕性關節炎血清當中也常出現自體免疫抗體；大約25%的患者表現出呼吸系統、胃腸道系統和神經系統等多個器官受到侵犯，產生全身性廣泛的臨床症狀；乾燥症患者常見的口腔症狀有齲齒、口腔粘膜損傷、口唇乾裂、脫屑、口角炎、舌頭腫脹、潰瘍和反覆性念珠菌感染等。

關鍵詞：Schirmer氏測試、乾眼症(DES)、口乾、唾液腺受損、乾燥症候群。