



Review article

Burning mouth syndrome: A comprehensive review of literature

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ABSTRACT

Burning mouth syndrome a chronic oro-facial pain syndrome that affects many adults world over remains poorly understood and is one of the most important dental issues facing dentists worldwide. It is associated with many oral and systemic conditions. The treatment frequently involves medications and dentists should be able to evaluate, diagnose and properly manage these patients.

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1. Introduction

Burning mouth syndrome is an idiopathic burning discomfort or pain affecting people with clinically normal oral mucosa, in whom a medical or dental cause has been excluded [1–3]. Synonyms used to describe burning mouth syndrome include Glossodynia, Glosopyrosis, Stomatodynia, Stomatopyrosis, Sore tongue, and oral Dysaesthesia [4]. A survey in 48,500 people found that people with burning mouth also have subjective dryness (66%), take some form of medication (64%), report other systemic illnesses (57%), and have altered taste (11%) [5]. Many studies of people with symptoms of burning mouth do not distinguish those with burning mouth syndrome from those with other conditions, making results unreliable. Local and systemic factors (such as infections, allergies, ill-fitting dentures [6], hypersensitivity reactions [7], and hormone and vita-

min deficiencies [8–10]) may cause the symptom of burning mouth, and should be excluded before diagnosing burning mouth syndrome. The patient with a complaint of a burning sensation of the oral mucosa presents one of the most difficult challenges to a dentist. The Headache Classification Subcommittee of the International Headache Society defines this condition as “an intraoral burning sensation for which no medical or dental cause can be found” [11].

1.1. Incidence/prevalence

Burning mouth syndrome mainly affects women [12–14], particularly after the menopause, when its prevalence may be 18–33% [15]. One study found a prevalence of 4% for the symptom of burning mouth without clinical abnormality of the oral mucosa with the highest prevalence (12%) in women aged 60–69 years [5]. Reported prevalence in general population ranges between 1% [15] and 15% [12].

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2. Clinical presentation

The patient complains of burning pain involving the oral mucosa, most often the tongue, hard palate and/or lips. Usually the onset is spontaneous but at times there is a precipitating event such as dental treatment. There may be associated xerostomia, dysaesthesia and/or dysgeusia. It is considerably more common in women than men (33:1) and most often perimenopausal or postmenopausal women [16]. Burning mouth also often coexists with other chronic pain disorders [17,18].

2.1. Classification and subtypes

Different classification types have been proposed based on the daily fluctuations of the symptoms [19–21].

A	Type 1	Characterized by progressive pain, patients wake up without pain, which then increases throughout the day, affects approximately 35% of patients. This type may be associated with systemic diseases, such as nutritional deficiencies.
B	Type 2	The symptoms are constant throughout the day and patients find it difficult to get to sleep, represents 55%. These patients usually present associated psychological disorders.
C	Type 3	Symptoms are intermittent, with atypical location and pain. Constitutes 10% of patients. It seems that contact with oral allergens could play an important etiologic role.

A more pragmatic approach is proposed by Scala et al. [22], who organize burning mouth syndrome into two clinical forms:

A	Primary or essential/idiopathic burning mouth syndrome	The causes cannot be identified
B	Secondary burning mouth syndrome	Resulting from local factors or systemic conditions.

Thus, these idiopathic and secondary criteria form two different subgroups of the same pathology. Danhauer et al. [20] examined 69 patients with burning mouth syndrome with a mean age of 62 years, and a mean duration of pain of 2.45 years and found no differences between patients with primary and secondary burning mouth syndrome with respect to age, duration or intensity of pain and psychological profile. Differences with respect to treatment outcome were found, secondary burning mouth syndrome improved with treatment, while no positive results were found in the group with primary burning mouth syndrome.

2.2. Diagnosis

Criteria developed by Scala for the diagnosis of burning mouth syndrome [22]:

Fundamental inclusion criteria:	
1.	Daily and deep burning sensation of the oral mucosa (bilateral)
2.	Burning sensation for at least 4–6 months
3.	Constant intensity, or increasing intensity during the day
4.	No worsening on eating or drinking. The symptoms may improve
5.	No interference with sleep
Additional inclusion criteria:	
1.	Dysgeusia and/or xerostomia
2.	Sensory or chemosensory alterations
3.	Mood changes or psychopathological alterations

The diagnosis of burning mouth syndrome should only be established only after all the other possible causes have been discarded by systematic analysis of the patient. There are no specific diagnostic tests, thus the diagnosis is made in the absence of visible oral lesions such as erythema, erosions, depapillated tongue.

Other systemic diseases that can manifest symptoms similar to burning mouth syndrome should be considered like Sjögren's syndrome, diabetes, candidiasis, deficiencies of iron or vitamins. It is essential to obtain the detailed medical, dental and psychological history of the patients so as to gain information regarding medications that can produce xerostomia and the presence of para-functional habits. Other tests for the diagnosis include hemogram, glucemia, iron, folates, vitamin B₁₂, zinc, culture for the detection of candida.

2.3. Differential diagnosis

Flowchart for differential diagnosis of burning mouth syndrome (Fig. 1):

The diagnosis of burning mouth syndrome depends on exclusion of a detectable organic basis for the complaint. Therefore a number of local conditions must be considered and ruled out of which the commonest cause is local irritation. A rough prosthesis will irritate the tongue and cheeks. Contact hypersensitivity to dental materials has been suggested as one possible mechanism [23,24]. Caustic oral rinses or acidic foods can cause generalized oral mucosal irritation and hypersensitivity. Similarly, tongue or cheek biting habits will result in localized discomfort that can, on occasion, present as a burning sensation along with smoking [24,25]. Oral candidiasis is not an uncommon condition in this patient population. This can be a primary infection but most often is secondary to either local irritation or systemic predisposition. Although oral candidiasis most often presents as a white, red or mixed red/white lesion, sometimes there is little visible change. A direct smear is the ideal way to make this diagnosis rather than taking samples for microbiological culture as the organism, *Candida albicans* is commensal in most mouths. If candidiasis is suspected, a course of antifungal therapy, such as mycostatin, should be tried first. Various mucocutaneous diseases/disorders also need to be considered like lichen planus, lichenoid reactions, pemphigus and migratory glossitis. A visual clinical examination, possibly followed by biopsy will confirm or exclude these diagnoses. Similarly, viral diseases such as herpes simplex or zoster can result in symptoms that the patient interprets as a burning sensation. Although these will be clinically apparent when the lesions erupt, there can be a prodromal burning sensation. Although the pain of post herpetic neuralgia is usually much more severe, occasionally it can also present as a burning sensation on the oral mucosa. Nutritional, metabolic or endocrine disorders may also result in a burning mouth. This includes diabetes, hypothyroidism, iron or zinc deficiency and vitamin B complex deficiency, particularly vitamin B₁₂ (cobalamin). Vitamin B₁₂ deficiency is a common cause of macrocytic anemia (pernicious anemia). Serum vitamin B₁₂ levels will only identify 50% of patients with subclinical disease and therefore measurement of serum methylmalonic acid and homocysteine levels are recommended as a more sensitive method of screening for vitamin B₁₂ deficiency [26]. These are increase much earlier in a case of vitamin B₁₂ deficiency. Finally, patients with true xerostomia will complain of a burning mouth. This can be as a component of Sjogren's syndrome, a result of radiation therapy to the head and neck, a side effect of medication or just an age related decrease in salivary production, particularly the serous component. Thus the dentist should obtain a clear and detailed illness and medical/dental history as well as perform a thorough oral clinical examination including any laboratory studies indicated. A neurological examination can be useful although, unless there are marked deficiencies, the lack of baseline data can present a problem. If other causes of this symptom are ruled out and/or the patient fails to respond to a normal course of treatment a diagnosis of burning mouth syndrome is reasonable.

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