



Is it Burning in the mouth or is it Burning Mouth Syndrome?

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Burning Mouth syndrome is therefore an idiopathic condition, diagnosis of which is based on diagnosis of exclusion [1]. However, various conditions in the oral cavity cause 'Burning sensation' and are not related to 'Burning Mouth Syndrome.' In the lieu of this, it becomes important to distinguish the symptom burning from the syndrome. Burning mouth 'syndrome' refers to combination of symptoms seen in patients, this includes xerostomia, taste disturbances (metallic taste in mouth) and burning sensation. In absence of this triad, it is regarded as a symptom and not syndrome, which distinguishes the treatment protocol. Thus, it becomes very important to differentially diagnose the two.

The current review provides for various conditions in the oral cavity that mimic burning mouth syndrome but must be thoroughly distinguished to reduce the agony of pain and inability to eat in these patients.

Definitions

American academy of orofacial pain defines BMS as a burning sensation in the oral mucosa despite the absence of clinical findings and abnormalities in laboratory testing or imaging [2]. The International Association for the Study of Pain defines BMS as a burning pain in the tongue or other oral mucous membrane associated with normal signs and laboratory findings lasting at least 4 months to 6 months [3]. The International Headache Society in the International Classification of Headache Disorders, 3rd edition (beta version) (ICHD-3 beta)5 defines BMS as an intraoral burning or dysesthesia sensation, recurring daily for more than 2 hours per day over more than 3 months, without clinically evident causative lesions [4].

Terms such as glossodynia, glossalgia, stomatodynia, sore or burning tongue were previously used to describe BMS [5,6].

Prevalence

The prevalence of BMS has been reported between 0.7-15% in general population. Most seen in postmenopausal women, younger women may also be affected [7].

Clinical presentation of BMS

Symptoms vary from patient to patient. Onset is gradual or sudden, with no identifiable precipitating factors. In some cases, precipitating factors such as dental procedure, trauma, new pharmacological prescription, illness or stressful life event may be traced to considering the patient history. Pain is chronic since 4 to 6 months, pain is described as annoying, burning, scalding, tingling, sometimes itchy or numbing kind of pain. Mild to moderate levels of pain may be present, pain may cause disturbance in sleep, pain may intensify as the day progresses. Patients often complain of disturbance during eating, drinking, and speaking. Eating hot, spicy, acidic food/liquid or alcoholic beverages may tend to intensify the symptoms. Pain intensity may increase with stress, may be continuous or intermittent [8-12].

BMS usually occurs in the 5th-7th decade and is characterized by positive sensory symptoms (burning, pain, dysesthesia, hyperesthesia, regions involved are tongue (67.9%), anterior two-thirds of tongue may be most affected, mucosal surfaces such as palate, lip, buccal mucosa, floor of the mouth may be involved. buccal mucosa and floor of the mouth are less frequently involved. Pain may be bilaterally or unilaterally. Interestingly burning sensation in the anogenital and vulvodinia have been found coexisting with BMS symptoms [13,14].

Conditions that mimic BMS

Atrophic glossitis

Atrophic glossitis is characterized by a smooth, shiny appearance of the tongue secondary to loss of filiform papillae, this can be associated with burning sensation of tongue [15]. Tongue atrophy may be associated with nutrient deficiencies such as B-complex, Vitamin E, folate and iron. The initial presentation may only be atrophic glossitis or glossodynia. As also systemic conditions such as oral candidiasis, Sjogren's syndrome, Syphilis infection, Amyloidosis, Riley-day syndrome. This possibility of tongue depapillation being associated with depapillation may be associated with nutritional deficiencies is hypothesized due to higher turnover of tongue papillae, deficiencies in micro-nutrients may lead to cell proliferation or cell membrane stabilization further leading to depilation.

Deficiency of Vitamin B, B12, folate, Iron

Deficiency of Vitamin B 12 can result from dietary insufficiency (e.g., Strict vegetarian diet, malnourishment, alcoholics) or from malabsorption (as a consequence of bacterial overgrowth in gut, use of gastric acid lowering agents, autoimmune destruction of intrinsic factor) this may be asymptomatic or maybe present with hematologic, neuropsychiatric or gastrointestinal disturbances [16,17].

Candidiasis

Presence of burning may be typically associated with findings of atrophy, erythema, ulceration of oral mucosa that may cause burning pain. Patients with infectious conditions report increased burning sensation on consuming food which is contrary to patients report in true BMS, where in reduction in pain intensity is reported on eating. This finding would therefore be necessary to rule out fungal infection being the cause of burning pain. Bacterial infections such as spirochetes, fusiform, Enterobacter and klesbsiella species and helicobacter pyroli have been suggested as causative factors of BMS [18-22].

Erythema migrans (Geographic tongue), lichen planus

Atrophic and ulcerative forms of lichen planus are known to cause burning pain especially during periods of exacerbation [23]. Other mucosal conditions such as benign migratory glossitis, hairy tongue and fissured tongue have also been proposed as the cause of BMS [24,25]. Benign migratory glossitis is otherwise painless, but burning sensation may occur in areas of depopulation which is exacerbated on consuming spicy food, alcohol and stress, Fissured tongue is also painless unless the grooves and fissures are inflamed or infected due to accumulation of debris resulting in burning sensation [26,27]. The differential diagnosis of these mucosal conditions is made on the basis of visual inspection, true BMS cases show normal mucosa [24-27].

Clenching habit

Parafunctional habits such as clenching, bruxism, lip trapping, sucking, licking, mouth breathing have been proposed as causative factors in BMS [29-31].

Galvanism

Presence of dissimilar metals that cause electrochemical potential differences may cause burning sensation, this as a cause of BMS is rare however has shown evidence in literature and therefore must be considered during the diagnosis [22].

Allergic reactions

Allergic reactions to polymethylmethacrylate, epoxy curing agent, chromium, cobalt, nickel, cadmium, amalgam (mercury), gold, potassium, palladium and related materials in dental prod-

ucts and food-related products such as sorbic acid, propylene glycol, fragrance mix (eugenol, cinnamic aldehyde), benzoic acid, mint and cinnamon may cause allergic contact stomatitis (type IV hypersensitivity reaction) but are rare implicated in BMS as, once again, there is a lack of clinical oral mucosa irritation in BMS patients. In cases that are confirmed by patch testing, cessation of exposure to these materials may result in improvement of burning symptoms [28,32-38].

III-fitting prosthesis

Poorly designed dentures that causes compromised tongue space or lingually placed occlusion, or incorrect vertical dimension may benefit some patients [39,40]. This characteristic is especially debatable as there have also been case control studies that prove that mechanical factors such as occlusion, articulation and denture stability are unlikely to cause BMS [41].

Systemic causes of oral burning

Oral burning may indeed be an indication towards an undiagnosed underlying systemic condition. Therefore for the diagnosis, the possible systemic cause should be ruled out.

Blood disorders associated with anaemia, folate, iron deficiencies are associated with oral dryness, tongue papillary changes and burning pain. Zinc deficiencies have also been associated with burning oral mucosa [42,43].

Autoimmune and connective tissue disorders such as Sjogren's syndrome, sicca and SLE are associated with oral dryness and increased risk for candida which further causes oral burning. A wide proportion of people may display immunological features such as elevated rheumatoid factor and anti-nuclear antibody, however no evidence of consistent relationship between BMS and connective tissue disorder has been found questioning the association [44,45].

GERD must be ruled out in patients complaining of oral burning, this can be addressed with careful history taking and examination.

Endocrine disorders such as uncontrolled diabetes and thyroid disorders along with hormonal deficiencies and alterations at menopause have been associated with oral burning [22,48-55].

Medications such as TCA's, ACE inhibitors such as captopril, enalapril and lisinopril have been associated with oral burning pain [57-59].

CNS changes such as multiple sclerosis, Parkinson's, and TGN may be associated with oral neuropathic pain mimicking BMS. Prevalence of BMS has been higher in patients with Parkinson's

than in general population suggesting the role of dopaminergic pathways [60].

Facial pains and pains in other parts of body have been reported in BMS patients. BMs has also been linked with a group of idiopathic focal conditions with a predilection for oro-cervical and urogenital regions such as vulvodynia [39,61-63].

Psychogenic factors

Disorders such as depression, anxiety and somatization have been associated with BMS, and atleast one-third of BMS patients may have an underlying psychological diagnosis [24,64,65].

Cancerophobia - 20% patients have been reported with phobic concerns and is often manifested as repeated self-examination by the patient [28].

High levels of psychological disturbances involving depression, anxiety, somatization and personality disorders are not usually associated with BMS patients, however these are common findings in the chronic pain population and may contribute to the cause, intensity or urgency of complaint or may be the result of the constant pain [66,67].

BMS subjects have shown elevations in the following personality characteristics: concerned with bodily function, depressed, emotionally repressed, angry, distrustful, anxious and socially isolated as compared to age and gender matched control subjects [56]. these characteristics are similar to those seen in other chronic pain patients, and these personality disturbances tended to aggravate with increased pain. It appears personality characteristics among chronic pain patients, be it BMS or other pain conditions, share a certain commonality. As also, many of the medications used to treat these psychological conditions and personality disorders can cause side effects such as dry mouth and taste alterations that may induce or exacerbate oral burning symptoms. Therefore, the question remains whether psychological disturbances and personality disorders are aetiologically related to BMS or if chronic oral burning sensations initiate or exacerbate psychosocial disorders - "chicken and egg" dilemma. Regardless, the presence of these co-morbidities certainly suggests treatment of these problems is necessary, although this does not constitute evidence of causality.

Summary

Burning in the mouth can be a symptom and is not always a Burning Mouth Syndrome. The condition must be essentially distinguished as the treatment protocols are completely different and if not diagnosed can cause harm to the patient. The current review presents with various conditions that cause burning sensation in the oral cavity and can serve as a guideline for differential diagnosis of Burning Mouth Syndrome.

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