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REVIEW ARTICLE

Burning Mouth Syndrome

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Abstract

Despite its high prevalence burning mouth syndrome remains an enigma for dental profes- sionals due to lack of definite diagnostic criteria and management protocols; which is the reason for probable understated incidence. This article layouts the understanding of etiol- ogy, pathogenesis and further reviews the proposed diagnostic criterions, management pro- tocols and differential diagnosis of Burning Mouth Syndrome. (2020, Vol. 04; Issue 01: Page 1 - 6)

Keywords: Burning mouth syndrome, Glossopharyngeal neuralgia, Trigeminal neuralgia, Plicate tongue.

Introduction

Burning in the oral cavity is an enigma and association of pain with burning sen- sation is a cause of pain and disability that impairs the quality of human life, and thus identifying and addressing the condi- tion is importunate for oral health profes- sionals. According to International Associ- ation for the study of Pain, this condition is defined as, “burning pain in the tongue or other oral mucous membrane associ- ated with normal signs and laboratory findings lasting at least 4-6 months” (1, 2). According to Zakrzewka et al, the com- plaint of a burning sensation in the mouth which can be localized to the lips or tongue or be more widespread within the mouth can be said to be asymptomatic of other disease or a syndrome in its own right of unknown aetiology (3).

Burning mouth is said to be symptom of other disease when local or systemic fac- tors are associated, however if no underly- ing medical or dental cause is identifies; the condition is called as ‘Burning Mouth Syndrome’; patients experience subjective xerostomia (dryness), oral paraesthesia and altered taste or smell. Hence it has also been called as scalded mouth syn- drome, stomatodynia, sore tongue, burn- ing lips syndrome, glossodynia, glossalgia, stomatopyrosis, oral dysesthesia, burning mouth condition, glossopyrosis, sore mouth (4).

Epidemiology

Due to the lack of appropriate and con- sistent classification system, definitive di- agnostic criteria and their awareness among the oral health care professionals, it has been hard to determine the preva- lence rate of BMS in general population. Reported prevalence rates in general pop- ulations vary from 15% to 0.7% and relate to burning mouth as a symptom (5, 6). BMS predominantly affects females with an increased prevalence with age and fol- lowing menopause (7). BMS is basically a disorder of middle-aged and elderly indi- viduals with an age range of 38-78 years.

BMS exhibits significant female predilec- tion and the ratio between females and males varies from 3:1 to 16:1 in various literature studies (3).

Etiology

1. Dental -- Incorrect use of orthodon- tic appliances, tongue piercing, poorly po- sitioned dental prosthesis, in long-term use without revision or in a state of corro- sion, leaving a metallic taste in the mouth leading to leads to the appearance of ery- thema and a burning sensation. If and when these factors are ruled out, TMJ de- rangements should be considered as prob- able cause.
2. Allergens -- Dyes, preservatives and food additives was found in 65% of pa- tients with burning mouth syndrome characterized by intermittent pain, with pain-free intervals, which occurs in unu- sual places. Cinnamon aldehyde, ascorbic acid, tartarazine, benzoic acid, propylene glycol and menthol, foods such as shrimp, nuts, fish and chocolate can cause a sud- den onset allergy, with swelling and itch- ing usually occurring on the tongue, med- ications such as sulfa, antibiotics, non- hormonal anti- inflammatory drugs and pain relievers.
3. Candida -- Sometimes infections such as candida give symptoms of burning sensation in the mouth, which leads to dysphagia and sialorrhea. The pain and burning sensation is due to increasing col- onization of candida and is frequently as- sociated with prosthesis.
4. Alteration of the salivary gland function -- The function of the salivary glands is altered by drugs such as anti- cholinergics, antihistamines, antiretrovi- rals, tricyclic antidepressants, serotonin reuptake inhibitors and omeprazole that induce xerostomia, which further affects food, the ability to resist bacterial coloni- zation of the teeth and changes the taste for food. Burning can develop from days to years after exposure to the causative agent. Function of salivary glands is also altered during chemotherapy and radio- therapy. Chemotherapeutics, such as, Adriamycin, lead to mucositis after 5 to 7 days of drug administration. Radiotherapy (RT) initially leads to mucositis and hyper- salivation by local inflammation. During this period the mucosa is extremely pain- ful. If radiotherapy is maintained, perma- nent mucosal atrophy may occur, giving the tongue a burning sensation, dry mouth and difficulty swallowing. The function of the salivary glands is compro- mised depending on the irradiation dose and above 40Gy / irradiation dose there is already irreversible gland damage.
5. Medicines -- Medications such as ACE inhibitors, Antiretrovirals, antibiotics (cephalosporins, chloramphenicol, peni- cillin, gabapentin), tricyclic antidepres- sants and anxiolytics are also cited as causing oral pain
6. Connective tissue diseases -- Sjögren's syndrome is an autoimmune disease, affecting more women between 40 and 60 years of age, and may be associ- ated with other connective tissue disor- ders, such as multiple sclerosis and rheu- matoid arthritis. The classic manifesta- tions of this syndrome are keratoconjunc- tivitis, xerostomia and changes in connec- tive tissue.
7. Fibromyalgia (FM) is a chronic pain syndrome, diagnosed based on the pres- ence of pain in at least 11 of the 18 tender points lasting at least 3 months. 32.8% of FM patients have BMS and the most com- mon oral manifestations with fibromyalgia include: dry mouth (70.9%), orofacial pain (32.8%), TMJ dysfunction (67.6%), dys-
phagia (37.3%), dysgeusia (34.2%).
8. Endocrinal – Endocrine SBA can be a sign of undiagnosed Diabetes Mellitus (DM), therefore, it is necessary to empha- size the importance of DM research, espe- cially in patients over 50 years, a time when the incidence of type II DM in- creases.

The prevalence of BMS is greater among females, and particularly in middle-aged and elderly women. The age-related reduc- tion in estrogen and progesterone levels favors dryness of the mucosal mem- branes, and psychological disturbances

are more frequent in middle-aged and el- derly women. Based on the existing evi- dence, menopause can be associated to an increased risk of developing BMS. This hy- pothesis in turn is supported by the good results obtained with oral hormone (estro- gen) replacement therapy in application to the symptoms of xerostomia.

9. Nutritional Deficiencies - Among patients with B vitamin deficiency, 40% may have a tongue burn. Pain occurs on the tongue, especially on the tip, and atro- phy of the papillae. Hemodialysis patients, who perform some type of food restriction (vegetarians, lactose-free diet), alcoholics and the elderly, are the ones that most present this vitamin deficiency. Zinc defi- ciency can cause organic changes such as atrophy of the lingual papillae, which leads to dysgeusia and glossodynia. An improvement in oral symptoms occurs af- ter zinc administration, and an even greater improvement occurs when zinc is associated with vitamin B12 and iron (8).

10. Psychological disorders - Depres- sion and anxiety modulate the pain per- ception, reducing the pain threshold and thus causing normal stimuli to be per- ceived as painful. Certain psychological problems share common symptoms with BMS such as unpleasant sensations, chronic pain, and the absence of any clear organic disorder capable of accounting for the patient symptoms. In addition, im- provements in BMS have been observed as a result of cognitive-behavioral therapy and the use of anxiolytic drugs. However, some authors suggest that these psycho- logical disorders are more a consequence of BMS than a cause of the syndrome (9).

Pathogenesis

When associated with depressive and anx- iety disorders, there are changes in the pain threshold (9) and pain perception an evidence of the same is provided in studies done to test CBC against placebo (10).

As also burning mouth syndrome is asso- ciated with sensory alterations such as, increased or decreased heat tolerance, al- tered taste sensation, increased excitabil- ity of blink reflex; this increased excitabil- ity of blink reflex is an evidence for the fact that changes are occurring both at central and peripheral levels.

The burning nature of pain is an evidence of the fact that the pain in neuropathic in nature; supporting the same are immuno- histochemistry test that have shown change in small and large peripheral nerve fibres, especially C-fibres.

As also, endogenous dopamaine levels have been found to be decreased in puta- mane levels of individuals. This could be due to diminished pre- synaptic dopinergic inhibition, causing increased release of dopamaine into the intra-neuronal space causing increased neuronal excitability. (9)

Clinical signs and symptoms

The prominent feature is the symptom of burning pain which can be localized just to the tongue and/or lips but can be more widespread and involve the whole of the oral cavity. In most patients the symptoms are bilateral. Sometimes words such as 'discomfort', 'tender' and 'annoying' in- stead of burning are used. In most cases the symptoms have been continued for many months and the intensity of pain tends to increase towards the end of the day. Altered taste sensation and dryness are frequently reported. Many of these pa- tients show evidence of anxiety, depres- sion and personality disorders and it has been demonstrated that patients with burning mouth syndrome show an in- creased tendency for somatization as well as several other psychiatric features when measured on the SCL -90 questionnaire (11)

Anatomic variations related to the BMS

Plicate tongue—

In some people, after the age of four, the tongue grooves, with folds may appear in the anterior two thirds of the tongue. Burning sensation may occur when there is inflammation in these grooves, caused

by the ingestion of acidic and / or highly seasoned foods. These grooves are the gateway to infections such as herpes sim- plex, candida and syphilis. It can be part of the Melkerson Rosenthal Syndrome that is associated with granulomatous glossitis, facial paralysis, plicated tongue and edema of the lips. It is present in 30% of patients with Down syndrome.

Geographic tongue—

Geographic tongue is characterized by ar- eas of pink mucosa with a grayish center. These areas come together and are inter- spersed with normal mucosa, being a con- stitutional anomaly and not a disease. Pa- tients with this tongue disorder may have more cancerophobia. It is believed that in order for this anomaly to appear, not only genetic factors are involved, but also psy- chological (stress) and local (allergic reac- tions) factors. There is usually an increase in the areas of abnormal mucosa during a fall in general condition. These areas of anomalous mucosa are more sensitive to very salty, spicy or sour foods, and pain in the mouth may occur (8).

Diagnostic methods

Scala et al. proposed series of differential diagnostic criteria for identifying BMS (1).

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—

6. Dysgeusia and/or xerostomia
7. Sensory or chemosensory altera- tions
8. Mood changes or psychopathologi- cal alterations

Lamey et al. divided the syndrome into three types (8):

1. Type 1 (35%), characterized by daily pain with no pain in the morning, but that worsens throughout the day, without as- sociation with psychiatric changes.
2. Type 2 (55%), constant pain, since waking up, these patients have a high de- gree of anxiety.
3. Type 3 (10%), intermittent pain, with pain-free intervals, which occurs in unusual places such as the floor of the mouth and posterior wall of the orophar- ynx, with a relationship between pain and the type of food ingested and allergens. Sensations of dry lips and mouth or in- tense salivation are well-known symp- toms. Changes in the salivary composition of these patients were detected with an in- crease in the amount of potassium, pro- teins and phosphates, which makes saliva thicker and stickier. Another important symptom is hypogeusia and dysgeusia, in which patients report persistent taste, mainly metallic, salty or bitter.

Treatment

History	Character of pain
	Duration
	Intensity
	Location
	Aggravating / alleviating factors
	Salivation
	Change in taste
	Habits – Alcohol chewing gum
	Dental appliance
	Psychological evaluation
Intra-Oral	Erythema
	Glossitis
	Atrophy of lingual papillae
	Tongue demarcated by teeth
	Plicated tongue
	Geographic tongue
	Lichen Planus
	Xerostomia
Investigations	CBC
	TSH, Free T4
	Blood Sugar, Glycated Hb
	Iron, Ferritin, Transferrin, Folic Acid.
	Rheumatoid factor – if suspected
	Candida culture – if present
	Patch test- if food allergies suspected
	Salivary evaluation – if necessary

Differential Diagnosis

Trigeminal neuralgia - Trigeminal neural- gia is characterized by brief bouts of pain, of severe intensity, in cluster, generally af- fecting people over 50 years old, mainly the mandibular branch territory, which can lead to hypo or paresthesia of the tongue. It can be caused by nerve com- pression due to neoplasia, vascular mal- formation, encephalopathy, myringomye- lia, herpes zoster infection, trauma or after tooth extraction.

Glossopharyngeal neuralgia - Glossopha- ryngeal neuralgia is a rare entity, with more women between 40 and 60 years of age. Pain is usually disabling, unilateral, affecting the posterior oropharyngeal wall, tonsillar fossa and base of the tongue, ra- diating to the ear. It is triggered by swal- lowing, coughing or phonation.

The pain can be caused by neoplasms not yet diagnosed, infection, elongated styloid process and vascular causes such as: compression, stretching or looping of ar- teries, mainly of the postero-inferior cere- bellar artery. Neuralgia can develop with bradycardia, asystole and syncope in up to 10% of cases (8, 12).

There is no clear-cut distinguishes be- tween Burning Mouth syndrome, Oral Submucous Fibrosis and oral lichen planus. Beetle nut chewing, tobacco smoking are known common associated factors. They have distinct symptomatol- ogy and histological findings; however the clinical features, suspected etiologies and treatment modalities are similar.

Paucibacillary inderminate leprosy – It is a form of leprosy, which affects cranial nerves and produces various symptomol- ogy such as anosmia, ulceration, loss of taste sensation, loss of tactile sensation of face, tongue, pharynx; Facial palsy, cor- neal opacity, nerve deafness or conductive

deafness of Eustachian origin may occur. All of these symptoms are caused due to the effect of the virus affecting the trigem- inal, glossopharyngeal and vagus. Symp- toms resolve within a month after treat- ment with anti-leprosy drugs (13).

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