Brief Perspective on Burning Mouth Syndrome: A Review

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Burning mouth syndrome (BMS) also called as stomatopyrosis, is an enigmatic disorder causing chronic pain of the intraoral soft tissues. It is a distinctive nosological entity including all forms of burning sensation in the mouth and described as stinging sensation or pain in association with oral mucosa that appears clinically normal in the absence of local or systemic diseases or alterations. The etiology of BMS is not known although a number of factors have been suggested. These include hormonal changes associated with menopause, allergic reactions, chronic low-grade trauma, genetic polymorphisms, psychosocial and personality disorders namely alexithymic traits, cancer phobia somatisation, obsession-compulsion disorders, etc. Among the proposed causative factors, psychological disorders have been frequently associated. These findings suggest a need for an interdisciplinary treatment which apart from dental therapy demands a certain kind of psychotherapy. A number of treatment modalities have been used, but they are found to be variable, unpredictable and outcome is often discouraging. Nevertheless, newer forms of therapy are being described in the literature. This presentation will highlight the various strategies employed in diagnosis and newer modalities of the treatment for such patients.

Keywords: Burning mouth syndrome, Diagnosis, Etiology, Polymorphisms, Psychotherapy

INTRODUCTION

Burning mouth syndrome (BMS) is a chronic orofacial pain disorder.\(^1\) It is an idiopathic condition characterised by the presence of burning sensation of the oral mucosa without any visible mucosal changes and with no laboratory abnormalities.\(^2\) The International Association for the Study of Pain and International Headache Society defines it as a “distinctive nosological entity, including 'all forms of burning sensation in the mouth with stinging sensation or pain, in association with an oral mucosa that appears clinically normal in the absence of local or systemic diseases or alterations.'”\(^3\) It occurs more commonly in middle-aged and elderly women and often affects the lateral borders and tip of the tongue, lips, hard and soft palate.\(^4\) The pain is typically described as burning. The burning sensation is persistent and unremitting without aggravating/relieving factors. The symptoms often last for months or years, and the intensity of the pain varies from slight to very severe. The term BMS should be used in patients where there are no oral signs, and no underlying dental or medical causes.\(^5\)

EPIDEMIOLOGY

BMS has a typical predisposition to gender. The occurrence of BMS is a more common in women who are around 2.5-7 times more than men. Around 90% of female patients with BMS are perimenopausal women with typical onset from 3 to 12 years post the beginning of menopause.\(^6-8\) Patients with BMS have a wide age range from 27 to 87 years, however, patients are found in the older age group. It has been reported that the mean age of occurrence of BMS is 61 years. Patients with BMS have an increased likelihood of gastrointestinal and urogenital disease, with estimated odds ratio of 3.5 and 2.9, respectively, compared to control subjects.\(^9\)

ETIOLOGY

There are varied etiological factors that result in BMS.\(^10\) It has been proposed that there is an interaction between the biologic and psychogenic factors, and hence making the etiology of BMS multifactorial.\(^11\) Some of the etiological factors resulting in BMS are neuropsychiatric, endocrine, infectious, immunologic, nutritional, and iatrogenic causes.

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A few psychiatric abnormalities such as depression, anxiety, personality disorders, and hypochondria have been reported in BMS patients. However, a few researchers consider BMS a concurrent or secondary factor.12

BMS most commonly affects perimenopausal women. This occurs due to the age-related reduction in estrogen and progesterone levels. A fall in neuroprotective gonadal and adrenal steroids during menopause may also lead to a concomitant decrease in neuroactive steroids, leading to degeneration of oral mucosal small nerve fibers and brain areas involved in oral somatic sensations.

Allergic reactions to antigens that include sorbic acid, cinnamon, nicotinic acid, propylene glycol, benzoic acid, zinc, cobalt, mercury, gold, palladium, sodium lauryl sulfate, etc., have also been demonstrated in the BMS patients.9

Autoimmune connective tissue disorders, such as Sjogren’s syndrome and systemic lupus erythematosus, are also associated with BMS.

The BMS has also been associated with some of the drugs which include angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers, nevirapine, efavirenz, levodopa, topiramate, etc. ACE inhibitors and angiotensin receptor blockers may trigger the development of BMS, possibly due to increased levels of kallikrein in the saliva of BMS patients leading to increased inflammation in the oral cavity.

A significant difference in thermal and nociception thresholds of patients with BMS were observed as compared with control subjects. Thus, a neuropathic mechanism for BMS is favored. However, controversy remains over whether a peripheral or central dysfunction is responsible for BMS.

Nutritional deficiencies which include deficiency of vitamins B1, B2, B6, B12 as well as folic acid have also led to the development of BMS. Diabetes is also one of the major factors responsible for the BMS.9

**CLASSIFICATION**

- Based on etiology
  - Idiopathic
  - Secondary.
- Based on diurnal fluctuations of symptoms
  - Type 1 BMS (35%) are usually symptom-free during early morning hours which worsen as the day progresses and variable symptoms at night (Nutritional deficiencies and diabetes)
  - Type 2 BMS (55%) is defined by continuous symptoms in the day but none at night (Chronic anxiety)
  - Type 3 BMS (10%) symptoms at irregular intervals scattered with symptom-free days (Dietary or prosthetic allergies).9

**CLINICAL DIAGNOSIS**

The diagnosis of BMS remains challenging as diagnostic criteria are not sufficiently defined or universally accepted, several confounding diagnoses exist, and the clinical picture is often variable.

Scala et al., proposed the following fundamental criteria:
1. Daily and extreme bilateral burning sensation of the oral mucosa
2. Burning sensation for at least 4-6 months
3. Constant or increasing intensity during the day
4. Possible improvement on eating or drinking with no aggravation; and
5. No interference with sleep.
Additional supportive criteria are:
1. Dysgeusia and xerostomia
2. Sensory alterations
3. Chemosensory alterations; and
4. Mood changes or psychopathological alterations.

For the evaluation of BMS, a careful review of recent mood disturbances, dietary habits, history of dental procedures, and use of dental prosthesis, nutritional deficiencies, and changes in medication is required. Physical examination includes a detailed study of the oral cavity and dental inspection. Laboratory analysis for specific allergies must include hematological assessment of nutritional deficiencies, blood glucose levels, autoimmune markers, estrogen and progesterone concentrations, and patch testing. Measurement of salivary flow rates should be employed.

It has shown that BMS patients process thermal and pain stimulation in the brain differently than pain-free individuals as demonstrated by functional magnetic resonance imaging of the thalamus.

Other investigations may include oral cultures and scrapings to evaluate for a bacterial or fungal origin of symptoms.\(^9\)

**TREATMENT**

The initial management of BMS should be directed at elimination of any causative local or systemic disease as well as withdrawing offending medications (such as ACE inhibitors). Investigated strategies include antidepressants, anxiolytics (benzodiazepines), topical capsaicin, alpha lipoic acid, hormone replacement therapy, anticonvulsants, biofeedback technique to modify parafunctional habits, and psychosocial treatment modalities.\(^13\) Psychiatric interventions have shown great promise in treating patients with BMS. Psychogenic factors have recently gained a lot of attention as the cause of stomatopyrosis, necessitating the use of psycho-pharmacotherapy and psychotherapy.\(^15\) Antidepressants such as paroxetine, sertraline, amisulpride that belong to the group of psychotropic or psychoactive drugs are increasingly been used.\(^15\) Psychotropic drugs change the neurochemical transmission system that synapses with axon terminals of a neuron transmits stimuli to the dendrites of the neighboring neuron through the synaptic cleft.

Anxiolytics affects the central nervous system. They have a substantial impact on the reticular activating system of the brain, limbic system, hypothalamus and systems of gratitude and punishment.\(^15\) Clonazepam belongs to benzodiazipine group used either topically or systemically. It appears to have an excellent efficacy in the relief of the symptoms related to BMS. Partial or lack of response has been observed in some BMS patients taking these medications. In such cases, gamma-aminobutyric acid receptor-acting anticonvulsants (gabapentin, baclofen) have been used in combination with clonazepam. The potency of topical administration of clonazepam in the management of BMS highlights a possible role of both peripheral tissue changes and cell membrane instability in the etiology of BMS.\(^16\)

Autogenous training is considered to be the queen of psychotherapy. It is based on the patient’s “opening up” and intensive “discharging” of his feelings. This form of training is easier and a more efficient which enables normal functioning. Cognitive behavioral therapy for the duration of 1 h for every week lasting for 12-15 weeks significantly reduces BMS symptoms. A statistically significant difference in reduction in pain intensity for those receiving cognitive behavioral therapy compared to placebo was shown immediately following the treatment and at 6 months follow-up.

Alpha-lipoic acid is an essential cofactor for many enzyme complexes that regulate various cellular reactions. It is imperative for aerobic life and is a common dietary supplement. Lipoic acid is an effective antioxidant when taken in excess as a supplement and it has been found to prevent the symptoms of Vitamin C and vitamin E deficiency. Lipoic acid is effective in treating neuronal damage which is also one of the causative factors for BMS. It has been found to alleviate symptoms of BMS.\(^17\)

Several studies have shown that capsaicin acts as a desensitizer for receptors of neurogenic inflammation. Hence, local capsaicin rinse may be beneficial in treating BMS. Improvement of symptoms in over 75% of the patients after eight wk of therapy without significant side effects has been observed. Capsaicin can also be given systemically and it has shown a dramatic improvement in patients (93%) with severe BMS (VAS scale 8-10 at 1 month), who have consumed capsaicin (0.25%) capsules 3 times a day.

A possible relationship has postulated between estrogen hormone imbalances (seen in menopause) and the onset of the sensory alterations characterizing BMS. Hormone replacement therapy can alleviate oral symptoms and improve oral cytological features.\(^18\)

Analgesics, mouth rinses have also been tried for the treatment, but it is of less significance. Lidocaine is a local anesthetic agent, and 0.15% benzylamine hydrochlorate has anesthetic and anti-inflammatory effect. However, these agents can reduce the pain and burning sensation, but the analgesic effect is of short duration.\(^5\) Topical application of *Aloe vera* has also been found to produce good response.\(^5\)
The variable response rate to medical therapy is likely due to the multifactorial pathophysiology of idiopathic BMS, including irreversible processes.

**CONCLUSION**

BMS is a chronic, complex, intraoral pain disorder with varied etiology. BMS remains a fascinating, though poorly understood, condition in the field of oral medicine. The key for successful management is based on identifying the causative factors, elimination of these factors and if the pain persists multidisciplinary approach should be instituted.

**REFERENCES**


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