Episode 106 – Burning Mouth Syndrome April 12, 2024

Overview

Burning mouth syndrome (BMS), also referred to as stomatypyrosis, glossopyrosis, stomatodynia, glossodynia, sore mouth, sore tongue, burning tongue, or oral dysesthesia, is a complex chronic pain disorder. [1] [2]

BMS is characterized by generalized or localized persistent burning sensation in clinically normal oral mucosa and without a detectable cause. However, stress, anxiety, depression, and personality disorders may play a critical role in this condition.

Burning sensations usually present bilaterally and with fluctuating intensity. The tip and anterior two-thirds of the tongue are most commonly involved. Other areas often involved include the lips, palate, gingiva, and lateral borders of the tongue. BMS negatively impacts quality of life, occurs more often in females, especially those who have experienced menopause, and is rarely diagnosed in females younger than 30 years. Etiology remains unknown. However, both physiological and psychological factors may play a role in causing, perpetuating, and exacerbating BMS. Clinical management is complex and there is no standard treatment protocol, but both physiological and psychological components of the symptoms should be addressed. [3] [4] [5] [6] [7] [8]

Prevalence

Prevalence of BMS ranges from 0.7 to 5%, with a female to male ratio of seven to one. Prevalence increases with age in both females and males, with the highest prevalence reported in postmenopausal females aged 60-69 years. [9]

Some studies have reported complete or partial remission (with or without intervention) in approximately 50% of people, with complete spontaneous remission in about 20% within six to seven years of symptom onset. Symptom remission, whether partial or complete, is often characterized by a change in the pattern of pain from a constant to sporadic nature. However, reports of complete spontaneous remission within five years after BMS onset was limited to 3% of individuals. [10]

COVID-19 and BMS

Candela et al. (2022) investigated the impact of the COVID-19 pandemic on individuals with BMS. The researchers found the pandemic worsened anxiety, sleep quality, and pain intensity among individuals with BMS. [11]

Ottaviani et al. (2024) found during the COVID-19 pandemic, individuals with BMS experienced heightened stress, anxiety, depression, post-traumatic stress, and also reduced post-traumatic growth. Post-traumatic growth is the positive psychological change experienced after enduring trauma or a highly challenging situation. This growth can include a new appreciation for life or a newfound strength. The study highlights the need to prioritize the psychological well-being of people with BMS, focusing on stress management and fostering post-traumatic growth in challenging times. [12]

A systematic review by Williams and Zis (2023) investigated the prevalence, determinants, and clinical presentation of COVID-19-related BMS. Findings included:

- COVID-19-related BMS occurred in 4% of mild-to-moderate cases of COVID-19 and were more frequent (15%) in severe cases in the acute phase of infection. COVID-19-related BMS incidence appeared to increase over COVID-19 disease duration.
- Clinical presentation of COVID-19-related BMS included xerostomia (44%), impaired taste (25%), swallowing difficulties (16%), and burning sensation (15%), with one study noting only female participants experienced the burning sensation.
- Of these reported symptoms, burning sensation (15%), xerostomia (11%), and impaired taste (11%) were the most frequently reported symptoms post recovery.

The authors concluded COVID-19-related BMS could potentially be initial long COVID[1] manifestations, and further research is required. [13]

Classifications

Two BMS classifications have been proposed based on symptom fluctuations or etiology.

Classification based on daily symptom fluctuations [7] [10] [14]

Type	Clinical characteristics	Prevalence among people with BMS	Associated conditions
Type 1	Pain typically absent upon waking, increases throughout the day, worse in the evenings	35%	Systemic conditions (e.g., nutritional deficiencies, diabetes)
Type 2	Daily pain, lasts all day, affects falling asleep	55%	Psychological disorders (e.g., anxiety)
Type 3	Intermittent pain with atypical location (e.g., floor of mouth, throat, buccal mucosa)	10%	Oral allergens

Etiology

The second classification, based on symptom etiology, is organized into two clinical forms, primary and secondary. BMS is defined as primary or idiopathic when causes cannot be identified. Secondary BMS results from local or systemic conditions. [15]

Primary BMS

Although the exact mechanisms involved in the pathophysiology of primary BMS are still unknown, there is evidence that BMS may be a neuropathic condition, affecting the

[1] Refer to Episodes 28, 38, 48, 59, 71, 93, and 97 for additional information on long COVID.

central and peripheral nervous systems. Studies have also suggested psychological factors, with anxiety and depression being the most common comorbid disorders among those with BMS. [10] [15] [16]

Secondary BMS

Secondary BMS can be caused by local or systemic conditions. These conditions must be excluded in the diagnosis of primary BMS. Causes of secondary BMS may include:

- Oral infections (bacterial, viral, fungal, such as candidiasis which is the most common oral disease that can present with burning pain)
- Oral mucosal disorders (e.g., recurrent aphthous stomatitis, lichen planus,[2] mucous membrane pemphigoid,[3] pemphigus vulgaris,[4] benign migratory glossitis [geographic tongue], neoplasia)
- Xerostomia (dry mouth)[5] or reduced salivary flow (e.g., from medications,[6] cancer therapy,[7] mouth breathing, dehydration, etc.)
- Oral parafunctional behaviour (e.g., tongue thrusting; habitually rubbing the tongue over teeth or a prosthesis; clenching; bruxism; lip, cheek, or tongue biting)
- Irritative factors (e.g., poorly fitting dentures, intraoral galvanism)
- Nutritional deficiency (e.g., vitamin B12 [cobalamin], B9 [folate], B6 [pyridoxine], B2 [riboflavin], B1 [thiamin]; vitamin C, iron, zinc)
- Anemia
- Diabetes[8]
- Thyroid dysfunction (e.g., hypothyroidism)
- Sjögren syndrome[9]
- Allergies (e.g., foods; food flavourings, additives, fragrances, or dyes; dental materials, oral care products)
- Certain medications are associated with BMS (e.g., antihistamines, antipsychotics, antiarrhythmics, benzodiazepines, some antihypertensives, such as angiotensin-converting enzyme [ACE] inhibitors)
- Gastroesophageal reflux disease (GERD)
- Eating disorders (burning tongue is a common finding in eating disorders)[10]
- Oral health habits (e.g., brushing or scraping tongue too hard or too often, overusing mouthrinses)[11] [2] [7] [10] [14] [15] [17] [18] [19]

[2] Refer to Episode 75 for additional information on lichen planus. Lichen planus was also discussed in Episodes 62, 76, and 94.
[3] Refer to Episode 62 for additional information on mucous membrane pemphigoid.
[4] Refer to Episodes 30, 62 for additional information on pemphigus.
[5] Refer to Episodes 55 and 62 for information on xerostomia.
[6] Refer to Episode 62 for information on drug-induced xerostomia.
[7] Refer to Episodes 68, 78, and 92 for information on cancer therapy and oral health.
[8] Refer to Episodes 91, 93, and 94 for detailed discussion on diabetes and Episode 54 for information on diabetes and COVID-19.
[9] Refer to Episode 62 for information on Sjögren syndrome.
[10] Refer to Episodes 95 and 96 for additional information on eating disorders.
[11] Refer to Episode 103 for discussion on mouthrinses.

Risk factors

BMS is relatively uncommon and usually starts suddenly for no known reason. However, certain factors may increase risk of developing BMS, including:

- Female sex
- Perimenopause or postmenopausal
- Over the age of 50
- Smoking
- Recent illness
- Certain long-term medical conditions, such as fibromyalgia, Parkinson's disease, autoimmune disorders, and neuropathy.
- Previous dental work
- Allergic reactions to food
- Certain medications
- Traumatic life events
- Stress
- Anxiety
- Depression[12] [15] [20]

Complications

BMS has a lengthy disease course with an average of six to seven years and is associated with poor health-related quality of life (HRQL) and poor oral health-related quality of life (OHRQL), affecting a person's well-being. [21] [22]

Complications of BMS are mainly related to discomfort, such as problems falling asleep or difficulty eating. Long-term BMS involving excessive discomfort may lead to anxiety or depression. [20]

Also, a lack of available definitive treatment options can lead to a frustrating cycle of referrals between dentists, oral pathologists, gastroenterologists, neurologists, family physicians, and otolaryngologists, often to no avail. [9]

Symptoms

BMS is associated with burning or stinging pain on the tongue, lips, palate, and other oral mucosa. The pain may also be described as tingling, itching, prickling, or numbness, and symptoms can vary from person to person. The location of the pain does not seem to affect the course of the disease or the response to treatment. Accompanying symptoms may include dry mouth, dysgeusia (altered taste e.g., sour, bitter, metallic taste), ageusia (loss of taste), and oral paresthesia. [9] [10] [20] [21]

In more than half of people with BMS, symptoms appear spontaneously with no identifiable triggering factors. Approximately 17-33% of people attribute symptom initiation to a previous condition, such as upper respiratory infection, dental procedure, or medication use. Others relate the appearance of symptoms directly with stress. [10]

[12] Refer to Episode 88 for additional information on mental health and oral health.

BMS may last for months to years. In rare cases, symptoms may suddenly resolve on their own or occur less often. Sometimes the burning feeling may be briefly relieved during eating or drinking. [20]

As previously mentioned, BMS discomfort can occur in different patterns. It may:
- Occur every day, with little discomfort upon wakening, but become worse as the day goes on.
- Begin upon wakening and last all day.
- Occur intermittently. [20]

Diagnosis
Recent diagnostic criteria for BMS includes intraoral burning sensation that recurs daily for more than two hours for more than three months, without clinically evident causative lesions, and no local or systemic causes identified after clinical examination or investigation. BMS diagnosis is made only after ruling out other causes of burning sensation. [23] [24]

Diagnosing BMS requires an interdisciplinary approach to examine the following:
- Local factors (e.g., parafunctional habits, salivary changes),
- Systemic factors (e.g., diabetes, nutritional deficiencies), and
- Psychological factors.

In oral healthcare, to aid in diagnosing BMS, the following areas can be assessed:
- Medical, dental, and psychological history (e.g., anxiety, depression, personality disorder)
- Medication use, with special attention to those that can produce xerostomia.
- Pain characteristics, such as onset, duration, location, and timing, if accompanied by xerostomia and taste alteration, if alleviated or aggravated by foods or beverages, and any precipitating factors.
- Quantify the pain, for example by using a visual analogue scale (VAS).[13]
- Parafunctional habits
- Oral self-care routine[14]
- Intraoral and extraoral examination to detect causative conditions, such as erythema, erosions, depapillated tongue, etc.
- Dental problems (e.g., reviewing prostheses and their occlusion, any probable oral galvanism)
- Salivary gland function (e.g., volumetric tests of unstimulated and stimulated saliva flow)
- Oral culture or biopsies to detect candida infection or tissue abnormalities, respectively [10] [25]

[13] Many studies use a visual analogue scale (VAS) as a subjective measure of pain symptoms, such as 0 to 10 to rate the pain, with 0 indicating no pain and 10 indicating the worst possible pain. [9]
[14] Refer to Episode 89 for discussion on oral self-care.

Complimentary assessments by medical providers may include:

- Blood tests to assess complete blood count (e.g., to detect anemia), blood glucose levels, nutritional deficiencies, thyroid function, serum antibodies for Sjögren syndrome, etc.
- Allergy testing
- Gastric reflux tests
- Medication change, or short-term medication cessation to determine if symptoms are alleviated. (Note a change in medication would be under medical supervision as some medications cannot be stopped abruptly)
- Diagnostic imaging (e.g., MRI, CT scan, or other imaging tests)
- Psychological evaluation [9] [10] [25]

The average delay in BMS diagnosis is 34 to 41 months, often due to a lack of understanding of this syndrome and the need for individuals to consult various specialists. This can further exacerbate the anxiety and stress faced by people with BMS. [9] [10]

Management

BMS is a complex condition to manage. Treatment involves a multidisciplinary approach and depends on whether the person has primary or secondary BMS. Treatment of secondary BMS is based on the underlying cause. [10]

The lack of definitive treatment for primary BMS can make BMS management very challenging for the clinician and frustrating for the client. Clinicians should have open discussions with clients, setting expectations and realistic management goals. Clients should be informed that management is symptomatic and not curative, and although complete remission is the goal, it may not always be possible. Management strategies for primary BMS include topical, systemic, and nonpharmacologic therapies. The approach is usually a combination of pharmacologic and nonpharmacologic therapies. Often a referral to an orofacial pain specialist is necessary to establish the correct diagnosis, provide the appropriate management, and avoid unnecessary office visits, and inappropriate treatments. [9] [14]

Topical therapies

Topical BMS therapies may include clonazepam, capsaicin, topical anesthetics, and saliva replacement products.

Clonazepam

Clonazepam is a benzodiazepine usually used as an anticonvulsant. Both topical application via oral disintegrating tablets and systemic use of clonazepam have shown favourable results in BMS pain relief for 2-6 months. Clonazepam demonstrates its analgesic ability by inhibiting neurological transduction and transmitting the pain signal. Topical clonazepam was shown to be superior to systemic use in providing rapid pain analgesia, but for a shorter duration. Individuals have reported rapid positive effects within 10 minutes upon dissolving the clonazepam tablet intraorally, with the recurrence of pain in 3-4 hours. Topical clonazepam route is simple, with a rapid and shorter duration of action, which allows repetitive use and lower risk of common systemic

adverse effects, such as drowsiness, dizziness, and unsteadiness. It allows individuals to have better self-control over pain relief in their daily activities. [9] [17]

Capsaicin
Capsaicin is the active (spicy) ingredient in chili peppers with analgesic properties. Capsaicin is used for managing other peripheral neuropathies, including diabetic neuropathy and postherpetic neuralgia experienced after shingles. Capsaicin binds to certain nociceptors (special nerve cell endings that initiate pain sensation), and continuous exposure to capsaicin causes desensitization of afferent nociceptors (C fibres). For BMS management, the rinse or gel is regularly applied to the tongue dorsum. Initial increase in unpleasant burning sensations, followed by a period of relief has been reported. Side effects reported include gastrointestinal upset and the product's unacceptable taste. Further studies are needed to evaluate its long-term efficacy. [9] [10] [19]

Topical anesthetics
Bupivacaine lozenge has been reported to decrease oral burning pain compared to placebo, but it increased taste alterations and had no effect on xerostomia. Lidocaine rinses temporarily lessened pain or burning. Both bupivacaine and lidocaine only provided temporary relief. [9]

Saliva replacement products
Moisturizing rinses have been used to help manage xerostomia and Sjögren syndrome. They may also offer supportive care for BMS associated with xerostomia. [9] [26]

Other topical therapies
Several other topical therapies have been investigated, including extra virgin olive oil with lycopene, 10% urea, melatonin, chamomile, aloe vera, and benzydamine hydrochloride. However, none of these approaches were found to be effective compared to placebo. [9]

Systemic therapies
Systemic management of BMS may include the administration of alpha-lipoic acid, anticonvulsants, antidepressants, and antipsychotics.

Alpha-lipoic acid
Alpha-lipoic acid (ALA) is a naturally occurring antioxidant made by the body and found in foods, such as tomatoes, potatoes, broccoli, and brussels sprouts. Clinical use of ALA includes management of diabetic neuropathy. Its application for BMS is widely studied and shows promise as a treatment modality. Several trials have shown statistically significant improvements when administering 600-800 mg ALA daily for one to two months compared to placebo, with mean visual analogue scale (VAS) improvements ranging from 55% to 90% depending on the study. ALA is typically well tolerated with little or no adverse effects. [9] [17]

Anticonvulsants
Systemic use of clonazepam has been found to be beneficial in managing BMS symptoms. The improvement may be partially attributed to the anxiolytic (anxiety reducing) properties of benzodiazepines, which block peripheral and central neuropathic mechanisms associated with BMS. A statistically significant reduction in pain was demonstrated for clonazepam, although improvements in taste alterations and xerostomia were not significant. Clonazepam may provide longer pain relief due to its rapid absorption and 90% bioavailability within 1-4 hours after oral administration and its long half-life of 30-40 hours.

Despite promising results, benzodiazepines should be used with caution, especially in older adults, due to potential adverse effects (e.g., drowsiness, dizziness) and drug interactions (e.g., benzodiazepines enhance CNS depressant effects of alcohol and other depressants). [9]

Gabapentin and pregabalin (Lyrica) are used to treat neuropathic pain conditions such as diabetic neuropathy and postherpetic neuralgia. Similar advantages in BMS pain were seen with gabapentin or pregabalin use in short- and long-term studies. The combination of ALA and gabapentin may provide more favourable results. [17]

Antidepressants
Several selective serotonin reuptake inhibitors (SSRIs) are used to treat depression and chronic pain. For example, fluoxetine showed significant reductions in depression, anxiety, and pain in individuals with BMS.

Several other SSRIs have demonstrated efficacy in managing BMS symptoms, including sertraline, paroxetine, and citalopram. However, most evidence comes from case studies with limited trials available.

Serotonin-norepinephrine reuptake inhibitors (SNRIs) including venlafaxine, duloxetine, and milnacipran have also been reported (mostly through case reports) to significantly relieve pain and improve quality of life. [9]

Tricyclic antidepressants such as amitriptyline and nortriptyline are commonly used to treat chronic neuropathic pain. These medications at low doses may be useful in managing BMS, although their use may be contraindicated in individuals with dry mouth as they can worsen xerostomia. [10] [17]

Antipsychotics
Antipsychotics have been used to manage other neuropathic conditions, such as trigeminal neuralgia. However, there are few studies on their efficacy in managing BMS, with most of the evidence from case studies. For example, olanzapine caused significant improvement in BMS for individuals unresponsive to antidepressant therapy. Other antipsychotics including aripprpiprazole, levosulpride, and amisulpride also showed positive responses.

However, the safety profile of antipsychotics is often a point of concern, particularly in the older population. Thus, without significant evidence through clinical trials clinicians should be weary of prescribing these medications. [9] [27]

Combinations of the above medications are an option. However, further studies are required to determine optimal regimens. Also, it is important to titrate the drugs slowly and carefully, with close monitoring for any potential adverse effects. [9]

Cannabis[15]
Cannabis and its constituents (e.g., cannabinoids) have been researched for almost half a century since the discovery of the chemical structure of its main active component, delta-9-tetrahydrocannabinol (THC). Cannabis has a range of therapeutic benefits, such as an analgesic for chronic pain, antispasmodic for multiple sclerosis, anticonvulsant for epilepsy, nausea suppressant for chemotherapy, and appetite stimulant for cachexia (wasting). Cannabis has also been proposed for BMS treatment. [28] [29] [30] [31]

In an open-label, single-arm pilot study by Gambino et al. (2021), seventeen participants with BMS were treated with an oil-based full cannabis plant extract (1 g of cannabis in 10 g of olive oil) for 4 weeks. The results showed cannabis oil treatment was associated with a statistically significant improvement in oral symptoms over time, and levels of anxiety and depression also reduced significantly. None of the participants had to stop the treatment due to side effects. However, larger and properly defined randomized controlled trials, with different therapeutic approaches or placebo control, are required to ascertain the clinical efficacy of cannabis products compared with standard BMS medical treatment. [30]

Nonpharmacologic therapies
Types of nonpharmacologic therapies for BMS management include low level laser therapy, cognitive behavioural therapy, acupuncture, and physical barriers.

Low level laser therapy[16]
Low level laser therapy (LLLT) or photobiomodulation is a low intensity light therapy. Most studies have shown effectiveness of LLLT in reducing BMS pain, although there was great diversity in the laser protocols. The reduction in pain and burning sensations by LLLT has been attributed to various mechanisms. It provides analgesic and anti-inflammatory effects by increasing the release of endogenous pain inhibitors such as serotonin and endorphins and decreasing release of inflammatory mediators (e.g., prostaglandins, bradykinin). Nonetheless, the majority of LLLT studies did not compare LLLT with placebo groups, and the placebo effect of laser therapy can be high. LLLT might be able to contribute to BMS pain relief, with the possibility of being used along with pharmacological and psychological treatment for better outcomes. [16] [17] [19]

[15] Refer to Episode 58 for detailed discussion on cannabis and oral health. Cannabis is also discussed in Episodes 55, 76, 86, 88, 104, and 105.
[16] Refer to Episode 24 for more information on low level laser therapy.

Cognitive behavioural therapy
Cognitive behavioural therapy (CBT) is a type of psychotherapy used to manage conditions, such as depression, anxiety, stress, and chronic pain. Several studies have demonstrated a positive response to CBT for BMS management, particularly in combination with pharmacologic therapies, such as ALA. Further research is required to determine optimal combinations of therapies with CBT. [9] [25]

Acupuncture
There is emerging interest in acupuncture as an adjunct therapy to pharmacologic treatment of BMS due to its analgesic results on significant VAS score reduction within the first two months of therapy. Long-term follow-up, between 18 and 24 months after the initial acupuncture treatment, suggests a sustained decreased level of burning sensation and improved quality of life. It has been proposed that acupuncture increases lip microcirculation, which in turn reduces the localized collection of inflammatory mediators, providing relief from burning pain. However, BMS acupuncture studies to date have been nonrandomized clinical trials, lacked control groups, and/or had follow up of less than two months post-treatment. Further studies on the potential of acupuncture as a complementary therapy are required. [17]

Physical barriers
There is some evidence that covering the dorsal surface of the tongue with a physical barrier provides short-term symptom relief. López-Jornet et al. tested the efficacy of BMS treatment with physical barriers alone (2011) or in combination with aloe vera topical extract (2013). The barrier consisted of a single-use transparent, low-density polyethylene sheath (.01 mm in thickness), which covered the tongue from tip to the posterior third. The protector was worn for 15 minutes three times a day for two months, to prevent the continuous rubbing of the tongue against the teeth or dentures. The authors reported a statistically significant improvement in VAS scores for the tongue protector group compared to the placebo group without a barrier. No adverse effects were reported.

In their later study, a tongue protector was used alone, or in a combination with a topical herbal gel, or with a placebo-containing gel. Positive effects were reported with the combination of the physical barrier and topical aloe vera. However, the VAS scores for pain did not differ significantly between groups. [9] [32] [33] [34]

A 2016 Cochrane review investigated the effectiveness and safety of symptom relief interventions and changes in quality of life (QoL), taste, and feeling of dryness in people with BMS.

Twenty-three studies (assessing 1,121 participants; 83% female), published between 1995 and 2015 were included in the review. All 23 treatments were compared to a placebo. Treatments included antidepressants, antipsychotics, antiseizure drugs, types of tranquillizers, saliva stimulants, dietary supplements, directed energy waves, physical barriers, psychological therapies, and treatments applied to the oral mucosa.

Overall, the authors found very low-quality evidence for each short- and long-term outcome investigated (i.e., symptom relief, changes in QoL, taste, feeling of dryness, and side effects) in all of the assessed treatments.

The authors concluded due to the limited number of clinical trials at low risk of bias, there is insufficient evidence to support or refute the use of any interventions in managing BMS. Further clinical trials, with improved methodology and standardized outcome sets are required to establish which treatments are effective. Future studies are encouraged to assess the role of treatments used in other neuropathic pain conditions and psychological therapies in the treatment of BMS. [8]

Self-help measures

There is no known way to prevent BMS. However, measures that may help to reduce BMS discomfort include:

- Staying hydrated to help ease dry mouth[17]
- Sucking on ice chips
- Avoiding alcohol and tobacco products[18]
- Limiting acidic or spicy foods and beverages (e.g., tomatoes, carbonated beverages, coffee)
- Avoiding products with cinnamon or mint
- Using milder or low flavour oral care products
- Using stress management techniques [25]

Coping strategies

Strategies to help cope with the challenges of BMS symptoms may include:

- Practicing relaxation exercises (e.g., yoga).
- Focusing on pleasurable activities, such as physical activities or hobbies.
- Staying socially active by connecting with family and friends.
- Joining a chronic pain support group.
- Practising good sleep habits, such as going to bed and getting up at about the same time each day and getting enough sleep.
- Talking to a mental health provider to learn coping strategies. [25]

Take home messages

- BMS is a chronic orofacial pain condition that is challenging to diagnose and manage.
- Etiology of BMS is complex and multifactorial. BMS remains a poorly understood and often poorly managed condition with serious debilitating effects.
- Diagnosis of BMS is based on exclusion of local or systemic causes. Psychological factors further complicate diagnosis and BMS management.[5]
- Although oral health professionals play a central role in the diagnosis, the management of BMS often benefits from multidisciplinary collaboration between oral health and medical professionals.

[17] Refer to Episode 55 for additional strategies to manage xerostomia.

[18] Refer to Episode 101 for discussion on tobacco use and cessation and Episodes 104 and 105 for information on substance use and oral health, including tobacco and alcohol.

- It is critical for oral health professional to be cognizant of the signs and symptoms of BMS, in order to diagnose it at the immediate onset of symptoms and manage or refer clients appropriately. This, ultimately, will improve the quality of life of clients with BMS and reduce the load on healthcare systems.
- Educating the client about the nature of BMS and setting realistic expectations for pain management are crucial elements of the treatment plan.
- Despite several decades of BMS research, there is still more to learn on the pathogenesis and management of this condition. Further well-designed research with long-term follow up is required to determine optimal treatments and standardize care for clients with BMS.

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Client Resources

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National Institute of Dental and Craniofacial Research, November 2023
https://www.nidcr.nih.gov/sites/default/files/2023-12/burning-mouth-syndrome.pdf

Burning Mouth Syndrome
National Institute of Dental and Craniofacial Research, November 2023
https://www.nidcr.nih.gov/health-info/burning-mouth

Burning Mouth Syndrome, Merck Manual Consumer Version, September 2022
https://www.merckmanuals.com/en-ca/home/mouth-and-dental-disorders/lip-and-tongue-disorders/burning-mouth-syndrome

Additional Resources

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