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Management Of Burning Mouth Syndrome: A Literature Review

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Abstract: Burning Mouth Syndrome (BMS) is a chronic disorder characterized by a burning sensation in the oral cavity without visible clinical lesions or identifiable medical causes. Its etiology is multifactorial, involving neurological, hormonal, psychological, and local factors, and it most commonly affects postmenopausal women. This narrative literature review synthesized findings from five key articles, including four narrative reviews and one bibliometric study, addressing the etiopathogenesis, clinical classification, diagnosis, and management of BMS. The analysis highlights major risk factors, challenges in differentiating BMS from odontogenic pain, and the range of therapeutic options reported. The reviewed literature emphasizes that BMS significantly impairs quality of life and is often associated with psychological comorbidities. Bibliometric evidence indicates a growing global research trend over the past two decades, with particular focus on cytokines, chronic pain mechanisms, and therapeutic strategies. Management approaches include pharmacological agents, non-pharmacological interventions, and psychological support, yet no definitive treatment has been established. Given its complex and idiopathic nature, the optimal management of BMS requires a multidisciplinary approach tailored to patient characteristics and underlying contributing factors.

Keywords: Burning mouth Syndrome; Chronic oral pain; Differential diagnosis; Multifactorial etiology; Multidisciplinary approach; Therapy.

Introduction

Patients who complain of a burning sensation in the oral cavity often present a particular challenge for oral health professionals. This condition becomes more complex when accompanied by pain, which is one of the main causes of suffering and disability, and can significantly reduce quality of life. Burning Mouth Syndrome (BMS) is characterized by oral pain or burning sensations occurring without any visible clinical abnormalities. BMS is defined as a spontaneous burning sensation, pain, discomfort, irritation, or soreness affecting the tongue, lips, or other parts of the oral cavity, often without an identifiable organic cause, thus complicating the diagnostic process for clinicians. In addition to pain and burning sensations, patients with BMS often experience xerostomia (dry mouth), dysesthesia (abnormal sensations), and taste disturbances. The tip and anterior two-thirds of the tongue are the most commonly affected areas, followed by the lateral borders of the tongue, lips, and palate.
The primary form of Burning Mouth Syndrome (BMS) is characterized by burning sensations of the oral mucosa and perioral regions, usually bilateral and symmetrical, without significant clinical or laboratory findings. Burning sensations most frequently occur on the tongue, followed by the lips and hard palate, although this pattern does not appear in all cases. The pain typically arises suddenly and is constant, though intensity may vary. When limited only to the tongue, the condition is termed glossopyrosis, whereas involvement of other oral sites (including the tongue) is called oropyrosis.

Determining the true prevalence of Burning Mouth Syndrome (BMS) remains difficult, primarily due to the lack of consistent classification systems, definitive diagnostic criteria, and low awareness among oral health professionals. Many authors also fail to clearly distinguish between the syndrome (BMS) and the burning mouth symptom itself. International studies report that the prevalence of BMS ranges from 0.6% to 15%. BMS generally occurs in middle-aged to elderly individuals, with an age range of 38 to 78 years, and its prevalence appears to increase with age in both men and women. A strong female predilection has been reported, with female-to-male ratios ranging from 3:1 to 16:1. Although the precise mechanisms underlying this

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gender difference remain unclear, some researchers associate it with biological, psychological, and sociocultural factors.

Epidemiological studies indicate that BMS is most frequently observed in women during peri- and postmenopausal periods, with prevalence reaching 12–18%. It is rarely reported in individuals under 30 years of age and has not been documented in children or adolescents. Most studies indicate that the majority of BMS patients are middle-aged women, particularly those in postmenopause, with an average age ranging between 55 and 60 years. Menopause is defined as the permanent cessation of ovarian function, typically occurring in middle-aged women. The increasing population of menopausal women, often accompanied by systemic conditions such as osteoporosis, cardiovascular disorders, cervical cancer, breast cancer, and others, raises concern regarding additional health problems, including BMS. Menopausal signs and symptoms vary depending on lifestyle, geographic differences (urban versus rural), and socioeconomic status.

BMS is recognized as a multifactorial disorder with a physiological basis, although its pathophysiological mechanisms remain poorly understood. Most BMS patients experience burning sensations in the mouth due to a combination of local, systemic, and psychogenic factors. Local contributing factors include dental treatment, Candida infection (candidiasis), bacterial infection, local allergic reactions, temporomandibular joint (TMJ) dysfunction, and salivary gland disorders. Improperly designed or ill-fitting dentures are also important local causes. Although Candida infection is frequently associated with BMS, its role is considered secondary. Studies have reported higher counts of Candida species and coliform bacteria such as Enterobacter and Klebsiella in BMS patients. Local allergic reactions to dental restorative materials such as mercury, or certain denture materials, have also been implicated. Additionally, dysfunction of stomatognathic system muscles and parafunctional habits contribute, with approximately 34% of BMS patients experiencing xerostomia due to inadequate salivary secretion.

Psychogenic factors are regarded as one of the main etiologies of Burning Mouth Syndrome (BMS), particularly after iron deficiency. Psychological stress related to loss events, such as death or separation, is often associated with the onset of BMS symptoms. In addition to local treatment, BMS management should also address underlying psychological disorders, particularly depression. However, anxiety is more frequently observed in BMS patients than depression and may be associated with cancerphobia (an excessive fear of cancer), which is considered a trigger of idiopathic BMS.

Based on etiology, BMS can be classified into two main types: Primary BMS, which is idiopathic (with no identifiable cause) and does not demonstrate neuropathic abnormalities, and Secondary BMS (also known as burning mouth sensation), which is more strongly associated with organic factors or adverse drug reactions.

Method

The methods used to evaluate and diagnose Burning Mouth Syndrome (BMS) emphasize the importance of thorough anamnesis and supporting examinations. The approaches applied in the literature reviewed generally consisted of narrative reviews, bibliometric analyses, and consensus reports. The articles highlighted the need for a comprehensive understanding of the etiopathogenesis of BMS, clinical classification, and both pharmacological and non-pharmacological management strategies.

Several studies in the form of narrative literature reviews addressed the epidemiology, risk factors, and diagnostic complexity of BMS, emphasizing its multifactorial etiology, which includes local, systemic, and psychogenic factors (Putra et al., 2019; Aravindhan et al., 2014; Alsabbagh et al., 2022). Another study applied bibliometric analysis to systematize publication data over the past two decades, grouping research trends into major citation clusters such as cytokines, chronic pain, and therapy (Lv et al., 2025).

In addition, some publications reviewed the clinical aspects of BMS diagnosis and management, including the challenges of differential diagnosis with odontogenic pain. The most frequently reported pharmacological therapies include anxiolytics/benzodiazepines, anticonvulsants, antidepressants, atypical antipsychotics, and histamine receptor antagonists, although no definitive therapy has been established for curing BMS (Charleston, 2013; Alsabbagh et al., 2022).

Overall, the reviewed articles emphasized that BMS diagnosis still relies heavily on comprehensive anamnesis, clinical examination, and exclusion of other conditions that may mimic its symptoms, while its management requires a multidisciplinary and individualized approach.

Result and Discussion

After conducting a search for scientific articles that met the inclusion criteria of the review, it was found that all of the articles consisted of narrative reviews, consensus reports, and case reports, which illustrated the complexity of diagnosing BMS, pharmacological and surgical management approaches, as well as the challenges of its differential diagnosis with odontogenic pain in dental practice. The subjects reviewed in the articles included adult patients with paroxysmal facial pain symptoms, both in individual case reports and in broader reviews of the clinical literature.

Table 1. Summary of Journal Article Review

Researcher, Research Location, Article Title and Journal	Research Objectives and Design	Data Sources and Sample Size	Research result
Putra INGJ et al. (2019), Management of Burning Mouth Syndrome: A Literature Review.	To assess and evaluate the management/therapy of burning mouth syndrome (BMS). Design: Narrative literature review.	Scientific articles/journals on BMS. Sample size not specified.	BMS is idiopathic oral dysesthesia, often in postmenopausal women; multifactorial etiology (local, systemic, psychogenic factors).
Kejia Lv et al. (2025), Studies on Burning Mouth Syndrome in the Past 20 Years: A Bibliometric and Visualised Analysis International	Based on bibliometric research and data visualization, this is a global study (bibliometric analysis). Design: Narrative literature review.	Source: Web of Science Core Collection. Sample size not specified.	Findings showed that between 2003–2023, 1,080 articles on BMS were analyzed. Main research clusters included cytokines, chronic pain, and therapy, with trending keywords such as stomatodynia, symptoms, and anxiety.
Charleston L. (2013), Burning Mouth Syndrome: A Review of Recent Literature.	To review recent literature on BMS (classification, diagnosis, quality of life impact, pathophysiology, comorbidities, and pharmacological/non-pharmacological therapies). Design: Narrative review.	Published literature (67 references cited in the article). No sample size..	Reported therapies beneficial for some patients include anxiolytic/benzodiazepine, anticonvulsants, antidepressants, atypical antipsychotics, histamine receptor (H2) antagonists, and dopamine agonists.
Aravindhan R. et al. (2014), Burning Mouth Syndrome: A Review on Its Diagnostic and Therapeutic Approach.	To present a review on epidemiology, clinical presentation, classification, etiopathogenesis, diagnosis, and management (therapy) of BMS. Design: Narrative review article.	Literature and references published up to the time of writing. No sample size.	Chronic, multifactorial, idiopathic BMS requires an interdisciplinary approach; no definitive therapy available.
Alsabbagh R. et al. (2022), Burning Mouth Syndrome: Etiology, Clinical Presentations, and Treatment Alternatives. |	To summarize current literature on etiopathogenesis (causes), diagnosis, and therapy of BMS, with a particular focus on pharmacological management. Design: Narrative review.	Scientific literature available up to the time of writing. No sample size.	BMS is chronic and idiopathic, often associated with psychological disorders; pharmacological treatment is symptomatic, but no definitive therapy exists.
Abetz L. (2009), Burning Mouth Syndrome and Psychological Disorders.	To review the relationship between BMS and psychological disorders, particularly anxiety, depression, and other psychosomatic factors. Design: Narrative review.	Data from clinical research articles, case reports, and epidemiological studies related to BMS and psychological conditions. No sample size.	BMS is frequently found in patients with psychological disorders, especially anxiety and depression. Psychological factors are not only consequences of chronic burning pain but may also act as predisposing factors.
Tan HL et al. (2022), A Systematic Review of Treatment for Patients with Burning Mouth Syndrome.	To systematically evaluate the effectiveness of various treatment modalities for BMS patients. Design: Systematic review.	Data obtained from major electronic databases. Included articles: controlled clinical trials, interventional studies, and randomized trials on BMS treatments. Sample size varied across studies, totaling >2,800 patients from 23 trials..	Interventions tested include pharmacotherapy (clonazepam, antidepressants, anticonvulsants, capsaicin, alpha-lipoic acid) and non-pharmacological options (CBT, acupuncture, laser therapy, electrical stimulation). Strongest evidence supports clonazepam (both topical and oral) as relatively consistently effective therapy.
Grushka M. (1987), Clinical Features of Burning Mouth Syndrome.	To describe the clinical characteristics of patients with	Data from patients presenting to clinic with BMS symptoms.	Majority of patients were postmenopausal women. Main symptom: burning sensation

Researcher, Research Location, Article Title and Journal	Research Objectives and Design	Data Sources and Sample Size	Research result
	BMS. Design: Descriptive clinical observational study.	Sample size: 91 diagnosed BMS patients.	primarily on the tongue (glossodynia), followed by lips, buccal mucosa, and palate. Some patients also reported taste disturbances, dry mouth, and psychological disorders (anxiety/depression).
Scala A. (2003), Update on Burning Mouth Syndrome: Overview and Patient Management.	To provide a comprehensive review on BMS. Design: Narrative review.	Data from relevant clinical research, case reports, and epidemiological studies on BMS. No sample size.	BMS is defined as chronic burning sensation in oral mucosa without clear clinical or laboratory abnormalities. Epidemiology: more common in postmenopausal women; prevalence varies 0.7–15%.
Dokkedal-Silva V. (2019), Clonazepam: Indications, Side Effects, and Potential for Nonmedical Use	To critically review clinical indications of clonazepam, common and serious side effects, and potential for misuse beyond medical indications. Design: Narrative review.	International literature (research articles, reviews, clinical reports, and pharmacological data). No sample size.	Medical indications of clonazepam: mainly for epilepsy, anxiety disorders, panic disorders, restless leg syndrome, REM sleep disorders, and certain chronic pain conditions (including BMS).

The absence of truly curative therapy makes the management of Burning Mouth Syndrome (BMS) a major challenge for healthcare practitioners, while also creating significant difficulties for patients. Transparent communication between doctors and patients is therefore essential to establish rational therapeutic goals and expectations. Patients must understand that the treatment of BMS is generally symptomatic rather than permanently curative. Although complete recovery remains desirable, it cannot be guaranteed in all cases. Further research is needed to determine the most effective therapeutic methods and to accelerate remission. Ideally, such research should be conducted through randomized controlled clinical trials with a double-blind design, placebo use, and long-term follow-up. However, implementing such studies faces certain technical and ethical barriers, particularly given the involvement of patients with chronic pain.

The initial stage in managing Burning Mouth Syndrome (BMS) is a comprehensive evaluation of differential diagnoses and addressing conditions that mimic BMS. The goal is to rule out possible secondary BMS and establish a primary BMS diagnosis. Once primary BMS is confirmed, therapeutic options may include topical agents, systemic medications, or non-pharmacological approaches. Treatment is generally recommended to begin with conservative methods, such as topical therapy or non-pharmacological interventions, as they carry a lower risk of adverse effects compared to systemic drugs. However, current scientific evidence regarding the effectiveness of these methods remains limited and largely weak, with positive results often based only on individual clinical experience. Most studies use the Visual Analogue Scale (VAS) as a subjective tool to measure pain improvement. The following section will discuss in more detail the risk–benefit profile of pharmacological therapies and their recommended dosages.

Topical Therapy

Clonazepam

Clonazepam is a potent benzodiazepine that acts as a GABA-A agonist with a long duration of action, available in both systemic and topical formulations. It has long been used to treat conditions such as insomnia, anxiety, and depression. In the context of BMS, clonazepam has shown effectiveness in relieving symptoms both in the short and long term. Topical clonazepam, typically in the form of tablets dissolved in the mouth at doses of 0.5–3.0 mg per day, has been clinically proven to reduce pain scores based on the Visual Analogue Scale (VAS). Although its exact mechanism is not fully understood, it is believed that topical clonazepam provides rapid analgesic effects through membrane stabilization of nerve fibers and oral mucosal cells. This topical approach is considered safer than systemic administration due to its lower risk of side effects.

Capsaicin

Capsaicin is the active compound in chili peppers that has been studied for its effectiveness in reducing BMS symptoms. It works by activating TRPV1 receptors on C-fiber nerves, initially inducing pain and inflammation, but with repeated use causing desensitization and reduced pain sensation. Capsaicin has also proven beneficial in other neuropathic conditions, such as diabetic neuropathy and postherpetic neuralgia. In BMS management, capsaicin is used as an oral rinse or gel (0.01–0.025%) applied to

the tongue three times daily for two weeks. Initial effects often include increased burning sensations, followed by pain reduction. Studies show short-term symptom improvement, though long-term effectiveness requires further investigation.

Local Anesthetics

Local anesthetics such as 5% bupivacaine in lozenge form have been studied as an alternative BMS therapy. Patients took the lozenges three times daily after meals for 14 days. Results showed significant pain reduction compared with the control group. The drug was generally well tolerated, though it may alter taste and has no effect on oral dryness. In addition, lidocaine solution can also be used for temporary pain relief, but its effect is short-lived, and its use should be limited to routine dental care visits.

Saliva Substitutes

Saliva supplements, such as lysozyme and lactoperoxidase combinations (e.g., Biotène®), are commonly used in patients with xerostomia and Sjögren's syndrome. Although direct evidence for their effectiveness in BMS is limited, these supplements may help alleviate burning sensations. Patients may use them as needed. Alternatives include xylitol gum, oral patches, and artificial saliva.

Other Topical Therapies

Other topical agents studied include olive oil with lycopene, 10% urea, melatonin, chamomile, Aloe vera, and benzydamine hydrochloride. However, available evidence shows that none of these agents demonstrated greater effectiveness than placebo in reducing symptoms based on VAS measurement.

Systemic Therapy

Several studies have evaluated systemic therapies for Burning Mouth Syndrome (BMS), with varying results. Tricyclic antidepressants such as amitriptyline, desipramine, imipramine, clomipramine, and nortriptyline are frequently used in BMS management at low initial doses (5–10 mg/day), gradually increased to around 50 mg/day. However, these drugs are less recommended for patients with dry mouth, as they may worsen symptoms.

Other antidepressants, particularly Selective Serotonin Reuptake Inhibitors (SSRIs) such as sertraline (50 mg/day), paroxetine (20 mg/day for 8 weeks), and duloxetine (30–60 mg/day), have shown significant improvement in oral burning symptoms. Certain antipsychotics, including amisulpride and levosulpiride (50 mg/day for 24 weeks), have also been reported effective, with relatively good patient adherence, particularly for short-term treatment.

Alpha-lipoic acid (ALA) at a dose of 600 mg/day for two months, either alone or combined with other therapies, acts as both an antioxidant and neuroprotective agent. ALA helps prevent nerve damage from free radicals, supports the regeneration of other antioxidants such as vitamins C and E, and increases intracellular glutathione levels. Its use has been shown to reduce symptoms, particularly in patients with idiopathic dysgeusia, although it should be combined with gastric protection drugs to prevent gastrointestinal irritation.

Oral capsaicin capsules (0.25%, three times daily for one month) have also shown benefits in reducing pain intensity, though some patients experienced gastric pain, warranting caution. Additionally, low-dose benzodiazepines such as clonazepam (0.5 mg/day) and alprazolam (0.25–2 mg/day) are often used, especially in BMS patients with anxiety disorders. Their mechanism is thought to involve modulation of the underlying neuropathological processes.

Nutritional supplementation, particularly with B-complex vitamins (e.g., vitamin B12 and folic acid) and minerals such as iron and zinc, has also been reported to improve patients' conditions by reducing homocysteine levels and increasing hemoglobin levels, thereby alleviating oral symptoms.

In peri- and postmenopausal women, hormone therapy is one of the treatment options. Conjugated estrogens (e.g., Premarin 0.625 mg/day for 21 days) combined with medroxyprogesterone acetate (10 mg/day from days 12 to 21), administered for three cycles, have been shown to reduce burning sensations and improve oral cytological profiles.

In addition to pharmacological interventions, psychological therapies such as cognitive behavioral therapy (CBT) have also been beneficial in some patients. Reports indicate that combining psychotherapy with pharmacotherapy yields more significant improvements compared to monotherapy.

Conclusion

Burning Mouth Syndrome (BMS) is a complex disorder with multifactorial causes, and to date no curative therapy has been identified. Management of BMS is primarily aimed at symptom relief and must be tailored to the clinical condition of each patient. A combined approach, which may include topical agents, systemic therapy, nutritional supplementation, and psychological support, is considered beneficial in improving symptoms and patients' quality of life. Nevertheless, scientific evidence regarding the long-term benefits of these therapies remains limited, as most studies are observational in nature and rely on subjective tools such as the Visual Analogue Scale (VAS). Therefore, randomized controlled trials with more rigorous designs and long-term follow-up are needed to establish the safest and most effective treatment strategies. In addition, individualized approaches,

effective communication between healthcare providers and patients, and the establishment of realistic expectations are essential factors for the successful management of BMS.

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