



BURNING MOUTH SYNDROME: PATHOPHYSIOLOGY, CLINICAL CHARACTERISTICS, AND MANAGEMENT

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ABSTRAK

Burning Mouth Syndrome (BMS) merupakan kondisi nyeri orofasial kronis yang ditandai dengan sensasi terbakar, kesemutan, atau disestesia pada mukosa oral tanpa adanya lesi mukosa yang tampak secara klinis maupun penyebab lokal yang jelas. Kondisi ini masih menjadi tantangan diagnostik dalam praktik kedokteran gigi karena manifestasinya berkaitan dengan berbagai faktor neuropatik, psikoneurologis, saliva, sistemik, dan psikologis. Kajian ini bertujuan mendeskripsikan patofisiologi, karakteristik klinis, diagnosis, dan tatalaksana BMS dengan penekanan pada mekanisme neuropatik, aspek psikoneurologis, perubahan saliva, serta dampaknya terhadap kualitas hidup. Penelitian ini menggunakan *narrative literature review* dengan pendekatan tematik terhadap 25 artikel yang terdiri atas *case report*, *case-control study*, *randomized clinical trial*, *observational study*, *cohort/follow-up study*, *scoping review*, dan *systematic review* yang diterbitkan pada 2021–2025. Hasil kajian menunjukkan bahwa BMS merupakan kondisi multifaktorial yang melibatkan *small fiber neuropathy*, disfungsi nosiseptif trigeminal, perubahan dopaminergik sentral, perubahan saliva dan mikrobioma oral, faktor psikologis, gangguan tidur, komorbiditas sistemik, serta mekanisme terkait penggunaan obat. Diagnosis bersifat klinis dan berbasis eksklusi melalui evaluasi kondisi mukosa oral, keluhan saliva, gangguan pengecap, status nutrisi, kondisi sistemik, riwayat penggunaan obat, dan faktor psikologis. Tata laksana meliputi edukasi pasien, koreksi faktor sekunder, terapi farmakologis topikal atau sistemik, fotobiomodulasi, terapi laser intensitas rendah, krioterapi oral, dukungan psikologis, serta perawatan multidisiplin yang disesuaikan dengan kondisi pasien. BMS memerlukan pendekatan diagnostik komprehensif dan tatalaksana individual untuk mencegah perawatan dental yang tidak diperlukan serta meningkatkan luaran klinis dan kualitas hidup pasien.

Kata Kunci: *burning mouth syndrome; nyeri orofasial neuropatik; patofisiologi; diagnosis; tatalaksana*

ABSTRACT

Burning Mouth Syndrome (BMS) is a chronic orofacial pain condition characterized by burning, tingling, or dysesthetic sensations in the oral mucosa without clinically visible mucosal lesions or identifiable local causes. It remains a diagnostic challenge in dental practice because its clinical manifestations are associated with neuropathic, psychoneurological, salivary, systemic, and psychological factors. This literature review aimed to describe the pathophysiology, clinical characteristics, diagnosis, and management of BMS, with particular emphasis on neuropathic mechanisms, psychoneurological aspects, salivary alterations, and their impact on quality of life. A narrative literature review with a thematic approach was





conducted using 25 selected articles, including case reports, case-control studies, randomized clinical trials, observational studies, cohort/follow-up studies, scoping reviews, and systematic reviews published between 2021 and 2025. The findings indicate that BMS is a multifactorial condition involving small fiber neuropathy, trigeminal nociceptive dysfunction, central dopaminergic alterations, salivary and oral microbiome changes, psychological factors, sleep disturbances, systemic comorbidities, and drug-related mechanisms. Diagnosis is primarily clinical and exclusion-based, requiring evaluation of the oral mucosa, salivary complaints, taste disturbances, nutritional status, systemic conditions, medication history, and psychological factors. Management strategies include patient education, correction of secondary causes, topical or systemic pharmacotherapy, photobiomodulation, low-level laser therapy, oral cryotherapy, psychological support, and individualized multidisciplinary care. BMS requires a comprehensive diagnostic approach and individualized management to prevent unnecessary dental treatment and improve clinical outcomes and quality of life.

Keywords: *burning mouth syndrome; neuropathic orofacial pain; pathophysiology; diagnosis; management*

INTRODUCTION

Burning Mouth Syndrome (BMS) is a chronic orofacial pain condition characterized by burning, tingling, or dysesthetic sensations in the oral mucosa, commonly affecting the tongue, lips, palate, gingiva, or multiple oral sites, without clinically evident mucosal lesions that adequately explain the symptoms. Patients may also report dry mouth, taste disturbances, bitter or metallic taste, psychological distress, sleep disturbances, and reduced quality of life (Canfora et al., 2022, 2023; Kong et al., 2024; Park & Kho, 2022). The multidimensional nature of these complaints makes BMS a diagnostic challenge in dental practice because the intensity of symptoms is not necessarily proportional to observable clinical findings. Systematic evidence also indicates that BMS may involve both neuropathic and psychogenic components, highlighting the need for a broader understanding of its underlying mechanisms (Orliaguet & Misery, 2021).

From a dental perspective, BMS should not be viewed solely as a disorder originating from local mucosal abnormalities or infection. Neuropathic mechanisms have received increasing attention, particularly the involvement of peripheral small fiber neuropathy and alterations in pain processing. A recent systematic review reported evidence supporting the involvement of small fiber neuropathy in a substantial proportion of patients with BMS, although the underlying mechanisms remain heterogeneous (Kouri et al., 2024). Clinical findings also suggest that BMS is associated with alterations in salivary characteristics and biomarkers, which may contribute to the perception of oral discomfort and dryness (Canfora et al., 2023; Jang et al., 2024; Kong et al., 2024). These findings indicate that understanding the neurophysiological and salivary aspects of BMS is important in establishing an appropriate clinical assessment.

BMS also exhibits a complex biopsychosocial profile. Psychological characteristics, pain perception, sleep disturbances, and quality of life have been associated with the clinical presentation of the condition (Canfora et al., 2022; Orliaguet & Misery, 2021). Several studies have further reported associations between BMS and systemic or comorbid conditions. Hypertension has been examined in relation to pain and psychosocial characteristics in patients with BMS (Adamo et al., 2023), while a nationwide cohort study reported an increased risk of BMS among patients with migraine (Kim et al., 2022). Medication-related mechanisms should also be considered because BMS-like symptoms have been reported in association with certain





pharmacological treatments, including antidepressants (Alesa et al., 2023). In addition, recent research has explored alterations in the oral microbiome and metabolome, particularly among patients with BMS accompanied by psychiatric symptoms, further supporting the multifactorial nature of the condition (Chongqing Medical University Research Group, 2024).

The diagnostic and therapeutic complexity of BMS makes a comprehensive review particularly relevant to dentistry. Diagnosis is primarily based on clinical assessment and exclusion of other local and systemic conditions that may produce similar symptoms. Evaluation may include assessment of oral mucosal conditions, salivary complaints, taste disturbances, systemic comorbidities, medication history, psychological factors, and the overall impact of symptoms on quality of life (Canfora et al., 2022; Kong et al., 2024; Park & Kho, 2022). Treatment approaches are similarly diverse and may include pharmacological therapy, patient education, low-level laser therapy, photobiomodulation, oral cryotherapy, and psychological or supportive interventions. Recent clinical studies have investigated clonazepam, melatonin, low-level laser therapy, photobiomodulation, cryotherapy, vitamin supplementation, probiotics, and other pharmacological approaches, with varying therapeutic responses (Castillo-Felipe et al., 2022; Loncar-Brzak et al., 2022; Garcia-Martinez et al., 2024; Lu et al., 2025; Sakata et al., 2022). Evidence concerning treatment outcomes also indicates that improvement should not be assessed solely from pain reduction but should include quality of life and other patient-reported outcomes (Mendes Abreu et al., 2024; Mendes de Abreu et al., 2024).

Based on these considerations, this review aims to discuss the pathophysiology, clinical characteristics, diagnosis, and management of BMS based on recent literature published between 2021 and 2025. Particular attention is given to neuropathic mechanisms, salivary and oral changes, psychological and systemic factors, diagnostic considerations, and current therapeutic approaches. This review is expected to provide a comprehensive overview that can support dental practitioners and dentistry students in understanding BMS as a multifactorial chronic orofacial pain condition and in considering a more appropriate and individualized approach to its diagnosis and management.

RESEARCH METHODS

This study employed a narrative literature review with a thematic approach to examine the pathophysiology, clinical characteristics, diagnosis, and management of Burning Mouth Syndrome (BMS). The literature consisted of 25 journal articles published between 2021 and 2025 and included case reports, case-control studies, randomized controlled trials, cross-sectional studies, observational studies, cohort or follow-up studies, systematic reviews, and scoping reviews. The review process was designed to identify and synthesize recent evidence relevant to the clinical understanding and management of BMS in dental practice.

The inclusion criteria comprised articles published between 2021 and 2025 that discussed BMS in relation to pathophysiology, neuropathic mechanisms, psychoneurological factors, clinical characteristics, psychological factors, salivary complaints, salivary biomarkers, oral microbiota, differential diagnosis, pharmacological management, photobiomodulation or low-level laser therapy, and case reports relevant to dental practice. Articles that did not specifically address BMS or did not provide information relevant to the objectives of this review were excluded.

The literature selection and analysis were conducted through several stages, including identification of relevant articles, screening based on the inclusion criteria, extraction of important information, and thematic synthesis. The extracted information included authors,



publication year, study design, research focus, and the main contribution of each article to the understanding of BMS. The findings from the selected studies were then compared and organized according to their similarities and relevance to the objectives of the review. Because the included studies had heterogeneous designs, populations, interventions, and outcomes, the findings were synthesized narratively rather than statistically through meta-analysis.

The selected literature was organized into four major thematic areas: (1) neuropathic and psychoneurological pathophysiology, (2) clinical characteristics and diagnosis, (3) management strategies, and (4) clinical implications in dentistry. The thematic synthesis was subsequently used to develop an integrated discussion of the mechanisms underlying BMS, its clinical presentation and diagnostic considerations, and current management approaches. The overall literature review process is presented in Figure 1.

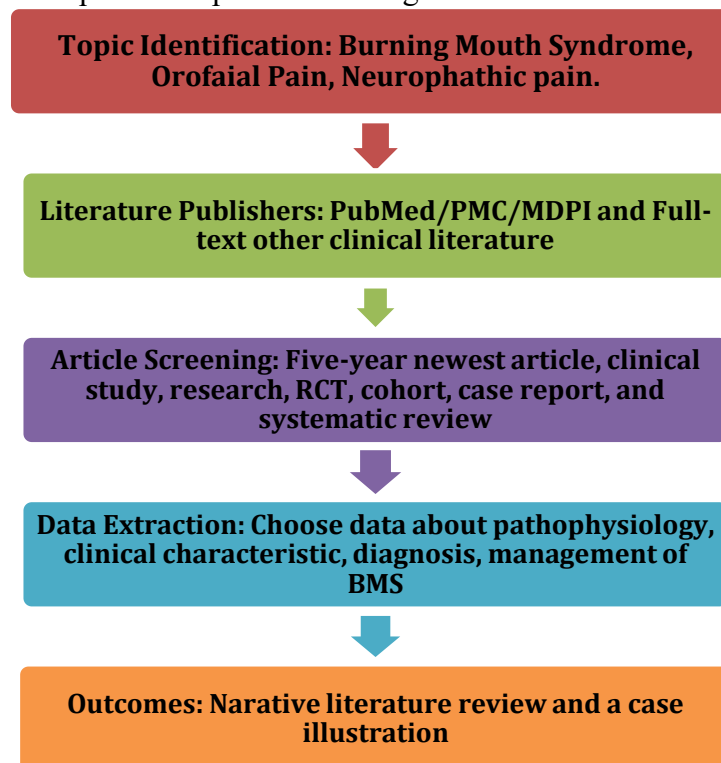


Figure 1. Method - Flow Chart

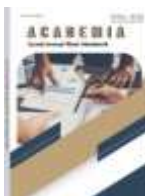
RESULT AND DISCUSSION

Result

This paper presents 25 journals used as reference materials in this literature review (Table 1). The studies were categorized according to design, publication year, and relevance to pathophysiology, clinical characteristicss, diagnosis, and management of Burning Mouth Syndrome.

Table 1. Result of Literature Studies

No.	Authors (Publisher, Publication year)	Study Design	Method and Focus	Result and Key Findings
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1	Gunendran T, Bai P, Subhedar R, et al (Cureus 2023)	Case report	An unusual case of Burning Mouth Syndrome in and Adult Male: A Case Report.	Adult male BMS without mucosal lesions; possible TRPV1 and P2X3 involvement.
2	Bhaiyya PS, Sonar PR, Paul P, et al. (Cureus 2024)	Case report	Burning Mouth Syndrome in Association with Angular Cheilitis: A case Report.	BMS with angular cheilitis; clinical management and possible role of nutritional deficiency and Candida infection.
3	Watanabe M, Araki W, Takao C, et al. (Frontiers 2024)	Case report	A Case with Burning Mouth Syndrome Followed by Dementia with Lewy Bodies: A Case Report.	BMS preceding dementia with Lewy bodies, central nervous system and dopaminergic involvement.
4	Adamo D, Canfora F, Calabria E, et al. (International Journal of Environmental Research and Public Health, 2023)	Case-control study	Burning Mouth Syndrome and Hypertension: Prevalence, Gender Differences and Association with Pain and Psycho-Social Characteristics - A case-control Study.	Association between BMS, Hypertension, gender and psychosocial characteristics.
5	Canfora F, Calabria E, Pecoraro G, et al (Journal of Oral Rehabilitation, 2022)	Case-control study	The Use of Self-report Questionnaires in an Analysis of the Multidimensional Aspects of Pain and a Correlation with the Psychological Profile and Quality of Life in Patients with BMS A case-control study.	Multidimensional Pain, psychological profile, and quality of life in BMS.
6	Kouri M, Adamo D, Vardas E, et al (International of Molecular Sciences, 2024)	Systematic review	Small Fiber Neuropathy in Burning Mouth Syndrome: A Systematic Review.	Small fiber neuropathy, Nav1.7, Nav1.9, P2X3, and TRPV1 as neural biomarkers in BMS.



7	Garcia Martinez A, Lopez-Jornet P, et al (Biomedicines, 2024)	Randomized single-blind clinical	Burning Mouth Syndrome Treated with Low-Level Laser and Clonazepam: A randomized, single-blind clinical trial.	Comparison of low-level laser therapy, clonazepam, and combination therapy using VAS and salivary biomarkers.
8	Loncar-Brzak B, Skrinjar I, Brailo V, et al. (Dentistry Journal,2022)	Randomized clinical trial	Burning Mouth Syndrome (BMS) - Treatment with Verbal and Written Information, B Vitamins, Probiotics, and Low-Level Laser Therapy.	Education, vitamin B, probiotics, and LLLT in BMS; outcomes include VAS and OHIP-14
9	Sakata KI, Hato H, Sato J, et al (Biopsychosocial Medicine, 2022)	Prospective follow-up study	Pharmacotherapy in relieving the symptoms of Burning Mouth Syndrome: A 1-year follow-up study.	Long-term pharmacotherapy for BMS, including tricyclic antidepressants and clonazepam.
10	Mendes de Abreu J, Nunes T, Almiro PA, et al. (Journal of Clinical, 2024)	Prospective study	Long-term benefits of photobiomodulation therapy on health-related quality of life in BMS patients: A retrospective study.	Long-term photobiomodulation effect on health-related quality of life and medication reduction.
11	Umezaki Y, Egashira R, Motomura H, TTT, Naito T, (Cureus, 2024)	Retrospective observational study	Relationship between clinical course of treatment for BMS in early period and aggression using Rosenzweig picture frustration study: A retrospective observational study	Aggression and early treatment response in BMS; psychoneural implications.
12	Watanabe M, Takao C, Liu Z, et al (Frontiers in Pain Research, 2022)	Cohort study	The effectiveness and adverse events of amitriptyline and aripiprazole in very elderly patients with BMS	Effectiveness and adverse events of amitriptyline and aripiprazole in elderly BMS patients.



13	Alesa A, et al (SAGE Open Medical Case Reports, 2023)	Case report	Antidepressant-induced Burning Mouth Syndrome: A case report.	Drug-induced BMS caused by Antidepressant; Naranjo causality assessment.
14	Mendes Abreu J, et al. (Cureus, 2024)	Scoping review	Evaluating the impact of different treatments on the quality of life in patients with Burning Mouth Syndrome: A scoping review.	Quality-of life outcomes in patients with BMS.
15	Orliaguet M, Misery L (Biomolecules, 2021)	Systematic review	Neuropathic and psychogenic components of Burning Mouth Syndrome: A systematic review.	Neuropathic and psychogenic components of BMS, including neurophysiology and pharmacological/non-pharmacological therapy.
16	Alesa A, et al (SAGE Open Medical Case Report, 2023)	Case report	Antidepressant-induced Burning Mouth Syndrome: A case report.	Drug-induced BMS as an example of medication related neuropathic oral pain.
17	Jang S, Kim J. E., Lee Y. H, Jung W (Journal of Oral & Facial Pain and Headache, 2024)	Clinical pre-post study	Changes in salivary biomarkers of Burning Mouth Syndrome Patients after clonazepam treatment.	Changes in salivary alpha-amylase, cortisol, calmodulin, and IL-18 after topical clonazepam therapy.
18	Gao Y, Yang J, Sun H, Zhou H, et al (BMC Oral Health, 2024)	Open-label randomized controlled trial	Efficacy of Danzhixiaoyao tablets combined with methylcobalamin tablets in the treatments of Burning Mouth Syndrome: an open-label, randomized controlled trial	Danzhixiaoyao plus methylcobalamin compared with methylcobalamin alone; VAS, BAI, BDI, and OHIP-14 outcomes.
19	Lu C, Zhou X, Yang C, et al (BMC Medicine, 2025)	Multi-institutional randomized	Efficacy photobiomodulation combined with oral cryotherapy on oral	Comparison of photobiomodulation, oral cryotherapy,



		d controlled trial	mucosa pain in patients with Burning Mouth Syndrome: A multi- institutional, randomized controlled trial.	combined therapy, and drug therapy.
20	Castillo-Felipe C, Tvarijonavičiute A, Lopez-Arjona M, et al. (Journal of Clinical Medicine, 2022)	Double- blind placebo- controlled RCT	Response to treatment with melatonin and clonazepam versus Placebo in Patients with Burning Mouth Syndrome.	Melatonin plus clonazepam compared with placebo; VAS and salivary biomarkers.
21	Canfora F, Calabria E, Spagnuolo G, et al. (Journal of clinical medicine, 2023)	Cross- sectional study	Salivary complaints in Burning Mouth Syndrome: A Cross- sectional study on 500 patients.	Xerostomia and sialorrhea complaints in 500 BMS patients and associations with systemic/psychologica l comorbidities and medications.
22	Chongqing Medical University Research Group (Journal of Oral Microbiology, 2024)	Cross- sectional study	Comprehensive analysis of the oral microbiota and metabolome change in patients of Burning Mouth Syndrome with Psychiatric symptoms.	Oral microbiota and salivary metabolome change in BMS patients with psychiatric symptoms.
23	Kong M. S, Kim M. J., Kim Y.Y., Chang J. Y., Kho H. S. (Oral Diseases, 2024)	Cross- sectional survey	Clinical characteristics and salivary biomarkers of Burning Mouth Syndrome.	Clinical characteristics and salivary biomarkers in primary, secondary, and intermediate BMS groups.
24	Zhang Q, Tan Z, Ma Q, Guo J, Yang Y. (BMC Oral Health, 2025)	Cross- sectional survey	Analysis of Pain prognosis, medication efficacy, treatment willingness and influencing factors in patients with Burning Mouth Syndrome: A Cross-sectional survey.	Pain prognosis, medication efficacy, willingness for treatment, and factors influencing BMS therapy response.
25	Sakata KI, Hato H, Sato J, et al.	Prospectiv e cohort/ trial	Pharmacotherapy in relieving the symptoms	One-year follow-up pharmacotherapy



(Biopsychosocial Medicine, 2022)	follow-up study	of Burning Mouth Syndrome: A 1-year follow-up study.	effectiveness and adverse events for BMS symptoms.
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Based on Table 1, the 25 studies reviewed indicate that *Burning Mouth Syndrome* (BMS) is a multifactorial condition involving neuropathic, psychological, clinical, and systemic factors. Several studies identified the involvement of *small fiber neuropathy*, Nav1.7, Nav1.9, P2X3, and TRPV1 in the pathophysiology of BMS (Kouri et al., 2024; Orliaguet & Misery, 2021). Clinically, BMS is generally characterized by oral burning sensations and pain without apparent mucosal lesions and may be accompanied by xerostomia, psychological disturbances, and systemic conditions.

Table 1 also shows that BMS management includes both pharmacological and non-pharmacological therapies. Clonazepam, antidepressants, methylcobalamin, photobiomodulation, *low-level laser therapy*, and combination therapies have been reported to improve symptoms and/or quality of life in patients with BMS (Sakata et al., 2022; Garcia Martinez et al., 2024; Gao et al., 2024; Lu et al., 2025). Overall, these findings indicate that the diagnosis and management of BMS require a comprehensive approach that considers clinical characteristics, psychological factors, and underlying comorbidities.

Discussion

Pathophysiology of Burning Mouth Syndrome

The pathophysiology of Burning Mouth Syndrome (BMS) cannot be explained by a single mechanism. In general, recent literature indicates that BMS is a multifactorial condition involving peripheral neuropathic components, central process, and psychological factors. A case report in an adult male by Gunendran et al. (2023) highlighted the possible involvement of nociceptive receptors such as TRPV1 and P2X3, which play a role in transmitting heat, burning, and pain sensations in the oral mucosa. This mechanism supports the concept that the burning sensation in BMS not always originates from mucosal inflammation, but may arise from activation or dysfunction of sensory pathways.

Kouri et al. (2024) identified small fiber neuropathy as one of the important mechanisms in BMS. Small nerve fibers are involved in the transmission of pain, temperature, and burning sensations. Dysfunction of these fibers may trigger hyperalgesia, allodynia, dysesthesia, or persistent burning sensations, even when the oral mucosa appears clinically normal. The involvement of Nav1.7, Nav1.9, P2X3, and TRPV1 channels suggests a molecular basis that is relevant to neuropathic pain.

Central components are also important. Watanabe et al. (2024) reported a case of BMS followed by dementia with Lewy bodies and emphasized the potential involvement of the dopaminergic system. This broadens the understanding that BMS may be associated with neurotransmitter dysfunction and the central nervous system, rather than being limited to local disturbances in the oral cavity. Studies on migraine and BMS also support a relationship between BMS and altered central pain processing.

Psychoneurological aspects are reflected in studies by Canfora et al. (2022), Umezaki et al. (2024), and various other studies linking BMS with anxiety, depression, aggression, sleep quality, and quality of life. Psychological factors should not be understood as the sole cause of BMS, but rather as factors that may amplify pain perception through modulation of the central nervous system, limbic system, and stress axis.



Clinical Characteristics

The main clinical characteristics of BMS is a persistent or recurrent burning sensation in the oral mucosa, often lasting for more than three months, with no significant mucosal abnormalities found during clinical examination. The most commonly affected site is the tongue, particularly the anterior or lateral region. However, symptoms may also involve lips, gingiva, or the entire oral cavity.

Patients may complain of dry mouth, bitter or metallic taste, taste disturbances, tingling sensations, stinging sensations, and pain that worsens in the afternoon or evening. Canfora et al. (2023), in a study involving 500 patients, showed that salivary complaints such as xerostomia and sialorrhea are important clinical components of BMS. A salivary biomarker study in 2024 also indicated that BMS may be associated with variations in salivary biomarkers, hyposalivation, and different symptom patterns among primary, secondary, and intermediate BMS groups.

The clinical characteristics of BMS may also vary according to sex, age, comorbidities, and psychosocial profile. Adamo et al. (2023) discusses the association of BMS with hypertension, gender differences, pain, and psychosocial characteristics. In elderly patients, Watanabe et al. (2022) evaluated the effectiveness and side effects of amitriptyline and aripiprazole, demonstrating that age-related factors and drug tolerance should be considered clinically.

Case reports have shown that BMS may occur in uncommon conditions, such as in adult males, patients with angular cheilitis, patients with dementia with Lewy bodies, or patients experiencing adverse effect from antidepressant medications. These findings reinforce the need to evaluate local, systemic, neurological, and pharmacological factors before establishing a diagnosis of BMS.

Diagnosis and Differential Diagnosis

The diagnosis of BMS is clinical and based on exclusion. Dentists must ensure that the burning sensation is not caused by mucosal lesions, candidiasis, angular cheilitis, allergic reactions, mechanical trauma, salivary disorders, nutritional deficiencies, diabetes, thyroid disorders, anemia, medication side effects, or other systemic diseases. A comprehensive evaluation should include examination of the oral mucosa, salivary status, denture condition, parafunctional habits, and medication history.

Additional examinations may be directed according to clinical suspicion, such as complete blood count, vitamin B12 levels, folate, ferritin, blood glucose, HbA1c, thyroid function tests, fungal culture or fungal examination, and salivary assessment. In cases with prominent neuropathic symptoms, neurological examination, orofacial pain assessment, and interdisciplinary referral may be considered.

Important differential diagnoses include oral candidiasis, erosive lichen planus, atrophic glossitis, contact stomatitis, drug reactions, xerostomia due to Sjögren's syndrome or medication use, trigeminal neuralgia, post-traumatic trigeminal neuropathic pain, persistent idiopathic dentoalveolar pain, and psychosomatic disorders. Case reports involving angular cheilitis and drug-induced BMS indicate that a diagnosis of BMS should not be made too hastily without excluding secondary causes.

Self-report questionnaires, the Visual Analogue Scale (VAS), OHIP-14, Beck Anxiety Inventory, Beck Depression Inventory, and quality-of-life instruments may help assess pain dimensions, psychological impact, and therapeutic response. This approach is consistent with studies by Canfora et al. (2022), Gao et al. (2024), and other clinical studies included in the references.



Pharmacological and Non-Pharmacological Management

The management of BMS should be individualized because the causes and mechanisms may differ among patients. The initial step is patient education, emphasizing that BMS is a real chronic pain condition and not merely a psychological complaint. Education helps reduce anxiety, improve adherence, and establish realistic expectations regarding treatment response.

Commonly discussed pharmacotherapies include topical or systemic clonazepam, tricyclic antidepressants such as amitriptyline, aripiprazole, melatonin, methylcobalamin, and combination approaches tailored to the patient's condition. Sakata et al. (2022) demonstrated the importance of long-term monitoring of BMS pharmacotherapy, while Watanabe et al. (2022) emphasized caution in prescribing medications for very elderly patients because of the risk of adverse effects. Studies on salivary biomarker changes after clonazepam treatment suggest the possibility of biological indicators of therapeutic response.

Widely studied non-pharmacological therapies include low-level laser therapy and photobiomodulation. Garcia Martinez et al. (2024) compared low-level laser therapy, clonazepam, and combination therapy. Loncar-Brzak et al. (2022) evaluated education, vitamin B supplementation, probiotics, and LLLT. Mendes de Abreu et al. (2024) demonstrated the long-term benefits of photobiomodulation on quality of life, while Lu et al. (2025) reported the benefits of combining photobiomodulation with oral cryotherapy in a multicenter randomized controlled trial.

Psychological factors should be actively addressed. Patients with anxiety, depression, sleep disturbances, or chronic stress may benefit from counseling, cognitive behavioral therapy, psychiatric support, or stress management. A biopsychosocial approach is important because pain perception in BMS is influenced not only by the condition of the mucosa, but also by central nervous system modulation.

Implications in Dentistry

BMS often brings patients to dentists because the symptoms are felt in the oral cavity. Therefore, dentists play an important role as first-line clinicians who must distinguish BMS from mucosal diseases, infections, dental abnormalities, salivary disorders, or other neuropathic pain conditions. Careful intraoral examination and empathetic communication are essential to avoid unnecessary dental treatment.

In dental practice, BMS should be suspected in patients with chronic burning sensations, clinically normal oral mucosa, recurrent symptoms, taste disturbances or dry mouth, and a history of anxiety, depression, sleep disturbances, systemic comorbidities, or the use of certain medications. A multidisciplinary approach involving internists, neurologists, psychiatrists, and oral medicine specialists may improve diagnostic accuracy and treatment outcomes.

The term “neuropathic orofacial pain” in relation to BMS should be used carefully. Not all cases of BMS are purely neuropathic, however, substantial clinical and molecular evidence supports the presence of neuropathic components in many patients. Therefore, BMS is more appropriately understood as a multifactorial condition with neuropathic, psychogenic, salivary, systemic, and environmental contributions.

Case Illustration

A 58-year-old woman presented to a dental clinic with a complaint of burning sensations on the tongue and palate for the past seven months. The symptoms were mild in the morning and worsened in the afternoon. The patient also reported dry mouth, bitter taste, and difficulty enjoying spicy foods. Intraoral examination showed that oral mucosa appeared normal, with no ulceration, white plaques, severe erythema, or traumatic lesions. Denture examination did not reveal any clear mechanical trauma.





The medical history revealed the patient had controlled hypertension and had been taking antidepressant medication several months earlier. The initial evaluation included salivary assessment, candidiasis screening, blood glucose testing, vitamin B12, ferritin, thyroid function tests, and assessment of anxiety and sleep quality. The working diagnosis was Burning Mouth Syndrome with possible contributions from xerostomia, psychological factors, and medication-related side effects.

Initial management included patient education, elimination of oral irritants, hydration advice, medication evaluation, in collaboration with the treating physician, topical therapy as indicated, and interdisciplinary referral when necessary. If secondary causes are excluded and the pain persists, therapies such as topical clonazepam, photobiomodulation/ low-level laser therapy, psychological support, and quality-of-life monitoring may be considered. This case illustrates that BMS requires an exclusion-based diagnostic approach and multidisciplinary management.

CONCLUSION

Burning Mouth Syndrome is a complex chronic orofacial pain condition that often causes burning complaints in the oral mucosa without clear clinical abnormalities. Based on the articles analyzed in this study, BMS has multifactorial mechanisms involving small fiber neuropathy, trigeminal dysfunction, changes in nociceptive ion channels, central dopaminergic disturbances, salivary and microbiota alterations, systemic comorbidities, psychological factors, sleep disturbances, and medication side effects.

The diagnosis of BMS should be established through a clinical and exclusion-based approach. Oral examination, medication history, nutritional status, systemic disease, salivary complaints, taste disturbances, and psychological profile should be thoroughly evaluated. Management of BMS requires an individualized and multidisciplinary approach that includes education, correction of secondary factors, pharmacotherapy, low-level laser therapy, photobiomodulation, oral cryotherapy, psychological support, and quality of life monitoring. For dentists, understanding BMS as a manifestation of orofacial pain with neuropathic components is essential to prevent unnecessary dental procedures and to ensure more accurate diagnosis and management.

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