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Review Articles

Burning Mouth Syndrome: How Should the Clinician Interpret?

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Abstract: The Burning Mouth Syndrome (BMS), a complex condition characterized by chronic pain or a burning sensation in the oral cavity without evidence of lesions or detectable changes in clinical and laboratory examinations. Highlighting its higher prevalence in women, especially in the age group of 50 to 70 years, the text explores the possible etiologies of BMS, including neuropathies, endocrine dysfunctions, psychological factors, among others. Through a literature review, the classifications of BMS are discussed, ranging from progressive daily pain to intermittent pain, in addition to the importance of distinguishing between primary and secondary BMS for effective treatment. The management of BMS requires a multidisciplinary approach, with treatments that range from pharmacological therapies to alternative methods such as acupuncture. The article also emphasizes the need for a detailed clinical assessment to identify underlying causes and propose appropriate therapy, considering local, systemic, nutritional, hormonal, and psychological factors. It concludes that BMS represents a significant diagnostic and therapeutic challenge, requiring comprehensive investigation and interdisciplinary collaboration to alleviate symptoms and improve the quality of life of patients.

Keywords: Burning Mouth Syndrome; Orofacial Pain; Oral Neuropathy.

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1. Introduction

Burning Mouth Syndrome (BMS) is identified as a chronic condition of intraoral pain without apparent clinical or laboratory causes. Also known by terms such as glossodynia and stomatodynia, BMS is characterized by pain that does not originate from visible lesions or detectable changes in examinations. The pain is often described as a burning sensation or tingling, mainly on the tongue and in other areas of the oral cavity [1]. The prevalence of BMS is more significant in women, especially in the age group of 50 to 70 years, suggesting a possible connection with hormonal changes of menopause [1]. Although the exact etiology of BMS is unknown, factors such as neuropathies, endocrine dysfunctions, and psychological aspects are considered influential [1, 2].

The management of BMS involves a multidisciplinary approach, with treatments ranging from pharmacological therapies, such as the use of antidepressants and anticonvulsants, to alternative methods like acupuncture, which has shown promising results in improving symptoms and the quality of life of patients [1, 2]. Recent research also indicates the potential of mouthwashes and toothpastes containing Cannabidiol (CBD) and Cannabigerol (CBG) to alleviate the symptoms of BMS [3,4]. This article aims to review the most recent research on Burning Mouth Syndrome.

2. Literature Review

Burning Mouth Syndrome (BMS) presents heterogeneously, with classifications based on daily symptomatic characteristics, which facilitates the identification of the condition and the choice of the most appropriate treatment. The categories include:

2.1 Type 1: Progressive Daily Pain

Type 1 patients report no symptoms upon waking, with a gradual increase in pain throughout the day, reaching maximum intensity at night. This variant has been associated with systemic conditions such as nutritional deficiency and diabetes, reflecting the influence of metabolic and nutritional factors on the manifestation of BMS [5].

2.2 Type 2: Constant Pain

The constant pain, which negatively impacts sleep, is typical of this group. Studies point to an association with dysfunctions of the salivary glands, particularly in patients using antidepressants, which may compromise parotid function and exacerbate burning symptoms [6].

2.3 Type 3: Intermittent Pain

This type is characterized by episodes of pain that occur intermittently, alternating with periods without pain. The manifestation in less typical areas, such as the oral floor and oropharynx, and the association with allergic reactions, especially to food additives, suggest an allergic mechanism or hypersensitivity as a contributing factor [7].

2.4 Clinical Classification

2.4.1 Primary or Idiopathic BMS

Identified when no local or systemic organic causes can explain the symptoms. This classification challenges clinicians due to the complexity in management and treatment [1,8].

2.4.2 Secondary BMS

Established when evaluations reveal changes that may be contributing to the symptoms, allowing for targeted therapeutic approaches [9]. Treatment strategies for BMS should be individualized, addressing both the local and systemic aspects identified, to relieve symptoms and improve the quality of life of patients [8].

2.5 Etiopathogenesis

Understanding the pathophysiology of Burning Mouth Syndrome (BMS) remains challenging, reflecting its multifactorial nature involving a complex interaction of local, systemic, and psychogenic factors [7,9].

2.6 Local Factors

2.6.1 Oral Factors

Investigations into saliva composition and the oral environment suggest a significant relationship between salivary gland dysfunction and BMS. Case-control studies indicate changes in the salivary composition of BMS patients, including elevated levels of sodium, potassium, chlorine, calcium, and immunoglobulins [10]. These changes suggest a possible dysfunction of the salivary glands.

2.7 Parafunctional Habits

The prevalence of parafunctional habits, such as biting lips and cheeks, bruxism, lingual interposition, and mouth breathing, has been frequently associated with BMS. Research indicates that parafunctional activities resulting from inadequate occlusion, or the use of dental prostheses are present in up to 61% of BMS patients. Changes in occlusal plane position, reduction of lingual space, and increased vertical dimension are common findings among these patients [11].

A study conducted by Hershkovich and Nagler (2004) with 180 patients presenting idiopathic BMS and complaints of dysgeusia and/or xerostomia revealed a potential oral neuropathy or disruption in neurological transduction as contributing factors, resulting in

changes in salivary composition. This discovery underscores the importance of neural mechanisms in the etiology of BMS [12].

2.8 Infections by *Candida sp.* and Bacteria

The presence of Candida albicans has been frequently observed in BMS patients, although its clinical significance continues to be debated. Infections by other bacteria such as Enterobacter, Klebsiella, and Staphylococcus aureus have also been reported. The presence of Helicobacter pylori in the oral mucosa, detected through biopsies and molecular biology techniques, was notably higher in BMS patients than in individuals without oral symptoms, indicating a possible pathogenic role [13].

2.9 Nervous System Changes

Changes in the interpretation of stimuli by the central nervous system, possibly misrecognized as pain, suggest that BMS may be a form of phantom oral pain. Evidence suggests a dysfunction in the dopaminergic system, manifested by a decrease in presynaptic dopaminergic inhibition and, consequently, an increase in neuronal excitability [7, 9].

2.10 Allergic Reactions

The involvement of allergens in BMS is complex and controversial. Allergies to dental materials, including acrylates and metals such as nickel, mercury, gold, and cobalt, were investigated, but more recent studies have not established a direct relationship with BMS. However, in type 3 patients, allergies to foods, dyes, preservatives, and additives were identified in a significant proportion, pointing to a potential connection between allergies and BMS symptoms [1, 14].

2.11 Vascular Changes

Research on the origin of various pains associated with BMS suggests a crucial role for changes in the vascular circulatory system, particularly those related to inflammation. Studies of mucosal blood flow by laser Doppler have revealed significant changes in BMS patients, including a general reduction in blood perfusion and increased vascular activity in certain areas, such as the palate. These findings indicate that BMS symptoms may be attributed to changes in the control of neurovascular microcirculatory units in the oral mucosa [15].

2.12 Systemic Factors

2.12.1 Deficiency in Sex Hormones

The connection between BMS and deficiencies in sex hormones, particularly in postmenopausal women, is well documented, with studies showing that about 46% of these women present BMS symptoms, improving in approximately 60% of cases after hormone replacement therapy [16].

2.12.2 Nutritional Deficiencies

The association of BMS with nutritional deficiencies, including iron, folic acid, zinc, and B-complex vitamins, has been reported, with evidence suggesting improvement of symptoms after appropriate replacement therapy [17].

2.12.3 Systemic Diseases

Studies have associated BMS with various systemic diseases, including diabetes mellitus, where metabolic alterations in the oral mucosa, along with xerostomia and candidiasis, can contribute to the symptoms [9].

2.12.4 Use of Systemic Medications

The relationship between the use of certain medications and BMS has been observed, especially with medications that affect salivary flow, including antihypertensives, antidepressants, and antiretroviral agents like efavirenz. Clonazepam has shown efficacy in relieving BMS symptoms, with remission rates of up to 40% [11, 18].

2.12.5 Psychological Factors

Depression, anxiety, and other psychological conditions are frequently reported in patients with BMS. Case-control studies have revealed a high prevalence of mood changes and psychiatric disorders associated with BMS, with therapies focused on psychological aspects proving to be effective in reducing symptoms [6, 8, 9].

2.13 Clinical Approach to Burning Mouth Syndrome (BMS)

When evaluating a patient with symptoms suggestive of BMS, anamnesis and physical examination must be meticulously conducted to identify signs and symptoms that contribute to an accurate diagnosis and an appropriate therapeutic proposal according to the flowchart in figure 1. BMS is classified as primary when idiopathic, and secondary when there are associated clinical or laboratory evidence, which guides the treatment to address both the symptoms and the underlying causes [19].

In the presence of hyposalivation, a local factor associated with BMS, salivary flow measurement is recommended. The normal flow is equal to or greater than 1 mL/min, with values between 0.7 mL/min and 1 mL/min considered hyposalivation and xerostomia below 0.7 mL/min. The use of artificial saliva and acupuncture are therapeutic approaches that have shown improvement in symptoms and salivary flow [20].

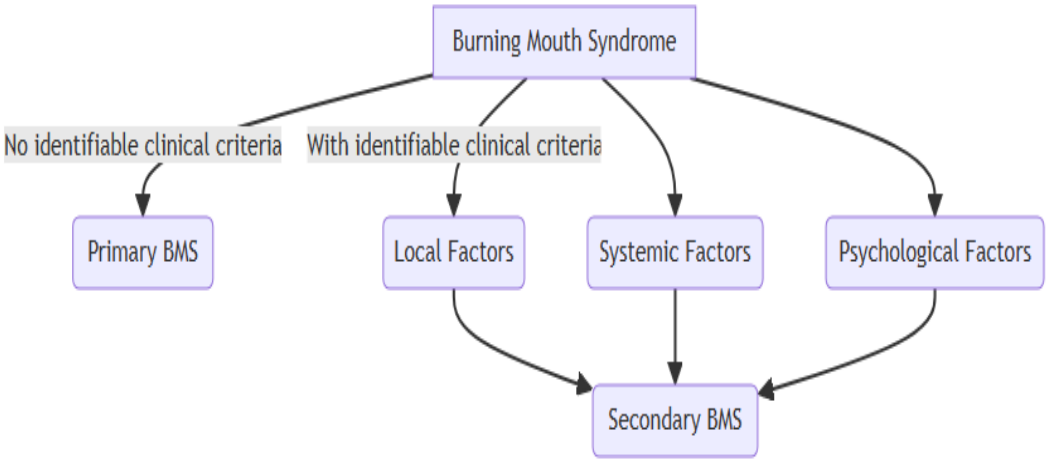

Figure 1: Flowchart of Burning Mouth Syndrome, distinguishing between Primary cases (without clinical criteria) and Secondary cases (with local, systemic, or psychological factors).

The oral examination should also investigate changes resulting from parafunctional habits, such as bruxism or improper use of dental prostheses, which are common in patients with BMS [11]. Interventions such as the use of occlusal splints and prosthetic rehabilitation may be necessary. The presence of infections by microorganisms, especially Candida spp., should be evaluated and treated, if confirmed, with medication [13]. Furthermore, allergic reactions should be investigated and, if present, patients should be advised to avoid the identified allergens to prevent symptom recurrence [14].

It is imperative that the clinician explores possible systemic conditions associated with BMS, such as diabetes mellitus and thyroid disorders, as such conditions may be related to the etiopathogenesis of BMS [5,9]. Nutritional deficiencies, such as in iron, folic acid, zinc, and B-complex vitamins, should be investigated with blood tests and treated appropriately [5]. In menopausal or postmenopausal women, hormonal changes should be considered as possible aggravating factors of BMS [16]. Psychological changes, often associated with BMS, may justify the use of tricyclic antidepressants and benzodiazepines, with evidence of efficacy especially for topical clonazepam [6,9].

3. Final Considerations

Burning Mouth Syndrome (BMS) represents a significant diagnostic and therapeutic challenge due to its multifactorial nature. The distinction between primary and secondary BMS is crucial for the treatment strategy, emphasizing the importance of a thorough clinical evaluation and laboratory tests to identify possible underlying causes. The management of BMS involves a holistic approach that may include the treatment of local conditions, such as hyposalivation and infections, as well as the consideration of systemic, nutritional, hormonal, and psychological factors that may contribute to the patient's symptoms.

The recommendation to measure salivary flow and the use of artificial saliva and acupuncture to treat hyposalivation exemplify the approach focused on specific symptoms. Similarly, correcting parafunctional habits and treating Candida spp. infections are essential to address localized causes that may exacerbate BMS. Furthermore, the investigation of systemic conditions, nutritional deficiencies, and hormonal changes underlines the need for an interdisciplinary approach for the effective treatment of BMS. Finally, considering the psychological dimensions of BMS and the potential use of tricyclic antidepressants and benzodiazepines highlights the complexity of the syndrome and the need for personalized treatments.

It is concluded that success in managing BMS requires not only the recognition and treatment of the direct clinical manifestations but also a comprehensive and multidisciplinary investigation of the possible underlying causes. Cooperation among specialists from different areas is, therefore, fundamental to provide patients with BMS with effective symptom relief and improved quality of life.

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