REVIEW

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Burning mouth syndrome: an update on recent findings

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Abstract

Burning mouth syndrome (BMS) is characterized by a burning sensation of the oral mucosa in the absence of mucosal abnormality. Various local, systemic and psychological factors are associated with BMS, but its aetiology is not fully understood. Recently, significant inroads have been made, producing a better understanding of this complex condition. The aim of the current paper is to explore the condition of BMS in an educational context with the specific outcome of increasing awareness of the condition.

Key words: Burning mouth syndrome, clonazepam, xerostomia, oral dysaesthesia, patient management.

Abbreviation: BMS = burning mouth syndrome.

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IINTRODUCTION

The term 'burning mouth syndrome' (BMS) refers to a chronic oral burning pain, diagnosed in the absence of any visible mucosal abnormality or other organic disease.[1,2] Herein lies the challenge in the initial recognition of the condition by clinicians. The second challenge is that psychogenic factors are a probable cause in the majority of cases[1,2] and the complexities of such morbidity represents an area in which many clinicians do not have a comfortable awareness. BMS therefore presents as an idiopathic condition distinct from the symptom of oral burning that can potentially arise from various local/systemic pathologies and these must be excluded prior to its diagnosis.[1-4] Within this latter group are precipitating factors including nutritional deficiencies, hormonal changes associated with menopause, local oral infections, denture-related lesions, xerostomia, hypersensitivity reactions, medications and a number of systemic conditions including diabetes mellitus.[1,2,5,6] The aim of the current paper is to explore the condition of BMS in an educational context with the specific outcome of increasing awareness of the condition.

A substantial volume of research has focused on BMS during the last two decades. Progress has been made but the condition remains a fascinating, yet poorly understood area, in the field of oral medicine. Previously the condition was substantially unrecognized as a specific entity.

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Epidemiology

Burning mouth syndrome is a disabling, spontaneous, continuous and often intense burning sensation that occurs primarily in a well-defined population of post-menopausal women.[7,8] The mean age of BMS patients is between 55-60 years, with occurrence under 30 being rare.[3] The estimated prevalence of BMS reported in the literature ranges between 0.7 and 4.6 per cent of the general population.[1,3,7] Such variability reflects the lack of accurate diagnostic criteria for BMS, with studies often including all patients with symptoms of oral burning.[6] The use of a consistent classification system based on a universally accepted definition of BMS with stringent diagnostic criteria is essential if the prevalence of this syndrome is to be estimated accurately. The current authors suggest a stringent definition: BMS is a dysaesthesia of the oral mucosa presenting without a detectable organic cause. This definition imposes a significant diagnostic responsibility on the clinician to exclude organic disease but it also allows a degree of latitude to cope with the likely multifactorial aetiology and complex presentation seen in many patients. It also allows the collection of precise clinical and epidemiological data on the BMS group.

Clinical presentation

Pain characteristics

BMS is a chronic pain condition with symptoms that may persist for a prolonged period of time.[2,9] The predominant pain character reported by BMS patients is a prolonged 'burning' sensation of the oral mucosa described as moderate to severe intensity that may vary throughout the course of the day.[1,10-12] The mean severity of pain has been assessed at about 5-8cm on a 10cm visual analogue scale, where 0cm represents no pain and 10cm corresponds to the 'worst possible pain'. The onset of oral pain is generally spontaneous and without any recognized precipitating factors. However, some individuals report a temporal

coincidence with previous events, particularly a dental procedure or stressful life occurrences.[1,6-8] Minimal information is available on the natural course of the condition. In most cases the syndrome follows a protracted course with an average duration of 3.4 years but may last for 12 years or more[4] with recovery in up to two-thirds of patients within 6-7 years of onset.[11,13]

A classification of BMS the authors find clinically useful was proposed by Lamey and Lamb[14] based on the pattern of symptom presentation and progress: Type 1 BMS is characterized by being pain free on awakening, with burning sensations developing in the late morning, gradually increasing in severity during the day and reaching peak intensity by evening;[1,12] Type 2 consists of continuous symptoms throughout the day, often making falling asleep difficult for many individuals; and Type 3 BMS is characterized by intermittent symptoms with pain-free periods during the day and variable presence between days.[12,14]

The classification is not universally applicable but it is a useful indication of prognosis particularly for Type 1 which enjoys a higher rate of resolution than either Types 2 or 3.[1,4] A natural follow-on is that the classification may be very useful in treatment decisions ranging from no active management to closely co-ordinated and often multi-modality treatment.

The location of oral pain is most commonly bilateral and importantly does not follow the anatomical distribution of a peripheral sensory nerve.[4,13] An anatomical distribution raises the very real possibility of organic disease and this clearly requires exclusion to adhere to the strict definition of BMS. The burning most frequently involves the tip and anterior dorsum of the tongue and, to a lesser extent, the coincident anterior hard palate, the lower vestibule and lip.[1,4,13]

Xerostomia and taste aberrations

Taste aberrations and xerostomia (dry mouth) often accompany BMS with xerostomia occurring in 46-67 per cent of cases.[8,11,15] The feeling of oral dryness generally reflects a subjective sensation, rather than actual salivary gland hypofunction[11] and an objective assessment of both spontaneous and stimulated flow is an important part of the clinical examination. Most salivary flow rate studies of BMS patients have shown no decrease in either stimulated or unstimulated salivary flow.[8,14,16,17] This is an important point and should form part of the patient discussion.

Salivary composition has also been examined.[17-21] Recently Nagler and Hershkovich[18] found that BMS patients reporting xerostomia had a normal salivary volume but a compositional alteration with increased albumin, total IgM, and total IgG, which are serum components and not originating within the salivary glands. Understandably, this group proposed that altered salivary ionic composition might play a role in the local neuropathy demonstrated in BMS patients by various studies. A further dissection of this intriguing component may be clinically useful if it translates to an additional area able to be addressed for symptom relief. At present, however, it represents just one of the many complexities of BMS and continues to remind clinicians of the very open-minded approach required in any consideration of BMS, both clinical and academic.

Similarly, distorted taste perceptions often accompany BMS[8,10,11,22] with the dysgeusia frequently presenting as either bitter or metallic, or both.[16] Reciprocal relations between xerostomia and taste aberrations are reported in various studies. Both transport and solubilization of gustatory stimulants are dependent on salivary flow and composition. Therefore alterations in salivary composition may also contribute to changes in taste perception.[18] A significant and clinically useful parameter noted by the authors is that a metallic taste is often one of the first of the presenting symptoms to resolve. Clearly its recognition and monitoring is important. Improvement is an indicator to both the patient and clinician that the condition may be resolving and can be usefully employed to reinforce the positive progress made by the patient.

Aetiopathogenesis

The aetiology of BMS is poorly understood.[10,23] Most support a multi-factorial syndrome involving the interaction of biological and psychological systems.[13] Burning pain tends to be characteristic of many chronic pain conditions associated with nerve damage and somato-sensory abnormalities.[23] A number of aetiologies have been proposed suggesting BMS involves alterations in both the central and peripheral nervous systems.[13]

An interesting placebo-controlled study examined the use of topical clonazepam and reported a decrease in the symptoms associated with BMS.[7] Clonazepam possesses a high affinity for the inhibitory neuro-transmitter GABAa receptor, which is distributed widely throughout the central nervous system but also in the peripheral tissues.[24] Although the functions of the GABAa receptor in the peripheral tissues are poorly understood, it is postulated that changes in the receptor density triggered by hormonal changes, ageing, and stress may be related to the symptoms associated with BMS.[12,25] The effectiveness of topical administration of clonazepam in some subjects highlights a role for both peripheral tissue changes and cell membrane instability in the aetiology of BMS.[12]

Forssell and co-workers observed significantly higher stimulus thresholds using the electrically excited blink reflex test in a small group of BMS patients.[13,23] The study is particularly significant because it is the first attempt to evaluate the peripheral and central neural pathways of the trigeminal system in a group of BMS patients. There was considerable heterogeneity within the findings providing evidence for a generalized, possibly multilevel, abnormality in the processing of somatosensory information in BMS, suggesting a peripheral neurogenic dysfunction in the majority of patients.[23] A smaller subgroup of patients in this

investigation demonstrated a dysfunction located higher within the central nervous system.

Psychological profile

Despite the evidence suggesting that BMS may reflect a dysfunction involving the peripheral and/or central nervous systems, a common thread linking all cases of BMS is an underlying psychiatric problem that, at the very least, contributes to the severity and pattern of the symptoms.[4] The findings of Al Quran[12] demonstrate clearly that psychological factors, especially neuroticism and all of its facets (anxiety, anger, hostility and depression), can be indicators for the severity of BMS symptoms. This is supported by other studies that report greater levels of depression and anxiety in patients with BMS compared with controls.[26-28] There is increasing controversy, however, as to whether depression and anxiety are primary or secondary events to the oral pain.[1]

A study by Al Quran[12] suggests that although patients with BMS have increased psychological stress, there is no significant correlation between the initiation of BMS and stressful life events. This is certainly not a universal finding and it has already been noted in this paper that there is often a temporal relationship between such events and BMS. The association of BMS with psychological factors nevertheless highlights the need for a multidisciplinary approach to provide the most successful treatment.

Clinical management

The apparent variety of factors associated with BMS and its complex presentation in many patients highlights the difficulties inherent in management. The aetiology is poorly understood. It is difficult to isolate specific causes in individual cases and, not surprisingly, the outcome is unpredictable. Notwithstanding these rather negative comments, the authors take a very positive approach to BMS patients and this is reflected in patient progress. There is no panacea but there are a number of steps critical to the process. The common denominator is time and this crosses the boundaries of work-up, treatment, reassessment and the overall clinical course: (1) a detailed history similar to that for any pain complex; (2) a detailed clinical examination; (3) the positive elimination of organic disease; (4) a detailed discussion with the patient; (5) patient acceptance of the diagnosis; (6) patient acceptance of a psychogenic component; (7) confirmation of the diagnosis; (8) ongoing management and maintenance; and (9) referral at any stage for further assessment and treatment.

Paramount to the clinical management of BMS is obtaining the correct diagnosis. Careful assessment and elimination of other possibilities is essential. Investigations and conditions which are considered in the BMS patient work-up include: candidosis; salivary dysfunction, taste aberrations, halitosis; haematology (FBE, iron studies, serum folate, Vit B12); blood biochemistry (fasting sample for blood glucose); sensitivity testing (exclude denture base intolerance); mucosal disease; concurrent psychological conditions; and current medications.

With the obvious time and personal commitment needed the general practitioner must decide if they wish to provide treatment for BMS patients. At this early stage the major service a GDP can provide for their patient is the recognition of the condition. This is a significant failing in both medical and dental practices and many patients are denied the treatment they require and deserve for extended periods. It is a common finding for the duration to extend over several months/years with significant associated morbidity and on occasion at the level where patients feel desperate to the point of self-harm.

It is our belief that successful management is most likely to be achieved in a specialist setting or in conjunction with an oral medicine specialist. At our present stage of development it is very difficult to work patients up in a general practice setting and to successfully use agents that are seen infrequently in dentistry. Consider BMS in a similar light to a complex malocclusion with marked functional restriction but a minor aesthetic component. The role of the GDP is recognition, discussion, patient acceptance of the diagnosis, management (usually referral), ongoing maintenance and long-term follow-up.

In the case of BMS, there are a number of active phases, for example: (1) confirmation of the diagnosis, possibly by employing an anxiolytic agent; (2) ensuring patient understanding and that the patient can see those clinical indicators of anxiety in their own mouth (buccal mucosal irregularity, reactive translucent/opaque areas of keratosis, scalloping of lateral lingual margins, abrasion of the filiform papillae on the anterior dorsum of the tongue and exposure of the fungiform papillae and frothy saliva). Each insignificant when isolated but a powerful point for discussion when joined by the common thread of anxiety; (3) decision on specific patient management strategies which may include any or a combination of: no active treatment, anxiolytics, other psychoactive agents, behavioral modification therapy, relaxation programmes, exercise programmes and self-management strategies. There are few practitioners in any area able to provide all of the above and on many occasions BMS patients will be referred to other practitioners with appropriate expertise for specific management whilst continuing with other treatments; and (4) specific psychological or psychiatric referral.

It is for this reason and due to the complexity of the condition that treatment of these individuals should be approached judiciously. However, BMS is certainly a diagnosis that should be recognizable in the general dental practice and, if appropriate, the patient should be treated either in the practice or more likely referred. Treatment of individuals with psychoactive agents such as clonazepam is best done on the prescription of the

specialist or GMP rather than independently to minimize the risk of medical complication.

CONCLUSION

Although new research continues to emerge, the condition continues to be poorly understood. With advancing knowledge combined with a clear and concise disease definition, a successful multi-disciplinary model to diagnose and treat BMS may be available in the future. Our current level of understanding, which is based largely on the cumulative experience of clinicians who deal with BMS patients, presents major deficiencies. Clinicians and researchers are in a paradoxical situation where the quest for knowledge and understanding is hampered by our intrinsic lack of understanding. The positive aspect is that most patients can be helped and many achieve a complete cure of their condition. It relies, however, on initial recognition and this is the most critical step.

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