Burning mouth syndrome and other oral sensory disorders: A unifying hypothesis

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Burning mouth syndrome (BMS) is a sensory disorder which results in constant, bilateral burning pain of the tongue, lips, and other oral mucous membranes. Atypical odontalgia (AO) is another sensory disorder, usually defined as a toothache-like pain for which no dental cause can be identified. Previous literature has suggested that AO is often associated with a concomitant temporomandibular disorder (TMD). This hypothesis paper explores the possibility that BMS, AO and TMD can be related through hyperactivity of both the sensory and motor components of the trigeminal nerve following loss of central inhibition as a result of taste damage in the chorda tympani and/or the glossopharyngeal nerves.

Key Words: Atypical odontalgia; Burning Mouth Syndrome; Temporomandibular disorder

Clinical studies suggest that BMS is most prevalent in post-menopausal women. Epidemiological data, however, suggest a more even distribution of age and sex (5,6). BMS is often spontaneous with no identified causative factors, but in 30% to 40% of patients onset may be related to a dental procedure, medication usage or prior illness, including an upper respiratory infection. The natural progression of BMS over time is unclear, but spontaneous remission of BMS, even without treatment, may occur after a number of years.

LINKS TO BMS

Headache and various facial pains, pains in other parts of the body, personality and mood changes, especially anxiety and depression, and increased medication usage have all been linked to BMS (6). However, to the best of the authors’ knowledge no causal relationship between other pains and personality has been demonstrated. Other links to BMS include mildly elevated autoantibodies, patient self report of anemia, inadequate diet, chronic infection, oral yeast infection and hormonal therapies, but all are of uncertain significance. Although extensively investigated, most blood studies of nutritional deficiencies in BMS, including those of various B vitamins and zinc, and other conditions such as diabetes mellitus, have usually failed to demonstrate a causal relationship. Similarly,
sensations, such as BMS. Tasters (13) are at a greatest risk of developing phantom oral abnormalities (14). Sensory and autonomic function (9) that could be linked to distortions of the taste function have been reported. Although the relationship of these alterations in salivary composition to BMS is unknown, these changes are suggestive of an alteration in autonomic function (9) that could be linked to distortions of the taste sensation and loss of central inhibition in the trigeminal system (10,11).

In patients with BMS, taste alterations, especially to bitter stimuli in areas of the tongue innervated by the chorda tympani and the glossopharyngeal nerves, have been reported (12,13). Selective damage to the sensation of taste may result in a central loss of inhibition to pain, and may cause spontaneous taste and pain ‘phantoms’ resulting in BMS. This damage may be caused by viral insult, medication or loss of estrogen at the time of menopause, which is known to significantly affect the ability to taste bitter substances at the chorda tympani (10,12,13). Hormone replacement therapy after the onset of BMS may be ineffective in reducing symptoms once damage to bitter taste areas of the tongue has occurred (9).

The pain intensity of BMS has been shown to correlate with the density of fungiform papillae on the tip of the tongue and most BMS patients have been found to be ‘supertaster’ individuals with a high density of fungiform papillae (13). Because each taste bud is surrounded by pain fibres, those with the highest number of taste buds may also have the highest density of pain innervation and appear to consequently be at highest risk at developing abnormalities of taste and oral pain. Oral pain, including BMS, may arise as a result of a central loss of pain inhibition following the selective taste changes outlined above. Also, most BMS patients experience an increase in burning pain following an oral anesthetic rinse, suggesting that the loss of inhibition results in BMS and taste abnormalities (14).

This model, if borne out by further experimental evidence, may explain why postmenopausal women, especially super-tasters (13), are at a greatest risk of developing phantom oral sensations, such as BMS.

Dry mouth has also been reported in BMS (5), although normal salivary flow rates may be present (6). Alterations in salivary constituents including levels of proteins, mucin, selective immunoglobulins, phosphates, pH and buffering capacity have been reported. Although the relationship of these alterations in salivary composition to BMS is unknown, these changes are suggestive of an alteration in autonomic function (9) that could be linked to distortions of the taste sensation and loss of central inhibition in the trigeminal system (10,11).

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