

# Psychological Aspects of Burning Mouth Syndrome

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The etiopathogenesis of burning mouth syndrome (BMS) seems to be complex and many patients probably involves interactions among local, systemic, and/or psychological factors in the pathophysiologic mechanism. Although there are controversies over whether the psychological factor is a cause or a result of BMS, several studies have supported strong relationships between psychological factors and chronic pain. It has been suggested that somatic complaints from unfavorable life experiences may influence both individual personality and mood changes; however, initiation of BMS symptoms is not necessarily correlated with stressful life events despite their elevated psychological stress. If the psychological distress is not a causal factor of BMS, it seems that BMS patients may be particularly vulnerable to psychological problems, primarily depression, anxiety, and hostility due to the characteristic entities of BMS such as chronic persistent pain itself. It seems likely that both physiological and psychological factors play a role in causing, perpetuating and/or exacerbating BMS; therefore, both two components of the patient's symptoms must be addressed. The acceptance of psychological factors by the patient is often an important element of BMS, management. The evaluation of psychological and emotional status of BMS patient enables clinicians to recognize prolonged negative and subclinical factors which can complicate the management of pain or indirectly perpetuate other physical factors. This evaluation improves the doctor-patient relationships, motivation, and compliance through a correct understanding of the clinical problem. Appropriate emotional and psychological evaluation may be required prior to developing a treatment plan in order to gain the successful treatment outcome.

**Key Words:** Burning mouth syndrome; Chronic pain; Psychological factor

## INTRODUCTION

Burning mouth syndrome (BMS) has been defined as a burning pain in the tongue or oral mucous membranes, usually without accompanying clinical and laboratory findings.<sup>1,2)</sup> It has variously been termed as glossodynia, glossopyrosis, stomatodynia, or oral dysesthesia. Its symptoms usually include oral burning sensation, dry mouth, altered taste perception, irritability, changes in diet, and lowering

of the quality of life.<sup>3-5)</sup> The tongue is most commonly affected, principally the anterior two-thirds and tip on the dorsum and at the anterolateral margins. The anterior hard palate, mucosal aspect of the lip, and alveolar mucosa can also be affected, while sites such as the buccal mucosa and mouth floor are rarely involved.<sup>6)</sup> BMS is a chronic pain syndrome that mainly affects middle-aged/old women with hormonal changes or psychological disorders. This condition is probably of multifactorial origin, often idiopathic,

and its etiopathogenesis remains largely obscure. There is no consensus on the pathology, diagnosis, classification, and definitive cure of BMS.

It has been suggested that physiological factors (local and systemic factors), psychological factors, and neuropathic background representing sensory or chemosensory dysfunctions, taste change, multi-level abnormality in the processing of somatosensory information are etiologic factors of BMS.<sup>7)</sup> It seems likely that both physiological and psychological factors play a role in causing, perpetuating and/or exacerbating BMS, but the interaction between these and the relative significance of each remain largely speculative.<sup>2)</sup> Among these factors, psychological factor has been reported as a common issue for BMS. The objective of this paper is to review the psychological aspects of BMS.

## CONSIDERATION OF PSYCHOLOGICAL ASPECT IN BMS PATIENTS

### 1. Psychosocial Profiles of BMS Patients

A psychological explanation for BMS was forwarded over 80 years ago by Engman. Since that time, there have been a variety of reports concerning the relationship between BMS and psychological issues.<sup>1,8-12)</sup> There is an accumulating body of evidence that BMS patients differ from the general population in their psychopathologic profile.<sup>12-14)</sup> Pokupec-Gruden et al.<sup>13)</sup> verified in a case-controlled study that anxiety and depression are most common in patients with BMS. Amenábar et al.<sup>14)</sup> also found higher scores of anxiety and salivary cortisol levels in patients with BMS than in control subjects.

According to these studies, psychological abnormalities such as personality disorders, emotional instability, socially isolated, introverted, low self-esteem, prone to worry, nervous and tense, neuroticism, vulnerability, negative affect, lower life satisfaction, excessive concern about health, too many sad thoughts, obsession-compulsion, personal sensitivity, and psychoticism are associated with BMS. In particular, the level of anxiety, depression, and symptoms of somatization, and frequency of adverse life events in patients with BMS were higher than those of the control group.<sup>15)</sup>

### 2. Psychological Association with BMS Subtypes

It has been suggested that patients with BMS may be

classified into three types according to the clinical oral pain pattern.<sup>16)</sup> Type 1 BMS is characterized by a pain-free waking, with burning sensation developing in the late morning, gradually increasing in severity during the day, and reaching its peak intensity by evening. This type affects approximately 35% of patients and is linked to systemic disorders such as nutritional deficiency, diabetes mellitus, etc. Type 2 consists of continuous symptoms throughout the day. Patients find it difficult to get to sleep and this type occurs in about 55% of patients. Type 3 BMS is characterized by intermittent symptoms with pain-free periods during the day. Frequently, these patients constitute 10% of total patients and show allergic reaction.<sup>16,17)</sup>

Especially, type 2 BMS which accounts for more than half of all diagnosed BMS is usually associated with psychological disorders and patients with type 2 tend to be most resistant to therapy.<sup>18)</sup>

### 3. Severity and Duration of BMS Symptoms

A psychological component in BMS patients has been continuously suggested in numerous studies. For example, there are alterations in personality traits and mood changes consist of different grades of anxiety and depression, decreased aptitude to socialization, dizziness, psychasthenia, excessive concern about health, too many sad thoughts, and reluctance to take the initiative.<sup>1,4,8)</sup>

Al Quran<sup>19)</sup> measured 5 major domains of personality, namely neuroticism, extraversion, openness, agreeableness, and conscientiousness in BMS patients. BMS patients have recorded significantly high scores in neuroticism and all its facets, which include anxiety, angry hostility, depression, self-consciousness, impulsiveness and vulnerability. Neuroticism is the only personality dimension that is significantly correlated to severity of burning sensation, so they can be indicators for the severity of BMS symptoms.<sup>19)</sup> This result is in line with the findings of Grushka et al.<sup>20)</sup> who compared the pain experience and the personality profile of BMS patients. They also found that BMS patients scored higher at personality characteristic scales as the pain increases.

These psychological disorders seem to be independent of symptom intensity, but appear to be mostly related to the prolonged period of pain and a long history of unsuccessful

treatment.<sup>8,17)</sup> Mood changes consist of different grades of anxiety and depression, which often result in an extremely poor quality of life.<sup>17)</sup>

#### 4. Cancerphobia

Patients with BMS are 2.7 times more likely to display a cancerphobia than controls.<sup>21)</sup> Cancerphobia is present in 20%-30% of BMS patients.<sup>22)</sup> The BMS patients may be concerned that the symptoms are caused by oral or tongue cancer, although the patient rarely shares this concern spontaneously with the physician.

BMS patients associated with hypochondria and other phobias represent a poor prognosis. In particular, these patients may experience higher levels of pain, anxiety, and depression.<sup>23)</sup> Reassurance that oral cancer is not present should be addressed clearly and repeatedly. In some cases, reassurance alone was often successful in alleviating the symptoms. Repeated reassurance and direct questioning of their fears are important, and occasionally clinician has resorted to medication to break the vicious cycle.<sup>24)</sup>

#### 5. Adverse Life Events

Some patients complain of BMS symptoms after the occurrence of the adverse life events; death of a close relative, poor adaptation to school and/or work, family or marital strife, financial problems, cancer diagnosis, etc. In some cases dental procedures may be the adverse experiences under certain conditions.

According to Lamey et al.<sup>21)</sup> people who experience adverse life experiences may become vulnerable to developing BMS in later life. Yue et al.<sup>25)</sup> evaluated personality, psychopathological profile and existence of recent life events in BMS patients. The scores of emotional factors and negative life events in BMS patients were higher than those of the control group significantly. They concluded that BMS might be a series of psychological disorder and somatic discomfort caused by stresses of social life events on the people with special personality.<sup>25)</sup> Hakeberg et al.<sup>26)</sup> also suggested that the debut of the BMS was then preceded by an acutely stressful event. A process of somatization following a very stressful life event is likely to leave the patient more vulnerable than before.<sup>23)</sup> There can be a considerable time lag between the triggering event and onset of the BMS

condition.<sup>21)</sup>

Bogetto et al.<sup>9)</sup> studied psychiatric comorbidity in patients with BMS. In the relation between life events and BMS during a period of 6 months before the onset of BMS symptoms, no significant difference was found between BMS patients and the control group. They concluded the severity of life events, rather than in their number, was significantly associated with BMS. Although BMS patients are subjected to elevated psychological stress, the initiation of BMS symptoms is not necessarily correlated with stressful life events.<sup>12)</sup> However, this result is certainly not a universal finding and there is often a temporal relationship between such events and BMS symptom.

#### 6. Psychological Profile of Chronic Pain Patients

Patients with a long history of treatment for atypical odontalgia, atypical facial pain, and idiopathic facial arthromyalgia have shown different grades of psychological disorders.<sup>27)</sup> Ninety-two percents (50 of 54 patients) of orofacial dysesthesia patients presented with some form of mental disorder, while 72% (32 of 44 patients) of normal controls were mentally healthy.<sup>28)</sup>

It is noteworthy that psychological dysfunctions are common within a population of patients with a wide variety of different types of chronic pain conditions. Alterations in personality traits in BMS patients are comparable with those observed in groups of subjects with other chronic pain disorders.<sup>20)</sup>

#### 7. Causal Relationship

The possible etiologic role of psychogenic causes of the burning sensation is widely discussed in the literatures, however, it does not determined clearly yet.<sup>1,8-10)</sup> There is no significant difference between BMS patients and controls with respect to various physiological factors.<sup>11,12,26,29,30)</sup> The only significant differences were found in self-reported depression and anxiety in case control study.<sup>31)</sup> Hakeberg et al.<sup>26)</sup> proved that the appearance of the BMS was preceded by an acutely stressful event. Most of these literatures, however, were anecdotal, and only a few studies used objective psychometric methods to assess the patient's psychological status.

Bogetto et al.<sup>9)</sup> studied on the psychiatric comorbidity in the BMS patients. Although in most patients the onset of

the burning pain chronologically preceded the onset of the additional psychiatric disorders and substantial percentage of BMS patients exhibited this disorder in the absence of any other psychiatric diagnosis, a large group of BMS patients have shown a high frequency of a significant association with major depression and generalized anxiety disorder. The higher rates of comorbidity with psychiatric disorders and the significant association with adverse life events suggest that psychogenic factors are especially relevant in the development of BMS.<sup>9)</sup> Lamb et al.<sup>32)</sup> found more than half of the BMS patients manifested clear psychological problems, particularly anxiety and depressive syndromes, and anxiety was the most recalcitrant obstacle to cure. In a large percentage of BMS patients, van der Ploeg et al.<sup>30)</sup> clearly demonstrated the presence of a strong psychological component in their symptoms. In the study which evaluated the effect of cognitive therapy (CT), the intensity of BMS symptom was significantly reduced in the psychotherapy group directly after psychotherapy was completed and was further reduced in a 6-month follow-up; however, placebo group did not show any decrease in intensity of BMS. This result indicates that, in some cases, resistant BMS probably is of psychological origin.<sup>33)</sup> However, this conclusion may not be interpreted as support for a strong psychological factor in the etiology of BMS. Grushka et al.<sup>29)</sup> also suggested that personality and mood changes, especially anxiety and depression, frequently occurred in BMS, although a causal relationship between psychogenic factors and BMS had not been clearly demonstrated.

However, there are some rational arguments that do not support causal relationship between BMS and psychological factors. Anxiety and/or depression are not present when the oral symptoms first appear in many cases, but develop later. Patients often assert that they are depressed and/or anxious because of the unbearable nature of their disease. These psychological problems are also typical of many other chronic or long term diseases and it is difficult to establish the cause and effect relationship.<sup>22,34)</sup>

Carlson et al.<sup>11)</sup> investigated psychosocial profiles of BMS patients to determine whether psychological factors are related to pain reports. Although 21% (7 of 33 patients) of BMS patients clearly demonstrated psychological distress in the subscales of hostility, psychoticism, obsessive/

compulsive, anxiety, and somatization, BMS patients as a group did not report significant psychological distress and disruptions in normal activities.<sup>11)</sup> Danhauer et al.<sup>35)</sup> studied the psychological characteristics of 69 patients with either BMS or oral burning secondary to other clinical abnormalities. There were no differences between two groups with respect to pain duration, pain intensity, life interference, and levels of psychological distress. Accompanying mood and sleep disturbances and depression may be reactive and secondary to BMS or to other menopausal stresses.<sup>36)</sup>

The usefulness of tricyclic antidepressants and some benzodiazepines may be more closely related to their analgesic and anticonvulsant properties, and to the possible effect of benzodiazepines on taste-pain pathways.<sup>29)</sup> The reported success of psychotherapies in the treatment of BMS may be related more to an improvement in ability to cope with their suffering and emotional distress than to a "cure" of the disorder.<sup>29)</sup>

These two conflicting opinions could be due to experimenter expectancies when assessors were not blind to the subject's diagnostic status, inaccurate diagnosis and classification of BMS patients themselves, different psychological assessment instruments, or comparisons between group norms rather than against a clinical standard. In particular, determinations regarding levels of depression and anxiety are based more often either on mean differences between groups on self-report measures, or on a subjective psychiatric diagnosis based on a clinical interview.<sup>11)</sup>

It is noteworthy that prolonged stress such as chronic pain conditions as found in BMS patients may affect and alter the subject's psychological profile. The evidence of a causal relationship between BMS and psychological factors is difficult to prove. Some investigators asserted the important role of psychological factors such as anxiety and depressive disorders in unexplained somatic symptoms and proved the prevalence of non-specific somatoform symptoms is higher in psychologically disturbed patients than in the general population.<sup>1,37)</sup> BMS patients have poorer self-reported overall health and complain of more illnesses, gastrointestinal problems, chronic fatigue, disturbed sleep patterns, headaches and pain in other locations and are more likely to display a cancer phobia.<sup>6,16,21)</sup> An interesting proposed link is that cancerphobia, chronic fatigue and

disturbed sleep can be thought of as emotional concomitants of anxiety, while gastrointestinal disorders could be a physical concomitant of anxiety.<sup>21)</sup> The implication is that BMS may be indicative of distress that causes vulnerable individuals to experience emotional distress as pain. Studies suggest selective serotonin reuptake inhibitors (SSRIs) and amisulpride may be effective in reducing BMS symptoms, supporting the somatoform pain disorder model for BMS.<sup>1,38)</sup> However, to regard BMS as merely a somatic symptom of an underlying psychiatric disorder is inappropriate.<sup>1)</sup>

Chronic stress, post-traumatic stress, depression and chronic anxiety have been prevalent states in “functional pain disorders” which are a group of conditions such as BMS, irritable bowel syndrome, fibromyalgia and chronic fatigue syndrome. A hypothesis linking psychological and somatic aspects of so-called functional pain conditions (such as BMS) has been proposed based on aspects of the physiology and neurochemistry of anxiety and response to stress.<sup>1,21)</sup> Chronic psychosocial stress leads to a dysregulation of hypothalamic-pituitary-adrenal (HPA) axis. A decreased or modified production of some major precursors for the neuroactive steroid synthesis occurs in the skin, mucosa, and nervous systems. At menopause, the drastic fall of the other main precursor supply, the gonadal steroids, leads to a brisk alteration of the production of neuroactive steroids. This results in neurodegenerative alterations of small nerve fibers of the oral mucosa and/or some brain areas involved in oral somatic sensations. These neuropathic changes become irreversible and precipitate the burning pain, dysgeusia, and xerostomia associated with BMS, which all involve thin nerve fibers.<sup>1,39)</sup>

## 8. Management

Many pharmacological agents, administered topically or systemically, have been proposed to overcome the pain in BMS. The agents which demonstrate benefit effects on reducing BMS pain intensity in randomized, controlled trials are topical clonazepam, systemic amisulpride, tricyclic antidepressants, and alpha lipoic acid, etc.<sup>17,22,40)</sup> Antipsychotics can be applied for BMS patients with evident psychological problem. However, low doses of amitriptyline and nortriptyline owe their usefulness in BMS more to the antinociceptive properties of the tricyclic than to their antidepressant effect,

and consequently antidepressant doses are not necessary.<sup>22)</sup>

Cognitive behavioral therapy can be tried for resistant BMS patients. Cognitive behavioral therapy is an active, directive, structured, and time-limited therapy used to treat various mental disorders including depression, anxiety, phobias, temporomandibular disorder and other pain disorders and is accepted as a component of multidisciplinary management of chronic pain.<sup>40,41)</sup> It involves recognizing destructive, often irrational, patterns of thinking and reacting, then modifying or replacing these with more realistic or helpful ones. The underlying theory is based on the assumption that a person's emotion and behavior are determined by the way in which he/she structures the world.<sup>33,40)</sup> Bergdahl et al.<sup>33)</sup> found that the pain intensity of BMS was significantly reduced in the CT group directly after CT was completed and was further reduced in a 6-month follow-up. Placebo group did not show any decrease in pain intensity of BMS.

Another aspect that has to be taken into consideration in the psychological treatment of BMS is that many patients also fail to understand that the response to the treatment is obtained only after a specified minimum period of treatment. In general the patients want quick and effective solutions for their disease. In such cases, the resistance to accept psychotherapy is even greater. Thus, in order to change this situation, the group psychotherapy can be proposed. It was intended to build the confidence of the patients in health professionals. In the group therapy patients shared information about their symptoms and fear, e.g., cancer phobia. This is a simple form of therapy which helps to avoid the isolation and loneliness of the patients. When in a group they also improved their knowledge about the disease and established a fundamental change to accept any proposed treatment.<sup>42)</sup> Improvement of symptoms was reported by 70.8% (17 of 24 patients) of the BMS patients undergoing group psychotherapy, while among those who did not 40% (8 of 20 patients) had improvement of symptoms.<sup>42)</sup> The group psychotherapy may be an important alternative as an adjuvant therapeutic method in the treatment of BMS.

## CONCLUSIONS

Acceptance of the role of psychological factors in the development and progression of BMS is an important element

in patient understanding and management. Clinician must take into account the psychological factors as well as the disease entity. Several psychiatric or psychological assessment tools are thought to be useful. Mood-altering drugs, such as anxiolytics and tricyclic antidepressants, can be helpful for patients who had stronger psychogenic components. Patients who do not respond to any of the above treatments should undergo cognitive/behavior therapies by qualified psychotherapists, since they probably have, in their BMS spectrum, a strong and complex psychogenic component of the pain. The complex and multifactorial etiology of BMS makes collaboration between various different types of specialists crucial in the management of these patients.

## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

## REFERENCES

1. Abetz LM, Savage NW. Burning mouth syndrome and psychological disorders. *Aust Dent J* 2009;54:84-93.
2. Barker KE, Savage NW. Burning mouth syndrome: an update on recent findings. *Aust Dent J* 2005;50:220-223.
3. Maltzman-Tseikhin A, Moricca P, Niv D. Burning mouth syndrome: will better understanding yield better management? *Pain Pract* 2007;7:151-162.
4. López-Jornet P, Camacho-Alonso F, Lucero-Berdugo M. Quality of life in patients with burning mouth syndrome. *J Oral Pathol Med* 2008;37:389-394.
5. López-Jornet P, Camacho-Alonso F, Andujar-Mateos P, Sánchez-Siles M, Gómez-García F. Burning mouth syndrome: an update. *Med Oral Patol Oral Cir Bucal* 2010;15:e562-e568.
6. Savage NW, Boras VV, Barker K. Burning mouth syndrome: clinical presentation, diagnosis and treatment. *Australas J Dermatol* 2006;47:77-83.
7. Drage LA, Rogers RS 3rd. Burning mouth syndrome. *Dermatol Clin* 2003;21:135-145.
8. Bergdahl J, Anneroth G, Perris H. Personality characteristics of patients with resistant burning mouth syndrome. *Acta Odontol Scand* 1995;53:7-11.
9. Bogetto F, Maina G, Ferro G, Carbone M, Gandolfo S. Psychiatric comorbidity in patients with burning mouth syndrome. *Psychosom Med* 1998;60:378-385.
10. Browning S, Hislop S, Scully C, Shirlaw P. The association between burning mouth syndrome and psychosocial disorders. *Oral Surg Oral Med Oral Pathol* 1987;64:171-174.
11. Carlson CR, Miller CS, Reid KI. Psychosocial profiles of patients with burning mouth syndrome. *J Orofac Pain* 2000;14:59-64.
12. Eli I, Kleinhauz M, Baht R, Littner M. Antecedents of burning mouth syndrome (glossodynia)--recent life events vs. psychopathologic aspects. *J Dent Res* 1994;73:567-572.
13. Pokupec-Gruden JS, Cekić-Arambasin A, Gruden V. Psychogenic factors in the aetiology of stomatopyrosis. *Coll Antropol* 2000;24(Suppl 1):119-126.
14. Amenábar JM, Pawlowski J, Hilgert JB, et al. Anxiety and salivary cortisol levels in patients with burning mouth syndrome: case-control study. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2008;10:460-465.
15. Gao J, Chen L, Zhou J, Peng J. A case-control study on etiological factors involved in patients with burning mouth syndrome. *J Oral Pathol Med* 2009;38:24-28.
16. Lamey PJ. Burning mouth syndrome. *Dermatol Clin* 1996;14:339-354.
17. Scala A, Checchi L, Montevecchi M, Marini I, Giamberardino MA. Update on burning mouth syndrome: overview and patient management. *Crit Rev Oral Biol Med* 2003;14:275-291.
18. Lamey PJ, Lamb AB, Hughes A, Milligan KA, Forsyth A. Type 3 burning mouth syndrome: psychological and allergic aspects. *J Oral Pathol Med* 1994;23:216-219.
19. Al Quran FA. Psychological profile in burning mouth syndrome. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004;97:339-344.
20. Grushka M, Sessle BJ, Miller R. Pain and personality profiles in burning mouth syndrome. *Pain* 1987;28:155-167.
21. Lamey PJ, Freeman R, Eddie SA, Pankhurst C, Rees T. Vulnerability and presenting symptoms in burning mouth syndrome. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005;99:48-54.
22. Brufau-Redondo C, Martín-Brufau R, Corbalán-Velez R, de Concepción-Salesa A. Burning mouth syndrome. *Actas Dermosifiliogr* 2008;99:431-440.
23. Jerlang BB. Burning mouth syndrome (BMS) and the concept of alexithymia--a preliminary study. *J Oral Pathol Med* 1997;26:249-253.
24. Lamey PJ, Lamb AB. Prospective study of aetiological factors in burning mouth syndrome. *Br Med J (Clin Res Ed)* 1988;296:1243-1246.
25. Yue Y, Chen Q, Lin M, Li B. Psychological aspects of patients with burning mouth syndrome: an investigation of personality, psychopathological profiles and social life background stress. *Hua Xi Kou Qiang Yi Xue Za Zhi* 1999;17:36-38.
26. Hakeberg M, Hallberg LR, Berggren U. Burning mouth syndrome: experiences from the perspective of female patients. *Eur J Oral Sci* 2003;111:305-311.
27. Woda A, Pionchon P. A unified concept of idiopathic orofacial pain: clinical features. *J Orofac Pain* 1999;13:172-184; discussion 185-195.
28. Hampf G, Vikkula J, Ylipaavalniemi P, Aalberg V. Psychiatric disorders in orofacial dysaesthesia. *Int J Oral Maxillofac Surg* 1987;16:402-407.
29. Grushka M, Epstein JB, Gorsky M. Burning mouth syndrome. *Am Fam Physician* 2002;65:615-620.

30. van der Ploeg HM, van der Wal N, Eijkman MA, van der Waal I. Psychological aspects of patients with burning mouth syndrome. *Oral Surg Oral Med Oral Pathol* 1987;63:664-668.
31. Sardella A, Lodi G, Demarosi F, Uglietti D, Carrassi A. Causative or precipitating aspects of burning mouth syndrome: a case-control study. *J Oral Pathol Med* 2006;35:466-471.
32. Lamb AB, Lamey PJ, Reeve PE. Burning mouth syndrome: psychological aspects. *Br Dent J* 1988;165:256-260.
33. Bergdahl J, Anneroth G, Perris H. Cognitive therapy in the treatment of patients with resistant burning mouth syndrome: a controlled study. *J Oral Pathol Med* 1995;24:213-215.
34. Van Houdenhove B, Joostens P. Burning mouth syndrome. Successful treatment with combined psychotherapy and psychopharmacotherapy. *Gen Hosp Psychiatry* 1995;17:385-388.
35. Danhauer SC, Miller CS, Rhodus NL, Carlson CR. Impact of criteria-based diagnosis of burning mouth syndrome on treatment outcome. *J Orofac Pain* 2002;16:305-311.
36. Mott AE, Grushka M, Sessle BJ. Diagnosis and management of taste disorders and burning mouth syndrome. *Dent Clin North Am* 1993;37:33-71.
37. Hexel M, Sonneck G. Somatoform symptoms, anxiety, and depression in the context of traumatic life experiences by comparing participants with and without psychiatric diagnoses. *Psychopathology* 2002;35:303-312.
38. Maina G, Vitalucci A, Gandolfo S, Bogetto F. Comparative efficacy of SSRIs and amisulpride in burning mouth syndrome: a single-blind study. *J Clin Psychiatry* 2002;63:38-43.
39. Woda A, Dao T, Gremeau-Richard C. Steroid dysregulation and stomatodynia (burning mouth syndrome). *J Orofac Pain* 2009;23:202-210.
40. Patton LL, Siegel MA, Benoliel R, De Laat A. Management of burning mouth syndrome: systematic review and management recommendations. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;103(Suppl):S39.e1-S39.e13.
41. Eccleston C. Role of psychology in pain management. *Br J Anaesth* 2001;87:144-152.
42. Miziara ID, Filho BC, Oliveira R, Rodrigues dos Santos RM. Group psychotherapy: an additional approach to burning mouth syndrome. *J Psychosom Res* 2009;67:443-448.