

Psychosocial Profiles of Patients with Burning Mouth Syndrome

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Aims: Burning mouth syndrome (BMS) is estimated to affect 1 to 5% of the adult population, with women experiencing symptoms more frequently than men. The purpose of this study was to examine the psychosocial profiles of BMS patients to determine whether psychologic factors are related to pain reports. Based on previous literature, it was hypothesized that patients with BMS would be characterized by clinical elevations on standardized psychologic assessment instruments that included the Revised Symptom Checklist (SCL-90R) and the Multidimensional Pain Inventory (MPI). **Methods:** Thirty-three BMS patients completed the McGill Pain Questionnaire, MPI, and SCL-90R during their initial clinical evaluation session. The SCL-90R and MPI data were then summarized and presented in standardized format (T-scores) to enable meaningful comparisons with larger population samples that included both a chronic pain population and a normal non-clinical sample. **Results:** The T-score for the overall pain severity on the MPI was 40.8 (SD 12.8). For the entire BMS sample, there was no evidence for significant clinical elevations on any of the SCL-90R subscales, including depression, anxiety, and somatization. Moreover, patients reported significantly fewer disruptions in normal activities as a result of their oral burning pain than did a large sample of chronic pain patients. **Conclusion:** These findings indicate that, as a group, this sample of BMS patients did not report significant psychologic distress. There were, however, individual cases (7 of 33, or 21%) where psychometric data indicated a likelihood of psychologic distress, and further evaluation by a competent health professional would be warranted for those individuals.

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Burning mouth syndrome (BMS) is a condition involving unexplained complaints of burning pain in the oral mucosa that are associated with no recognizable or apparent clinical abnormalities.^{1,2} It is estimated to affect between 1 and 5% of the adult population, with women experiencing symptoms more frequently than men. The vast majority of women who experience this disorder are over 50 years of age and postmenopausal; occurrences below the age of 30 are rare.¹ As there are no strong data at present to implicate physiologic abnormalities in BMS,^{1,2} investigators have explored whether or not psychologic factors are related to BMS.

A psychologic explanation for BMS was forwarded over 70 years ago by Engman.³ Since that time, there have been a variety of reports concerning the relationship between BMS and psychologic issues. Several recent reviews of BMS^{1,2,4,5} have summarized these data and concluded that patients with BMS generally report psychologic distress. These conclusions are based on studies that have reported primarily greater levels of depression⁶⁻¹¹ and anxiety⁹⁻¹² in patients with BMS compared with pain-free controls. In addition to depression and anxiety, Lamey⁴ suggested that BMS patients may also represent a group of individuals who have exaggerated concerns about cancer in the head and neck region.

Two research studies,^{13,14} however, have not found psychologic factors associated with BMS. Furthermore, upon closer examination of the studies reporting psychologic distress, the conclusions regarding levels of depression and anxiety are based more often either on mean differences between BMS patients and controls on self-report measures, or on a subjective psychiatric diagnosis based on a clinical interview. Objective scores elevated above a generally recognized clinical cut-off point (greater than 2 standard deviations from a normal population mean)^{15,16} that would indicate significant psychopathology have not been routinely employed.

The purpose of this study was to examine the psychosocial profiles of BMS patients to determine whether self-reported psychologic symptoms were clinically significant and related to reports of pain. Based on a review of the literature using the Revised Symptom Checklist¹⁷ (SCL-90R), a self-report inventory of general psychiatric symptoms, it was hypothesized that BMS patients as a whole would demonstrate elevations of at least 2 standard deviations on the anxiety and depression subscale profiles. Finally, exploratory analyses were conducted to examine the relationships between pain reports and psychologic characteristics.

Methods

Subjects

Thirty-three BMS patients were recruited from the Orofacial Pain Center at the University of Kentucky. The average age of subjects was 62.84 years and 88% of the sample was female. Inclusion criteria were: (1) symptoms of diffuse, burning pain of the tongue and/or oral mucosa consistent with BMS sensory neuropathy as

described by Lamey⁴; (2) burning pain almost every day; (3) oral burning pain rated greater than 10 mm on a 100-mm visual analog scale (VAS), where "0" represented "no pain" and "100" represented "worst possible pain"; (4) selection of the descriptor "burning" from the McGill Pain Questionnaire (MPQ); (5) an intensity rating for "burning" that equaled or exceeded all other descriptors on the MPQ; (6) examination revealing normal mucosa in the region of burning; and (7) no clinical evidence for the burning. Exclusion criteria were: (1) specific etiologic evidence for the burning (eg, allergy, anemia, diabetes, fungal infection, xerostomia); (2) another acute or chronic pain condition at least as severe as the burning mouth (eg, gross caries, acute periodontal lesions, lichen planus, chronic regional pain syndrome); (3) inability to communicate or complete forms; and (4) regular use of medications that alter pain perception, inflammation, or neurotransmitter (eg, norepinephrine, serotonin) functioning. Each of the subjects was asked at the initial evaluation whether or not he or she would like to participate in the research project. The study was approved by the University of Kentucky Institutional Review Board for the Protection of Human Subjects.

Psychometric Instruments

The BMS patients completed 3 psychometric instruments, the MPQ-Short Form,¹⁸ the Multidimensional Pain Inventory (MPI),¹⁹ and the SCL-90R,¹⁷ during the initial clinical evaluation. The MPQ is a 15-item scale that includes a sensory pain rating scale comprised of 11 verbal descriptors and an affective pain rating scale that includes 4 verbal descriptors. The 11 items on the sensory scale were each rated on a scale of 0 to 3 ("0" represented none and "3" represented severe sensory quality) and summed for the sensory pain score. Each item on the 4-item affective scale was rated on the same scale, and then the items were summed for the affective pain score. The MPQ also has a 100-mm VAS for rating overall pain severity. The MPI is a comprehensive self-report instrument made up of 61 items that yield psychosocial indices (eg, pain severity, interference, life control, affective distress, and support) and behavioral indices (eg, punishing responses, solicitous responses, distracting responses, household chores, outdoor work, activities away from home, social activities, and general activity level) of the influence of current pain experience. Test-retest reliabilities as reported by Kerns et al¹⁹ of the individual scale scores range from $r = 0.68$ to 0.86 ;

Table 1 Mean Self-Ratings of BMS Subjects for Multidimensional Pain Inventory Domains

Category	Mean self-ratings			
	T-scores*	SD	Raw score	SD
Pain severity	40.8	12.8	3.5	1.3
Interference	26.9	14.0	2.2	1.6
Life control	52.2	8.3	3.5	1.3
Affective distress	43.9	11.2	3.0	1.5
Support	42.7	13.9	3.5	1.9
Punishing responses	49.4	10.3	1.8	1.6
Solicitous responses	47.2	9.3	3.1	1.5
Distracting responses	49.9	10.4	2.4	1.5
Household chores	55.2	10.1	3.9	1.7
Outdoor work	50.8	9.8	1.2	1.2
Activities away from home	56.2	12.1	2.8	1.4
Social activities	51.6	10.6	2.2	1.3
General activity level	54.4	10.4	2.6	1.0

*T-scores are based on a large sample of other pain patients and not on normal subjects.

coefficient alphas or internal consistencies range from $r = 0.73$ to 0.90 . The SCL-90R is a 90-item self-report measure that provides a general assessment of psychiatric symptoms, with 9 scales that reflect a broad range of psychopathology. The scales include somatization, obsession/compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychotism, and an overall general symptom index. Test-retest reliabilities of the individual SCL-90R scale scores with non-patient samples range from $r = 0.78$ to 0.90 ; coefficient alphas or internal consistencies range from $r = 0.77$ to 0.90 .

Procedure

The BMS patients were initially seen by a dentist with advanced training in oral medicine, who conducted the clinical exam. Following the completion of this comprehensive oral examination, which determined the BMS diagnosis according to the inclusion and exclusion criteria presented above, patients were informed of the purpose of the project and completed a consent form. Patients were given the psychometric questionnaires to complete and return to the investigators. Patients were recruited sequentially in the clinic, and all but 1 patient who was approached to participate completed the study.

All subjects initially recruited into the study returned the forms for analyses. The psychometric data were scored and standardized with a normal, non-clinical sample ($n = 974$) from the general population for the SCL-90R¹⁷ and from a general

pain population presenting for treatment at a pain center ($n = 300$) for the MPI¹⁹ prior to performing quantitative analyses. The standardized scores were expressed as T-scores where the mean equaled 50 and the standard deviation equaled 10. Transformation to T-scores enabled the presentation of standardized scores without the use of negative numbers. The standardization samples are widely accepted within the empirical literature and represent a prudent comparison point upon which to evaluate the BMS sample. Correlational analyses to explore potential relationships among psychologic variables and sensory/affective pain reports were conducted with Pearson's correlation coefficient, with the alpha level set at $P < 0.05$.

Results

Self-Reports of Pain

The average sensory pain rating obtained by summing the values obtained from each of the 11 items on the MPQ sensory subscale for BMS patients was $X = 5.0$ (SD 4.6). The BMS patients obtained a mean index for affective ratings on the MPQ of $X = 3.0$ (SD 3.5). The mean VAS pain severity rating on the MPQ was 54.38 mm (SD 22.1). Average T-scores for the MPI scales were also computed; a normative sample of pain patients was used as the reference point to determine the T-scores. The values and standard deviations reported in Table 1 represent the T-scores of the present BMS sample, as well as the average

Table 2 Burning Mouth Syndrome Subjects' Self-Reports of Psychiatric Symptoms

Scale	T-score	SD	Raw score	SD
Somatization	56.0	11.1	0.7	0.6
Obsessive-compulsive	56.0	10.7	0.7	0.7
Interpersonal sensitivity	53.6	10.8	0.5	0.6
Depression	58.2	7.8	0.8	0.5
Anxiety	55.3	10.9	0.6	0.6
Hostility	53.4	10.9	0.5	0.6
Phobic anxiety	50.3	8.8	0.2	0.3
Paranoia	50.7	9.4	0.4	0.5
Psychoticism	55.2	10.3	0.3	0.4
Global Severity Index	56.9	10.6	0.6	0.5

Table 3 Relationship of Pain Ratings and Psychologic Characteristics

Psychologic characteristic	Pain rating	
	Sensory pain	Affective pain
Somatization	0.20	0.39*
Obsessive-compulsive	0.04	0.17
Interpersonal sensitivity	0.14	0.25
Depression	-0.01	0.32
Anxiety	0.21	0.31
Hostility	0.18	0.36*
Phobia	0.23	0.30
Paranoia	0.22	0.34
Psychoticism	0.13	0.29
Global Severity Index	0.11	0.38*

*Pearson's correlation coefficient; $P < 0.05$.

raw scores for the MPI. The T-score for overall pain severity on the MPI was 40.8 (SD 12.8). The most notable characteristic of the BMS sample is the minimal degree of interference from the pain reported by the BMS patients, as compared to chronic pain patients in general, as demonstrated by the mean T-score of the BMS sample being more than 2 standard deviations lower. All of the other scale scores are within 1 standard deviation of the scores obtained from a normative pain population.

Psychologic Characteristics of BMS Sample

Each of the patients' SCL-90R raw scores was converted to standardized T-scores through the use of non-patient adult norms. The average T-scores for

the BMS sample are presented in Table 2, along with raw scores and standard deviations. None of the average scale T-scores for the SCL-90R were greater than 2 standard deviations above the mean for a normal population. However, 7 of the 33 subjects had individual scale scores above this standardized cut-off point. There were no consistent patterns of scale elevations in this small group of patients; however, 3 individuals had their highest scale elevations for hostility, and 1 individual each had his or her highest elevation on the psychoticism, obsessive/compulsive, anxiety, and somatization subscales. If decision criteria were lowered to a T-score of 63 as described by Derogatis¹⁷ to broaden the inclusion base, 10 additional subjects would be included, with 3 individuals having elevations on depression; 2 individuals each having elevations on phobic anxiety, obsessive-compulsive, and hostility; and 1 individual having an elevation on anxiety.

Relationship Between Pain and Psychologic Characteristics

Correlational analyses were performed to evaluate the overall relationships between pain reports and psychologic characteristics. We opted not to adjust the alpha level for the family-wise error rate because the analyses were exploratory, the sample size was low, and we were interested in determining whether or not a general pattern of results emerged in these preliminary analyses. It was found that sensory pain reports were not related to any psychologic symptom cluster from the SCL-90R ($P > 0.10$). Affective pain was related to somatization and hostility, and to global severity ($P < 0.05$). These results are presented in Table 3.

Discussion

Based on the group norms of the present sample, patients with BMS did not as a whole demonstrate symptoms/signs of psychological distress as defined by elevations greater than 2 standard deviations from the mean of a normal, pain-free population.^{15,16} We believe this cut-off point is very conservative; however, it is possible that more stringent decision criteria may be necessary when applying the SCL-90R to a BMS population to identify those individuals for whom psychological dysfunction is significant. In fact, when the decision criteria were lowered to 63T, as suggested by Derogatis¹⁷ based on his clinical samples, 50% of the sample reported elevations on 1 or more scales. Since a number of previous studies have documented the presence of psychopathology in the BMS population, alterations in the cut-off criteria for the SCL-90R may enable the identification of those individuals for whom structured clinical interviews to identify significant psychological dysfunction would be appropriate.

The normal comparison SCL-90R sample represents the published norms for this scale where the average age is 46 years. Since this is lower than the average age of the BMS sample, caution is necessary when interpreting the present findings for the patients with BMS. It could be argued that the results of the study merely represent a comparison with a younger cohort, but that interpretation makes the lack of any significant psychological findings all the more intriguing and strengthens our interpretation that psychological disturbance does not necessarily accompany BMS. Taken as a whole, the group data from the patients with BMS do not provide support for a particular psychological component to the presenting complaints. In fact, among those reporting significant numbers of psychological symptoms, there did not appear to be consistent patterns in symptom clusters. There are circumstances, however, in which individual response patterns on SCL-90R scores in clinical data sets, especially when there are individual scales with elevations over 70T, do warrant closer evaluation by professionals trained in the diagnosis of psychological dysfunction.

The present results contrast with several previous studies that have reported a high incidence of psychological dysfunction in BMS patients.^{2,3,5,12} This 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. Additionally, future research combining structured diagnostic interviews with the use of the SCL-90R may reveal that lower T-score cut-off points are necessary to identify clinically meaningful psychopathology in this group of patients.

The current data set needs to be interpreted cautiously for several reasons. First, the relatively small sample size raises the possibility that our data may not characterize well the population of BMS patients that are seen in other clinics. It also is possible that when care is taken to diagnose BMS according to the criteria that excludes other sources for the oral burning, the frequency of psychological distress is reduced. Lamey and Lamb¹⁰ have suggested that there are different subtypes of BMS patients, such that the varying numbers of patients with BMS subtypes from one setting to another may also be a reason why differing psychological findings are reported in the literature.

The present data illuminate several issues related to the improvement of our understanding of BMS patients from a psychological perspective. One is the development of a valid and reliable common diagnostic system for BMS itself. In particular, symptoms of oral burning due to identifiable causes should be differentiated from true BMS. We attempted to address this issue by establishing stringent inclusion and exclusion criteria that included both an oral medicine-oriented clinical exam and self-report measures of pain symptoms. Another important issue involves the difficulty in making an accurate diagnosis of BMS in light of the relative infrequency with which clinicians are presented with the disorder. Furthermore, the limited numbers of BMS patients in any single clinical catchment area pose a threat to sufficient statistical power to evaluate the role of psychological characteristics.

A meaningful question raised by these findings involves to what extent other variables, such as sensitivity to painful stimuli, may be playing a role in symptom presentation. While Grushka et al²⁰ did not find significant changes in most sensory discrimination features that mark BMS patients from other population groups, other researchers have noted differences.²¹ The symptom presentation and lack of identifiable oral pathoses for BMS point to the possibility that central nervous system factors play a role in the development of the disorder for some of these patients. Further examination of the potential contributions of central mechanisms in BMS may be important for a subgroup of these patients.

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