The relationship between the clinical features of idiopathic burning mouth syndrome and self-perceived quality of life

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Abstract: In this descriptive study, we investigated the relationship between the clinical characteristics of idiopathic burning mouth syndrome (iBMS) and the quality of life. Eighteen iBMS patients were interviewed about their experience with pain, oral-associated complaints, cognitive status, and self-perceived quality of life using the French versions of the Hospital Anxiety and Depression Scale (HADS) and the Global Oral Health Assessment Index (GOHAI). The Spearman coefficient was used to analyze correlations. The level of significance was fixed at \( P < 0.05 \). The majority of patients described the association of oral burning sensations with other oral complaints, including dry mouth (77.8%), tactile abnormalities (66.7%), thermal abnormalities (44.5%), and taste disturbances (38.9%). HAD-anxiety scores were higher than 10 in 38.8% of iBMS patients and HAD-depression scores were higher than 10 in 33.3% of patients. A significant correlation was found between the number of associated complaints and HAD-depression scores. The mean GOHAI-add score was 37.9 ± 9.6 (mean ± SD), and 94.5% of iBMS patients had a score lower than 50. GOHAI-add scores strongly correlated with pain intensity, which was calculated using a visual analog scale and duration of pain. Our findings indicate a strong correlation between iBMS-related pain and self-perceived oral health-related quality of life. In addition, a correlation was observed between iBMS-associated oral complaints and cognitive status. (J Oral Sci 58, 475-481, 2016)

Keywords: idiopathic burning mouth syndrome; self-perceived quality of life; anxiety; depression.

Introduction

Idiopathic burning mouth syndrome (iBMS) is a chronic, painful condition of the oral cavity, defined by the International Association for the Study of Pain as an independent nosological entity characterized by “unremitting oral burning or similar pain in the absence of detectable oral mucosa changes” (1). It affects only 0.5% of the general population (2,3) but its prevalence is higher in females and increases with age—post-menopausal women are the most affected group (up to 12% of cases) (4).

The main symptom of iBMS is a burning sensation of the oral mucosa, but other unpleasant dysesthesias may also be reported such as tingling or itching (5). Pain is experienced mainly on the lingual and lip surfaces and can last between 4 and 6 months and up to several years. Pain intensity ranges from moderate to severe (6). Thermal, tactile, and gustatory sensory disturbances and abnormalities in saliva production can also occur (6). Extra-oral painful sensations are also highly prevalent in iBMS patients, including ocular burning, tension headaches, abdominal pain, and back aches (7,8). A large number of iBMS patients also suffer from other complaints such as gastro-intestinal disorders (7), poor sleep quality (9,10), chronic fatigue (7,11), and psychological distress (12).
Many drug treatments including antidepressants, dietary supplements, hormone-replacement therapy, and psychological support have been proposed, but the management of iBMS remains unsatisfactory (13,14).

The prolonged pain, comorbidities, and unsuccessful treatments associated with iBMS can affect one’s mood (11,15-17), induce or reinforce psychiatric disorders such as anxiety, depression, and cancerophobia (4,7,18-20), and impair one’s quality of life (10,11,21-23). It is important to determine how the oral symptoms of iBMS impact the daily life of patients. The purpose of the present study was to determine the relationship between oral complaints and quality of life in patients with iBMS.

Materials and Methods

The study was approved by the Dental Board of the Groupe Hospitalier Pitié-Salpêtrière (GHPS, Paris, France; Approval #024-2008). In accordance with the Declaration of Helsinki, all patients agreed to participate in the study and gave written consent. Patient anonymity was preserved throughout the course of the study. In application of the French law of 6 January 1978 relative to information technology, the study has been declared to the national data protection agency under the number 1970351 v 0.

Participants

The study group was composed of 18 subjects (17 females and 1 male) with an age of 64.2 ± 11.5 years (mean ± SD). Participants presented at the dental and maxillofacial department of the GHPS with persistent pain in the oral mucosa. The painful sensation was sometimes associated with xerostomia, tactile, thermal, and/or gustatory disturbances (Table 1). No alterations of the oral mucosa or any local or systemic diseases were apparent. Only iBMS patients were included in the study after anamnesis, clinical, and laboratory examination (6). Inclusion criteria were: symptoms of pain in the tongue and/or oral mucosa associated or not associated with subjective oral dryness and loss or alteration of taste perception; daily pain perception; pain present for at least 3 months; normal oral mucosa; absence of systemic disorders or laboratory alterations known to be associated with oro-facial pain. The following parameters were analyzed to exclude secondary BMS: vitamins B6, B9, B12; ferritin; thyroid stimulating hormone, glucose, and microbes (Candida spp. and Helicobacter pylori). Allergies were tested only when clinically suspected and were performed using standard cutaneous patch tests according to the European Environmental and Contact Dermatitis Research Group (24) with additional tests including metals (mercury, gold, palladium, and platinum), acrylic resin components, and several oral hygiene products.

Exclusion criteria were as follows: under 18 and above 80 years of age; local and regional causes for the burning such as alterations of the oral mucosa; traumatic prosthesis; hyposalivation; local pathology possibly associated with oral pain (herpes, lichen planus, allergic stomatitis, mucitis); history of systemic diseases possibly associated with burning pain (e.g., diabetes, anemia, cerebrovascular diseases, multiple sclerosis, malignancies, Sjögren syndrome, lupus, and Lyme disease); nutritional deficiencies (vitamins B, iron); allergies to certain foods or dental materials; gastro-esophageal reflux disorder; use of medications known to be associated with oral burning and/or alteration of taste or sensation such as angiotensin-converting-enzyme inhibitors and diuretics, anti-vascular endothelial growth factor, and neuroleptic; other trigeminal pain; temporo-mandibular joint pain; trigeminal neuralgias; cognitive, linguistic and/or communication impairment; inability to understand how to complete the Global Oral Health Assessment Index (GOHAI) and Hospital Anxiety and Depression Scale (HADS); involvement in another biomedical research project; no social insurance.

Oral health-related quality of life and cognitive conditions

Included patients were invited to fill out questionnaires focusing on oral complaints (dry mouth, tactile, thermal, and gustatory impairments), the onset of BMS, pain locations, pain intensity using a Visual Analogic Scale (VAS), and French versions of HADS and GOHAI.

The VAS has already been used in numerous BMS studies to evaluate the intensity of pain (5,11,17,20). In the present study, pain intensity was evaluated on a long-term basis as previously described (5). Patients were given a charting log with a printed 0 to 10 VAS and asked to fill in the VAS each hour for 7 days, starting upon awakening and finishing when they went to sleep. A score of 0 was defined as the absence of pain and 10 the maximal imaginable pain. VAS scores were then collected and the examiner calculated the scores and transferred them to a spreadsheet for data analysis. Mean VAS scores represent the average VAS scores for 7 days.

The HADS is a 14-item self-assessment scale designed to evaluate emotional stress induced by chronic pain (25) in non-psychiatric populations. HAD-A assessed anxiety and HAD-D evaluated depression. Scores of greater than 10 were indicative of anxiety or depression, scores of 7 or less were indicative of no significant anxiety and depression, and scores of 8 to 10 indicated borderline anxiety.
or depression. The HADS seems to be available for the evaluation of psychological interventions in patients with physical illness in a brief and simple manner (26).

The GOHAI is a questionnaire about the impact of oral health on quality of life. It includes 12 items evaluating three dimensions of oral health with respect to quality of life: 1) functional field (eating, speaking, and swallowing); 2) psychological field (appearance, social relationship); 3) pain or discomfort concerning gums or teeth. Each item has a score ranging from 1 to 5. The GOHAI-add score corresponds to the sum of the scores and ranges from 12 to 60 (20 for functional field, 25 for psychological field, and 15 for comfort/pain field) (27). According to Atchison and Dolan (28), a score higher than 57 is high and indicates a satisfactory oral quality of life. A score from 51 to 56 is average and a score of 50 or less is low, reflecting a poor oral quality of life.

Statistical analyses
Data were collected and analyzed using SPSS software version 11.5 (SPSS, Chicago, IL, USA). Medians, means, and standard errors were calculated. GOHAI and HADS scores were compared to test for associated oral complaints using non-parametric tests (Mann-Whitney test and Kruskall-Wallis test). Correlations were analyzed to explore the relationship between oral complaints, cognitive conditions, and oral health-related quality of life using the Spearman correlation test. The level of significance was fixed at $P = 0.05$.

Results
The duration of the symptoms was 44.3 ± 31.8 months (mean ± SD) (ranging from 3 to 96 months). The median duration of painful sensation was 36 months (Q1 = 19.5; Q3 = 72). Pain intensity ranged between 1.4 and 8.3. Mean scores for pain intensity were 3.6 ± 2.4. A significant correlation was observed between the mean VAS scores and duration of pain ($r = 0.404, P < 0.05$). Only 5.5% of iBMS patients had oral burning sensations alone; the majority of patients had oral burning sensations associated with other oral complaints (Table 1). These included dry mouth (77.7%), tactile abnormalities (66.6%), thermal abnormalities (44.4%) and taste disturbance (38.9%). The median number of associated complaints was 2 (Q1 = 2, Q3 = 3). Burning sensation was felt on the dorsum of the tongue in 83.3% of iBMS patients. It also affected the tip of the tongue in 55% of iBMS patients and the buccal mucosa in half of the patients (Table 1).

HADS
The mean HAD-A score was 10 ± 3.2 (HAD-A median = 10; Q1 = 8; Q3 = 12.5) and the mean HAD-D score was 6.9 ± 4.1 (HAD-D median = 5.5; Q1 = 4; Q3 = 11). As shown in Fig. 1, 38.8% of iBMS patients had a HAD-A score higher than 10 and 33.3% of patients had a HAD-D score higher than 10. No significant differences were observed in HAD scores for xerostomia, tactile, and thermal disturbances or for the different locations of pain (Table 2). HAD-D scores were significantly higher in iBMS patients with taste disturbance ($n = 7$; mean ± SD = 10.5 ± 2.7) compared with iBMS patients with no taste disturbance ($n = 11$; mean ± SD = 4.6 ± 3.0) (Table 2). A significant correlation was also found between the number of associated complaints and HAD-D scores ($r = 0.501, P < 0.05$). No significant correlations were found between the following: duration of the pain and HAD-A scores; duration of the pain and HAD-D scores; mean VAS score and mean HAD-A score; mean VAS score and mean HAD-D score; and the number of associated complaints and HAD-A scores.

### Table 1 Characteristics of the pain

<table>
<thead>
<tr>
<th>Oral complaints</th>
<th>Frequency n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral burning sensation</td>
<td>18 (100%)</td>
</tr>
<tr>
<td>Xerostomia</td>
<td>14 (77.7%)</td>
</tr>
<tr>
<td>Tactile</td>
<td>12 (66.6%)</td>
</tr>
<tr>
<td>Thermal</td>
<td>8 (44.4%)</td>
</tr>
<tr>
<td>Taste</td>
<td>7 (38.8%)</td>
</tr>
<tr>
<td>Pain location</td>
<td></td>
</tr>
<tr>
<td>Tongue (dorsum)</td>
<td>15 (83.3%)</td>
</tr>
<tr>
<td>Tongue Tip</td>
<td>10 (55.5%)</td>
</tr>
<tr>
<td>Buccal mucosa</td>
<td>9 (50%)</td>
</tr>
<tr>
<td>Hard palate</td>
<td>7 (38.8%)</td>
</tr>
<tr>
<td>Mucosal aspect of the lips</td>
<td>6 (33.3%)</td>
</tr>
<tr>
<td>Cutaneous portion of the lips</td>
<td>4 (22.2%)</td>
</tr>
</tbody>
</table>

**Note**: Oral complaints associated with burning sensation and pain location.

**Fig. 1** Frequency of HADS scores for anxiety and depression.
The mean GOHAI-add score was 37.9 ± 9.6 (median = 38; Q1 = 31; Q3 = 43.5). A total of 94.5% of patients had a score lower than 50 (Fig. 2a). Significant correlations were observed between mean VAS score and GOHAI-add score ($r = -0.631$, $P < 0.001$), and between duration of pain and GOHAI-add score ($r = -0.414$, $P < 0.05$). No significant correlation was observed between the number of associated oral complaints and the GOHAI-add scores. However, iBMS patients suffering from taste abnormalities had lower GOHAI-add scores ($n = 7$, mean ± SD = 31.3 ± 8.5) than iBMS patients without taste abnormalities ($n = 11$, mean ± SD = 40.4 ± 5.6, $P < 0.05$; Mann-Whitney) (Table 3). The mean GOHAI-add scores were not significantly different between groups concerned by other oral complaints and by locations of BMS (Table 3).

Significant correlations were observed between the following: mean VAS and functional field scores ($r = -0.659$, $P < 0.001$); mean VAS and psychological fields scores ($r = -0.411$, $P < 0.05$); and duration of the pain and functional field scores ($r = -0.532$, $P < 0.05$). A significant difference was also observed in functional field scores between patients with oral burning sensation and taste disorder ($n = 7$, mean ± SD = 10.1 ± 4.6) and patients without taste disorder ($n = 11$, mean ± SD = 15.9 ± 3.1, $P < 0.05$; Mann-Whitney). No correlation was found between different fields of the GOHAI questionnaire and the number of associated complaints.

### Table 2

<table>
<thead>
<tr>
<th>Associated symptoms</th>
<th>HAD-A scores</th>
<th></th>
<th>HAD-D scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>$P$</td>
<td>Yes</td>
</tr>
<tr>
<td>Xerostomia</td>
<td>9.6 ± 3.4</td>
<td>11.5 ± 2.6</td>
<td>NS</td>
<td>7.2 ± 4.2</td>
</tr>
<tr>
<td>Tactile</td>
<td>9.7 ± 3.4</td>
<td>10.6 ± 3.2</td>
<td>NS</td>
<td>7.8 ± 4.3</td>
</tr>
<tr>
<td>Thermal</td>
<td>9.5 ± 3.4</td>
<td>10.4 ± 3.3</td>
<td>NS</td>
<td>6.8 ± 3.9</td>
</tr>
<tr>
<td>Taste</td>
<td>11.7 ± 2.6</td>
<td>8.9 ± 3.2</td>
<td>NS</td>
<td>10.5 ± 2.7</td>
</tr>
</tbody>
</table>

### Table 3

<table>
<thead>
<tr>
<th>Associated symptoms</th>
<th>HAD-A scores</th>
<th></th>
<th>HAD-D scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>$P$</td>
<td>Yes</td>
</tr>
<tr>
<td>Xerostomia</td>
<td>40.0 ± 9.3</td>
<td>30.8 ± 7.7</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Tactile</td>
<td>37.8 ± 10.4</td>
<td>38.1 ± 8.8</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Thermal</td>
<td>37.2 ± 9.1</td>
<td>36.1 ± 7.8</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Taste</td>
<td>31.3 ± 8.5</td>
<td>40.4 ± 5.6</td>
<td>$P &lt; 0.05$</td>
<td></td>
</tr>
</tbody>
</table>

**Mann-Whitney test, NS: not significant.**

**Fig. 2** GOHAI-add scores. (a) Frequency of mean GOHAI-add scores. (b) Functional, psychosocial, and comfort field scores obtained from the GOHAI questionnaire.
Discussion
The aim of the present study was to determine the relationship between oral symptoms of iBMS and the well-being of patients. It is difficult to match experimental and control groups using oral characteristics; therefore we used a descriptive approach in a sample of iBMS patients. We identified anxiety, depression, sad thoughts, and poor oral health-related quality of life in iBMS patients. In addition, we demonstrated that oral comorbidities such as taste abnormalities may have an impact on the psychological status and oral health-related quality of life in iBMS patients.

Psychological status
Almost one-third of patients with iBMS included in the present study had HAD-A and HAD-D scores higher than 10, indicative of anxiety and depression. Specific personality traits have previously been described for BMS patients, including anxiety, sad thoughts, concerns about health, and cancerophobia (11,17). iBMS patients feel more anxious and depressed than healthy controls (7,9,10,29-31) and have a greater prevalence of personality disorders than healthy subjects (32).

The relationship between pain experience and psychiatric status is complex. Schiavone et al. (30) observed that pain increases along with anxiety and depression but not with disease duration. They proposed a model in which pain was a somatic feature of depression in people with anxiety and who are hostile with somatization tendencies. However, the present study failed to demonstrate a statistical correlation between the characteristics of physical pain and the psychological status. Our findings suggest that anxiety and depression are independent of the intensity of BMS (4,31). Therefore, it remains unclear whether psychiatric disorders are a cause or consequence of iBMS.

Cognitive therapy has been found to reduce the intensity of pain in some BMS patients (11). Hakeberg et al. (33) reported stressful adverse life events or periods of increased anxiety before the onset of the burning sensation. Moreover, according to de Souza et al. (31), the majority of iBMS patients present with psychiatric disorders before iBMS symptoms occur. In contrast, the moderate to severe intensity of chronic painful sensations experienced in iBMS may be a precipitating factor for psychiatric disorders. Chronic pain such as iBMS may influence one’s mood or personality (15,17). This hypothesis may be relevant when BMS precedes the onset of psychiatric disorders (31). In the presence of chronic affections such as iBMS, patients with higher sensitivity to anxiety may have a more negative emotional response to pain (34), leading to a form of demoralization.

Interestingly, we found that HAD-D scores were affected by the number of associated oral complaints. HAD-D scores increased in patients with self-perceived taste disturbance, suggesting that the cognitive status of iBMS patients may be related to oral-associated complaints. Chemosensory disorders, such as taste and/or smell alterations, reduce the enjoyment of food, cause problems in interpersonal relationships, increase a patient’s vulnerability, and induce a depressed mood (35). Self-perceived taste disturbances are strongly associated with anxiety and depression (36). We suggest that taste impairment affects the hedonistic aspect of oral function and could influence the subjective responses to negative emotions. The cumulative experience of pain and associated oral sensory symptoms could affect the vulnerability of iBMS patients.

Oral health-related quality of life
BMS patients describe poorer overall health than healthy subjects (7). Variable degrees of disability have previously been described in iBMS patients, ranging from sustaining an acceptable quality of life to giving up normal life activities and withdrawal from social activities (17). How the chronic oral burning sensation of BMS affects oral health-related quality of life has been explored using short (14 items) or long (49 items) versions of the Oral Health Impact Profile Questionnaire (OHIP) (10,21-23). iBMS subjects had lower quality of life scores than healthy controls (21,23). However, the GOHAI questionnaire seems to be more appropriate when focusing on subjective oral health (34) but has never been used to analyze iBMS patients. The existing 49-item version of the OHIP is challenging to complete depending on the subject’s ability to concentrate. The shorter 14-item version (OHIP-14) is a simpler way to measure dysfunction, discomfort, and disability attributed to oral conditions.

The GOHAI is based on a patient-centered definition of oral health reporting self-perceived oral functional problems and psychosocial impacts associated with oral diseases (37). Taking into account the content of questionnaires, the OHIP-14 gives greater weight to psychological and behavioral outcomes, whereas the GOHAI gives greater weight to functional limitations, pain, and discomfort (38). Both OHIP-14 and GOHAI have good internal consistency, reliability, and validity. However, the OHIP-14 is less sensitive to minor impairments of oral health-related quality of life than GOHAI (38). In the present study, the mean GOHAI-add score of iBMS patients was lower than scores previously observed.
in healthy populations of similar age (39-41). Moreover, 94.5% of iBMS patients had a lower self-perceived oral health-related quality of life.

GOHAI-add scores decreased when one’s intensity and duration of pain increased. This disagrees with previous data indicating that disability was not correlated to the intensity of pain (17), but reinforces the hypothesis that intensity of pain may influence self-perceived quality of life. Health-related quality of life is a concept that refers to an individual’s self-perceived mental and physical health status over time. The present data illustrate the relationship between pain duration and oral health-related quality of life in iBMS patients. Our findings suggest a negative influence of taste disturbance on self-perceived quality of life in iBMS patients. This hypothesis is supported by evidence that iBMS patients without taste disturbance expressed better self-perceived oral health-related quality of life than iBMS patients with taste disorder. Taste impairment may lead to food avoidance and/or affect the hedonic aspect of food intake, which is illustrated by a recent study demonstrating that patients with chemosensory abnormalities experience diminished pleasure when eating and impaired quality of life (35).

There were some limitations of this study that need to be considered. First, the number of participants was low and most were women. Although the sample size is limited, its distribution is in accordance with previous studies of iBMS (7,9,10,31). Another limitation is that the dental status of included iBMS patients was not accounted for. Although dental status does not appear to be a risk factor of iBMS, the GOHAI questionnaire is very sensitive to one’s dental status, and the poor oral health status of patients observed in this study might have been influenced by poor dental status. Finally, the present data were based on interviews and need to be confirmed quantitatively.

The present study evaluated the psychological and functional impacts of iBMS. Anxiety and depression were observed in almost one-third of patients. The GOHAI confirmed a poor oral health-related quality of life in iBMS patients. Our findings provide the first evidence that the oral burning sensation and associated oral complaints impact the daily lives of iBMS patients.

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Conflict of interest
We declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

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