NEUROPATHIC PAIN SECTION

Original Research Article

The Relationship Between Sociodemographic Characteristics and Clinical Features in Burning Mouth Syndrome

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Abstract

Objective. To compare sociodemographic and clinical characteristics in patients with burning mouth syndrome (BMS) and their relationship with pain.

Design. Cross-sectional clinical study.

Setting. University-Hospital.

Subjects. 75 BMS patients were enrolled.

Methods. The study was conducted between September 2011 and March 2012 at the "Federico II" University of Naples. Demographic characteristics and clinical information including age, sex, educational level, marital status, job status, age at disease onset, oral symptoms, and triggers were collected via questionnaire interviews. To assess pain intensity the visual analogue scale (VAS) was administered. Descriptive statistics were collected, and Pearson Chi-square tests, Kruskal–Wallis nonparametric tests and the Spearman bivariate correlation were performed.

Results. The mean age was 61.17 (±11.75, female/male ratio = 3:1). The mean age at disease onset was 56.75 (±12.01). A low educational level (8.57 ± 4.95) and 80% of unemployment were found. Job status and age at disease onset correlated with the VAS scale ($P = 0.019$ and $P = 0.015$, respectively). Tongue morphology changes, taste disturbances, and intraoral foreign body sensation have a significant dependence on gender ($P = 0.049$, 0.001, and 0.045, respectively); intraoral foreign body sensation has a significant dependence on marital status ($P = 0.033$); taste disturbances have a significant dependence on job status. ($P = 0.049$); xerostomia has a significant dependence on age ($P = 0.039$); and tongue color changes and a bitter taste have a significant dependence on educational level ($P = 0.040$ and 0.022, respectively). Marital status and educational level have a significant dependence on the triggers ($P = 0.036$ and 0.049, respectively).

Conclusions. The prevalence of BMS is higher in women, and in married, unemployed, and less highly educated patients. Burning is the most frequent symptom while stressful life events are the most frequent trigger reported.

Key Words. Burning Mouth Syndrome; Sociodemographic Factors; Oral Burning; Educational Level; Gender; Oral Pain

Introduction

Burning Mouth Syndrome (BMS) is a complex chronic orofacial pain disorder characterized by an intraoral

burning sensation for which no medical or dental cause can be found, unremitting for at least 4 to 6 months [1,2]. It is identified by three diagnostic criteria: pain in the mouth present daily and persisting constantly or for most of the day, oral mucosa of a normal appearance, and the absence of local and systemic diseases [3,4].

It occurs more commonly in middle-aged and elderly women, and rarely affects individuals under the age of 30 years. The prevalence may vary but ranges from 0.7% to 3.6% in men and 0.6 to 12.2% in women [5,6]. Other studies have reported a higher prevalence ranging from 0.6% to 15%[7–12].

The main symptom is a burning sensation in the oral mucosa and perioral regions that usually has a bilateral and symmetric distribution. Sometimes the pain is described as scalding, tingling, or numbing [13]. Other oral symptoms, such as dysgeusia, a bitter/metallic taste, subjective xerostomia, and foreign body sensation have been reported [14]. Pungent or hot food or beverages, stress, and tiredness have been reported to worsen pain. The corresponding pain alleviating factors are eating, sucking pastilles, drinking cold beverages, and relaxation [15].

The onset is generally spontaneous, and without any recognizable precipitating factors. However, some BMS patients report antecedent dental procedures, the initiation of medications, or stressful life events [16]. Spontaneous remission is rare [17].

The pain has precise physical, anatomical, and pathological dimensions [18], but is also characterized by cultural or universal components in its expression and manifestation, with different interpretations from the social or cultural perspective [19]. This is due to the psychological, social, and cultural dimensions of nociception. In this context, the pain is conditioned by personal and particular elements affecting the individual suffering from the condition, and also by the social elements that identify the individual, such as his or her sociodemographic characteristics [20].

Although BMS has been extensively studied, little is known about the relationships between sociodemographic characteristics, symptoms, and triggers in the onset of disease. Therefore, this study aims to explore 1) the sociodemographic profiles in a sample of BMS patients; 2) the patients' perceived pain intensity, the oral symptoms reported, the triggers in the onset of the disease and the relationships with sociodemographic variables such as gender, age, educational level, marital status, and employment status and; 3) the diagnostic delay comparing the age of the patients with their age at the onset of the disease.

To the best of our knowledge, this is the first study that analyzes the relationships between clinical outcomes and sociodemographic variables.

Materials and Methods

This was a cross-sectional single-assessment clinical study performed at the oral medicine unit of the "Federico II University of Naples."

One hundred and ten BMS cases were screened for possible participation between September 2011 and March 2012. Seventy-five cases were included in the trial in accordance with the inclusion/exclusion criteria. All patients received written information and provided their written informed consent for the management of personal data before their participation.

The study was approved by the Ethics Committee of the Federico II University (approval number 177/08).

The inclusion criteria for BMS were 1) either sex, aged 18 or older; 2) the presence of chronic pain in the oral mucosa in the absence of hard and soft tissue lesions of any kind; 3) pain lasting more than 4 months, continuous throughout the day, with no paroxysm and not following any unilateral nerve trajectory; and 4) the absence of any abnormalities from the following laboratory investigations: salivary flow rates, laboratory tests, and tests for the detection of candidiasis. The exclusion criteria encompassed patients presenting with organic conditions that could be considered a causative factor, such as diabetes, anemia, thyroid disease, hyposcialia-related systemic disorders (e.g., Sjogren's syndrome), contact allergies, psychotic illness, organic brain syndrome, or neurological disease; subjects with signs of parafunctional habits; or patients regularly treated with anxiolytic, antidepressant, anticonvulsant, or psychotropic drugs. Even in the absence of mucosal lesions, a local effect of dental materials related to contact hypersensitivity was excluded by means of patch tests when the symptoms had started after any dental rehabilitation. A final diagnosis of BMS was established only after all other possible causes of the oral complaints had been ruled out.

At admission, each subject underwent a medical anamnesis (including history, clinical features, and age at disease onset), a general medical examination, an intraoral examination and extraoral examination, and laboratory tests (e.g., a full blood cell count, and analyses of serum levels of iron, ferritin, folate, vitamin B12, and glucose).

The data were obtained using face-to-face questionnaire interviews addressing sociodemographic variables, age at disease onset, oral symptoms, and triggers at disease onset. To assess the pain intensity the visual analogue scale (VAS) was administered. The VAS is usually presented as a 10-cm horizontal line, with each point clearly marked. The patient marks on a line the point that they feel represents their perception of their current state. It is a test which is widely used in psychosocial measurements to assess subjective phenomena. It is easy to administer, fast to complete, and with a high response rate [21].

The demographics of the patients such as gender, age, educational level, marital status, and employment status were compared with data relating to South Italy from the recent ISTAT (Italian National Institute of Statistics) census (2011) [22].

Regarding the symptoms, we requested the patients to report the presence of: any change of tongue morphology, change of tongue color, bitter taste, scalding, burning, pain, taste disturbances, xerostomia, sialorrhea, or intraoral foreign body sensation. The patients could indicate one or more symptoms. Furthermore, regarding the triggers, patients were asked to report any precipitating factors such as the starting of any new medications, dental procedures or stressful life events [23] occurring in the time frame of 1–12 weeks before the onset of BMS. In such a case, we suggested that the patients should indicate preferentially one trigger.

Finally, we analyzed the diagnostic delay comparing the age of the patients at their first medical appointment with their age at the onset of the disease.

An oral medicine specialist was responsible for determining the diagnosis of BMS, and for collecting all the demographic and medical data from the patients.

Statistical Analysis

Descriptive statistics, including means, standard deviations, medians, and interquartile range, were used to summarize all the variables. The Pearson Chi-square test was used to verify the significance of any dependence between qualitative variables. Because numerical variables do not have a normal distribution we chose to use nonparametric tests. To verify the significance difference between medians, we performed the Kruskal–Wallis nonparametric test while to measure the degree of correlation we used the Spearman bivariate correlation index.

Results

Table 1 summarizes the demographic and clinical parameters. The demographics of the patient group were compared with data relating to South Italy from the ISTAT 2011 census Website [22].

The number of study years of the patients was 8.57 ± 4.95 (8.12 ± 4.83 for the females and 9.89 ± 5.20 for the males). These data were similar to those of South Italy.

Some differences were detected in marital status and in job status. We found that 6.7% of our patient group were single compared with 29.6% in South Italy, 5.3% were divorced compared with 1.3%, and 12.1% were widowed compared with 7.1%.

There was a higher level of unemployment (60 patients, 80%) compared with the data relating to South Italy

Table 1 Sociodemographic and clinical characteristics of BMS patients

Patient Characteristics	Frequencies (Percentages)	
Gender	Male	19 (25.3)
	Female	56 (74.7)
Education level (in years)	0–4	8 (10.7)
	5–7	27 (36.0)
	8–10	15 (20.0)
	11–13	15 (20.0)
	14–18	10 (13.3)
	Mean $\pm$ SD	8.57 ± 4.95
Age (in years)	20–29	1 (1.3)
	30–39	2 (2.7)
	40–49	9 (12.0)
	50–59	22 (29.3)
	60–69	19 (25.3)
	70–79	19 (25.3)
	>79	3 (4.0)
	Mean $\pm$ SD	61.17 ± 11.75
Marital status	Single	5 (6.7)
	Married	57 (76.0)
	Divorced	4 (5.3)
	Widowed	9 (12.0)
Job status	Employed	15 (20.0)
	Unemployed	60 (80.0)
Age at disease onset (in years)	20–29	2 (2.7)
	30–39	4 (5.3)
	40–49	13 (17.3)
	50–59	21 (28.0)
	60–69	24 (32.0)
	70–79	11 (14.7)
	Mean $\pm$ SD	56.75 ± 12.01
VAS scale	1–4	18(24)
	5–7	29(38.7)
	8–10	28(37.3)

(45%; $P < 0.001$). The percentage of male unemployed patients was 84% compared with 28% in South Italy. The percentage of unemployed women was 80% compared with 60%.

Comparing the age of the patient group with the age at disease onset we found a diagnostic delay of 4.42 ± 0.26 years.

Dependence Analysis of Age at Disease Onset

As shown in Table 2, job status and educational level correlated ($P <0.001$ and $P = 0.006$, respectively) with age at disease onset.

Dependence Analysis of VAS Scale

Table 3 shows the dependence analysis of the VAS scale in relation to gender, job status, and marital

Table 2 Dependence analysis of age at disease onset in relation to gender, job status, marital status, and educational level

	Age at Disease Onset	P Value
Gender		0.094
Male	60.74 ± 14.06	
Female	55.39 ± 11.05	
Job status		<0.001**
Employed	46.33 ± 10.66	
Unemployed	59.35 ± 10.96	
Marital status		0.193
Single	49.80 ± 23.08	
Married	57.82 ± 10.45	
Divorced	47.25 ± 10.05	
Widowed	58.00 ± 13.45	
Educational level	Spearman ρ −0.314	0.006**

The significance difference between the means was measured by the Anova test procedure.
* Significant $0.01 \leq P \leq 0.05$.
** Significant $P \leq 0.01$.

status. Only job status correlated with the VAS scale (P = 0.019). Furthermore, the table shows the dependence analysis of the VAS scale in relation to age, educational

Table 3 Dependence analysis of VAS in relation to gender, job status, marital status, age, educational level, and age at disease onset

VAS

Patient Characteristics		Median–IQR	P Value
Gender	Male	6.0-3.0	0.597
	Female	6.5-6.0	
Marital status	Single	5.8-4.0	0.495
	Married	6.0-4.0	
	Divorced	7.0-6.0	
	Widowed	4.0-3.0	
Job Status	Employed	5.0-3.0	0.019*
	Unemployed	7.0-4.0	
Educational level (in years) vs VAS		−0.124	0.288
Age (in years) vs VAS		0.223	0.055
Age at disease onset (in years) vs VAS		0.279	0.015*

IQR = interquartile range. The significance difference between the medians was measured by the Kruskal–Wallis nonparametric Anova. The correlation was measured by the Spearman correlation coefficient.
* Significant $0.01 < P \leq 0.05$.
** Significant $P \leq 0.01$.

level, and age at disease onset. Only age at disease onset correlated with the VAS scale (P = 0.015).

Analysis of Symptoms and Dependence

Table 4 shows the dependence analysis of the symptoms in relation to gender, marital status, job status, age, educational level, and age at disease onset.

Changes of the tongue morphology, taste disturbances, and intraoral foreign body sensation have a significant dependence on gender (P = 0.049, P = 0.001, and P = 0.045, respectively); intraoral foreign body sensation has a significant dependence on marital status (P = 0.033); taste disturbances have a significant dependence on job status. (P = 0.049); xerostomia has a significant dependence on age (P = 0.039); and changes of tongue color and a bitter taste have a significant dependence on educational level (P = 0.040 and P = 0.022, respectively).

No symptom correlated positively with age at disease onset.

Analysis of Triggers and Dependence

Table 5 shows the dependence analysis of the triggers in relation to gender, marital status, job status, age, educational level, and age at disease onset. Marital status and educational level have a significant dependence on the triggers (P = 0.036 and P = 0.049, respectively).

Initiation of drugs and stressful life events were the most common triggers reported by single BMS patients (40%), stressful life events was the most common trigger reported by married patients (46%) and by widowed BMS patients (44%), and antecedent dental procedures and stressful life events were the most common triggers in divorced BMS patients with the same percentage (50%).

In terms of educational level, the trigger most commonly reported by patients with the lowest level of education (0–4 years) was antecedent dental procedures (50%). The patients with study periods from 5 to 13 frequently reported as a trigger stressful life events while the patients with the highest educational level (14–18) did not identify any specific cause of their disease (50%).

Discussion

Several pain conditions show a remarkable gender-related difference in their prevalence [24]. Men and women do not suffer from the same illnesses or do so with a different intensity and risk [25]. Epidemiological studies have shown that the female gender is itself a risk factor for chronic pain, although these findings appear to be pain site dependent. Gender differences are more consistently found in relation to abdominal pain and headache while instead for orofacial pain

Table 4 Gender, marital status, job status, age, educational level, and age at disease onset differences in relation to symptoms of BMS

Symptoms		Change of Tongue Morphology	Change of Tongue Color	Bitter Taste	Scalding	Burning	Pain	Taste Disturbances	Xerostomia	Scialorrea	Intraoral Foreign Body Sensation
Gender	Male	52.6%	31.6%	42.1%	21.1%	57.9%	42.1%	15.8%	63.2%	5.3%	21.1%
	Female	35.7%	39.3%	41.1%	26.8%	66.1%	42.9%	33.9%	58.9%	0.0%	35.7%
	P value	0.049*	0.377	0.572	0.434	0.521	0.586	0.001**	0.482	0.153	0.045
Marital status	Single	20.0%	40.0%	20.0%	20.0%	40.0%	80.0%	60.0%	60.0%	0.0%	60.0%
	Married	43.9%	35.1%	42.1%	28.1%	70.2%	40.4%	28.1%	57.9%	1.8%	35.1%
	Divorced	0.0%	25.0%	25.0%	0.0%	50.0%	50.0%	25.0%	25.0%	0.0%	0.0%
	Widowed	44.4%	55.6%	55.6%	22.2%	44.4%	33.3%	22.2%	88.9%	0.0%	11.1%
	P value	0.143	0.396	0.350	0.443	0.259	0.308	0.310	0.082	0.907	0.033*
Job status	Unemployed	43.3%	38.3%	43.3%	25.0%	68.3%	41.7%	33.3	60.0%	1.7%	33.3%
	Employed	26.7%	33.3%%	33.3%	26.7%	46.7%	46.7%	13.3	60.0%	0.0%	26.7%
	P value	0.229	0.719	0.482	0.895	0.118	0.727	0.049*	1.000	0.617	0.621
Age (in years)	20–29	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
	30–39	0.0%	0.0%	0.0%	50.0%	0.0%	50.0%	0.0%	50.0%	0.0%	0.0%
	40–49	44.4%	44.4%	22.2%	33.3%	66.7%	33.3%	22.2%	33.3%	0.0%	33.3%
	50–59	31.8%	27.3%	40.9%	31.8%	63.6%	40.9%	31.8%	50.0%	0.0%	31.8%
	60–69	47.4%	52.6%	47.4%	21.1%	73.7%	42.1%	26.3%	73.7%	0.0%	36.8%
	70–79	36.8%	47.4%	47.4%	15.8%	63.2%	47.4%	31.6%	68.4%	5.3%	31.6%
	>79	33.3%	33.3%	66.7%	33.3%	66.7%	33.3%	66.7%	100.0%	0.0%	0.0%
	P value	0.523	0.379	0.125	0.320	0.407	0.881	0.637	0.039*	0.810	0.386
Educational level	0–4	25.0%	50.0%	50.0%	12.5%	62.5%	37.5%	37.5%	87.5%	0.0%	25.0%
	5–7	44.4%	55.6%	48.1%	33.3%	77.8%	59.3%	40.7%	59.3%	0.0%	40.7%
	8–10	40.0%	26.7%	66.7%	33.3%	53.3%	33.3%	33.3%	53.3%	0.0%	13.3%
	11–13	33.3%	33.3%	13.3%	20.0%	66.7%	26.7%	6.7%	53.3%	10.0%	40.0%
	14–18	30.0%	20.0%	20.0%	10.0%	40.0%	40.0%	20.0%	60.0%	1.3%	30.0%
	P value	0.825	0.040*	0.022*	0.422	0.238	0.214	0.124	0.476	0.081	0.361
Age at disease onset	20–29	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	50.0%
	30–39	25.0%	50.0%	50.0%	75.0%	25.0%	50.0%	25.0%	75.0%	0.0%	25.0%
	40–49	38.5%	38.5%	30.8%	30.8%	69.2%	30.8%	15.4%	53.8%	0.0%	30.8%
	50–59	28.6%	23.8%	33.3%	23.8%	61.9%	38.1%	33.3%	47.6%	0.0%	38.1%
	60–69	54.2%	54.2%	58.3%	20.8%	70.8%	**50.0%**	29.2%	66.7%	4.2%	33.3%
	70–79	27.3%	45.5%	36.4%	18.2%	72.7%	36.4%	45.5%	81.8%	0.0%	18.2%
	P value	0.291	0.238	0.276	0.246	0.203	0.397	0.516	0.076	0.805	0.884

The significance difference between the conditional distributions was measured by the Pearson Chi-square test.

* Significant $0.01 < P \leq 0.05$.

** significant <0.001.

Table 5 Gender, age, educational level, job status, marital status, and age at disease onset differences in relation to triggers of BMS

Trigger		Undefined	Initiation of Medications	Antecedent Dental Procedures	Antecedent Dental Procedures/Stressful Life Events	Stressful Life Events	P Value
Gender	Male	47.4%	5.3%	10.5%	5.3%	31.6%	0.089
	Female	23.2%	3.6%	23.2%	0.0%	50.0%	
Marital status	Single	20.0%	40.0%	0.0%	0.0%	40.0%	0.036*
	Married	31.6%	1.8%	19.3%	1.8%	45.6%	
	Divorced	0.0%	0.0%	50.0%	0.0%	50.0%	
	Widowed	33.3%	0.0%	22.2%	0.0%	44.4%	
Job status	Unemployed	30.0%	3.3%	25.0%	1.7%	40.0%	0.180
	Employed	26.7%	6.7%	0.0%	0.0%	66.7%	
Age (in years)	20–29	100.0%	0.0%	0.0%	0.0%	0.0%	0.137
	30–39	0.0%	50.0%	50.0%	0.0%	0.0%	
	40–49	22.2%	0.0%	22.2%	0.0%	55.6%	
	50–59	22.7%	4.5%	18.2%	0.0%	54.5%	
	60–69	15.8%	0.0%	21.1%	5.3%	57.9%	
	70–79	42.1%	5.3%	21.1%	0.0%	31.6%	
	>79	100.0%	0.0%	0.0%	0.0%	0.0%	
Educational level	0–4	12.5%	0.0%	50.0%	0.0%	37.5%	0.049*
	5–7	29.6%	0.0%	22.2%	0.0%	48.1%	
	8 –10	40.0%	0.0%	13.3%	0.0%	46.7%	
	11–13	13.3%	13.3%	0.0%	6.7%	66.7%	
	14–18	50.0%	10.0%	30.0%	0.0%	10.0%	
Age of disease onset	20–29	50.0%	50.0%	0.0%	0.0%	0.0%	0.383
	30–39	25.0%	0.0%	25.0%	0.0%	50.0%	
	40–49	23.1%	0.0%	30.8%	0.0%	46.2%	
	50–59	19.0%	4.8%	14.3%	0.0%	61.9%	
	60–69	33.3%	4.2%	16.7%	4.2%	41.7%	
	70–79	45.5%	0.0%	27.3%	0.0%	27.3%	

The significance difference between the conditional distributions was measured by the Pearson Chi-square test.

* Significant $0.01 < P \leq 0.05$.

** Significant $P \leq 0.01$.

consistent gender differences in prevalence have not been established [26].

The true prevalence of BMS is difficult to establish due to the lack of rigorous diagnostic criteria in many studies which do not make any distinction between the secondary symptoms of oral burning and the syndrome itself. For this reason, estimates of the prevalence of BMS range from 0.7% to 7% of the general population and increase to 12–18% for postmenopausal women [27–29]. BMS occurs at a 90% higher rate in women than in men [30,31] and usually presents from 3 years before to 12 years after menopause [5]. The reported gender ratio of the affected patients (females to males) has ranged from 3:1 to 16:1. [32,33]. In our study, the male/female ratio was 1:3.

Multiple biopsychosocial mechanisms contribute to gender differences in BMS conditions, including sex hormones, endogenous opioid function, genetic factors, pain coping, and catastrophisizing, and gender roles [28].

BMS occurs in middle aged and elderly subjects with an age range from 27 to 87 but rarely affects individuals under the age of 30 years, never having been described in children or adolescents. It usually occurs in the fifth to seventh decade of life [6].

The mean age of our patients was 61 years with a peak between 50 and 59 (22 patients); we had only one patient of 29 years. Furthermore, BMS occurs later in men than in women (65 compared with 60 years).

In this study, we found the same educational level in BMS patients as in the general South Italy population, revealing a higher percentage of BMS patients with a low educational level (less than 8 years, 35 patients, 46%).

On the contrary, in terms of marital status and job status, the data of the sample were different from those reported for South Italy. We found a higher percentage of married patients and widowed patients, and a lower percentage of single patients. Moreover, we found a higher percentage of unemployment (80%). Unemployment seems to be the most important stressful life event in our patients.

Through a comparison of the age at BMS onset and the age of the patients, we evaluated the professional diagnostic delay. Mignogna et al. in 2005, found that it usually takes 34 months to arrive at a definitive diagnosis (range, 1–348 months; median, 13 months). The average number of medical and dental practitioners consulted by each patient over this period and who initially misdiagnosed BMS was 3.1 (range, 0–12; median, 3) [34].

In this study, the diagnostic delay was 4.42 ± 0.26 years (median 53 months). Therefore, we can argue that the health care providers' awareness of BMS, in 9 years, has not improved.

Gender and marital status did not influence age at disease onset. Conversely, educational level and job status were correlated with this factor ($P < 0.001$ and $P = 0.006$, respectively). In fact, BMS is recognized earlier in patients who have a higher educational level and are employed. A higher level of education seems to lead to a more informed patient with a better understanding of the relationship between stressful events and somatic disorders.

Furthermore, stress in the workplace could predispose some people to somatic symptoms [35].

In literature, oral mucosal burning pain represents the principal symptom of BMS. Pain levels may vary from mild to severe [36,37]. The mean severity of BMS pain has been assessed at about 5–8 cm (or 50–80 mm) on a 10-cm (100 mm) VAS scale [38,39].

Our data were in line with the current literature, because oral burning was present in 59 patients (79%); the Median-IQR of VAS in men was 6.0–3.0 and in women 6.5–6.0.

Consistently, the literature suggests that females may rate their pain as being more intense than males [40]. However, we did not observe any statistically significant difference in pain intensity in relation to gender. The pain intensity is equally high in men and women, being independent of gender ($P = 0.597$).

Hungria et al., in relation to temporomandibolar disorders (TMD) found that patients with a lower educational level suffer more from pain than people with a higher educational level. However, in our patients pain was not related to educational level ($P = 0.288$) [41].

In other chronic pain conditions, Goulet et al. found that age influences the intensity of pain. In that study, the authors found that individuals in the elderly group (55+) were three times more likely to rate jaw pain as severe than the younger age group (18–34) [42]. In contrast, in our study, the age of the patients was not related to the pain intensity ($\rho = 0.223$, $P = 0.055$).

Job status and age at disease onset were correlated with the VAS scale in this study ($P = 0.019$ and 0.015, respectively). Generally, pain intensity in orofacial pain syndromes (such as temporomandibular disorders) will increase with the duration of the illness [43]. This tendency was observed in our sample of BMS patients; it is conceivable that the prolonged time for diagnosis (median 53 months), and the absence of any treatment could contribute to increasing the psychological stress of the patients and consequently the pain intensity.

Unemployed patients showed higher values on the VAS scale compared with employed patients. Unemployment could contribute to the psychological stress of patients and, consequently, could influence directly the pain intensity.

Clinical presentations of BMS may vary as some patients can be monosymptomatic (burning or pain only) or oligosymptomatic [29]. Generally, in BMS, oral burning alone is rare, it being more frequently associated with one or more other oral symptoms, such as xerostomia, paresthesia, and altered taste [3].

Other authors have reported xerostomia in approximately 46–67% of BMS patients [2,33]; in our study, xerostomia was the most frequent symptom after oral burning (45 patients, 60%).

In contrast with the current literature that has reported dysgeusia in almost 70% of BMS patients [1,38,44], in our study taste disturbances was ranked in eighth place (22 patients, 30%). A bitter taste, a very specific oral sensation, was in third place (32 patients, 43%). We found that taste disturbances were frequent in women (34% compared with 16%) and in the unemployed (33% compared with 13%).

Another factor to consider is that our patients show an excessive concern about their health and are focused on inspecting their mouth many times during the day, noting any changes of the tongue morphology and tongue color. They evaluate mainly the tongue probably because this is the site most affected by symptoms. A changing of the tongue morphology was noted principally by men (52% compared with 36%) A changing of the tongue color was observed frequently in patients with a lower educational level (5–7 years; 55%).

The age at disease onset did not modify the quality of the symptoms reported by our patients.

The onset of BMS is spontaneous although some patients report antecedent dental procedures, the initiation of medications, or other illnesses [16,29,44].

In this study, the most frequent trigger reported was stressful life events (34 patients, 45%); in contrast with the current literature, antecedent dental procedures were in third place (15 patients, 20%).

Through the analysis of dependence, we can see that gender, job status, and age at disease onset did not influence the triggers in BMS. On the contrary, marital status and educational level were associated.

The surprising dependence on marital status needs to be addressed by further studies: at the moment no hypothesis seems to be appropriate.

Antecedent dental procedures was the most common trigger in patients with the lowest educational level (50%) while patients with the highest level of education fail to find a cause for their BMS (50%).

In conclusion, BMS remains an important medical condition which often places a significant burden on both the patient and the health care system.

This article reports that BMS occurs more frequently in women than men. Nevertheless, gender does not influence pain intensity perception, which is equally high in women and in men. Pain intensity is higher in the unemployed and is related to diagnostic delay. A longer time in reaching a diagnosis is connected with higher pain intensity.

Burning is the most frequent symptom while stressful life events is the most frequent trigger reported in patients with BMS.

Within the limitations of the study, it can be concluded that the sociodemographic characteristics of patients could play a role in determining the clinical features of BMS. However, further investigations and multicentric studies are needed to support our hypothesis.

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