

# Burning Mouth Syndrome in Zahedan; the Southeast of Islamic Republic of Iran

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## Abstract:

**Statement of Problem:** Burning mouth syndrome (BMS) is characterized by a burning sensation in the tongue or other oral sites, usually in the absence of clinical and laboratory findings.

**Purpose:** The aim of this study was to evaluate the main epidemiological and clinical features involved in burning mouth syndrome in Zahedan; southeast of Iran.

**Materials and Methods:** In this case series study, 89 BMS patients were selected from those referred to the Department of the Oral Medicine, Faculty of Dentistry, and Khatam-ol-anbia, central hospital, Zahedan University of Medical Sciences, during 2002 to 2003. The study group consisted of 62 female (69.7%) and 27 male (30.3 %) patients, with a mean age of 60.9 years, ranging from 40 to 89 years. In all cases a study protocol, specially designed for this disease was completed, including general, medical and oral information and an intraoral examination. Comparative and descriptive statistical analysis was performed. The Chi-square test was considered significant at  $p < 0.05$ .

**Results:** The 50-59 years age group showed the highest prevalence among the studied cases (24.3%). The tongue was the most frequent location of symptoms, affected in 86 patients (96.6%). In addition to the burning sensation, 25.8% and 48.3% of the patients complained of oral dryness and dysgeusia, respectively. Type III BMS was the most common subtype (50.6%). In women, 90.3% were postmenopausal. Type II diabetes was observed in 36% of the patients and 37.1% suffered from respiratory disease, 23.6% from gastritis, 15.7% from liver diseases, 30.3% from renal disease, 40.4% from hypertension and 43.8% had sleep disorders. Also, 52.8% revealed seasonal allergy, 32.6% had temporomandibular joint disorders and 59.6% had poor oral hygiene.

**Conclusion:** BMS is a complex and multifactorial disease process in which numerous possible etiologies must be eliminated before the proper treatment can be initiated.

**Key Words:** Burning mouth syndrome; Epidemiology; Dysgeusia; Allergy; Oral hygiene

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## INTRODUCTION

Burning mouth syndrome (BMS) has been defined as burning pain in the tongue or oral mucous membranes, usually without accompanying other clinical and laboratory findings [1-4]. Affected patients often present with multiple oral complaints, including burning, dryness and taste alterations [1,2,5-8].

In the past few years, some investigators have disputed this definition, arguing that it is too restrictive and suggesting that the syndrome may exist coincidentally with other oral conditions [8]. BMS has been estimated to affect more than one million Americans [9,10]. There is a strong female predilection, with most female patients being postmenopausal

and the age of onset being approximately 50 years [2,9,10)]. There are many symptoms associated with BMS, which generally do not conform to anatomic boundaries. The tip of the tongue is the most common location (71%), followed by the lips (50%), lateral borders of the tongue (46%), dorsum of the tongue (46%), and palate (46%) [11]. Lamb et al. developed a classification system to group the varied course of symptoms [12]. BMS type 1 is defined as the absence of symptoms upon awakening, with gradual increase in severity as the day progresses, reaching its peak intensity by evening [5,12]. This type is linked to systemic disorders such as diabetes, nutritional deficiency, etc [6,12]. Type 2 patients present continuous symptoms throughout the day, and often make difficulty in sleeping for many individuals [6]. This group often reports mood changes, alternations in eating habits and a decreased desire to socialize, which seem to be due to an altered sleep pattern [5,6]. Type 3 patients are characterized as those with days of remission, which follows no specific pattern [12]. Frequently, these patients show anxiety and allergic reaction, particularly to food additives [6].

There has been no clear consensus on the etiology, pathogenesis or treatment of burning mouth syndrome [2,13]. As a result, patients with inexplicable oral complaints are often referred from one health care professional to another, without effective management [14]. This situation not only adds these complaints to the health care burden but also has a significant emotional impact on patients, who are sometimes suspected of imagining or exaggerating their symptoms [1]. Since the causes of BMS are multi-factorial and remain poorly understood [2], patients suffering from BMS are often evaluated by several clinicians, including the general practitioners, internists, otolaryngologists, pain specialists, oral and maxillofacial surgeons, dentists, and oral

medicine practitioners. For this reason, it is important that a wide variety of specialists be able to recognize the signs and various causes of burning mouth syndrome, particularly those that fall outside of their special field [9]. In this preliminary study, the main clinical and epidemiological features involved in burning mouth syndrome were investigated in Zahedan (southeast of Iran), in order to show the characteristics of BMS patients in this region.

## MATERIALS AND METHODS

A case series study has been performed on 89 BMS patients selected from those referred to the Department of the Oral Medicine Faculty of Dentistry, and the central hospital of Khatam-ol-anbia, Zahedan University of Medical Sciences, during 2002 to 2003. The study group consisted of 62 female (69.7%) and 27 male (30.3 %) patients, with a mean age of 60.9 years ranging from 40 to 89 years. To obtain a diagnosis, all the clinical features had to be coherent with the BMS definition. BMS is defined as a chronic burning, itching and/or painful sensation which may be present along the day, in a mouth with clinically normal mucosa, and no clinical or histological changes that may explain the symptoms [11]. In all cases a designed study protocol was completed, including general, medical and oral information and an intraoral examination. A visual analogue scale, ranging from 0 to 10 (0 is no burning and 10 the worst burning imaginable) was used for the measurement of the burning/painful sensation.

Comparative and descriptive statistical analysis was performed. The Chi-square test was considered significant at  $p < 0.05$ .

## RESULTS

Patients with an age range of 50-59 years showed the highest prevalence among the BMS cases (24.3%). The male/female ratio was 1/2.3. The tongue was the most frequent symptomatic location, affected in 86 patients

(96.6%) followed by the lips (20.2%) (Table I). The intensity of the burning sensation was estimated as 8.1, ranging from 5 to 10, on a visual analogue scale graded from 0 to 10. In addition to burning sensation, 25.8% of the patients reported oral dryness and 43 (48.3) complained of dysgusia. According to the classification proposed by Lamb et al [12], 45 patients (50.6%) presented as type III, 23 (25.8%) revealed type II, and 21 (23.6%) demonstrated type I BMS. Regarding medical history, 56 (90.3%) women were postmenopausal, 32 patients (36%) had type II diabetes, 33 patients (37.1%) suffered from respiratory disease, 21 (23.6%) from gastritis, 14 (15.7%) from liver diseases, 27 (30.3%) from renal disease, 36 (40.4%) from arterial hypertension, and 47 (52.8%) smoked more than 20 cigarettes a day. Also, 39 patients (43.8%) had difficulties falling asleep, and 47 (52.8%) had seasonal allergy (Table II). Considering oral and maxillofacial factors, six patients wore dentures (6.7%), 29 (32.6%) demonstrated temporomandibular joint disorders and 54 (60.7%) had parafunctional habits. Fifty three (59.6%) subjects revealed poor oral hygiene, with 27 (50.9%) complaining of gingival bleeding after tooth brushing (Table III). Positive familial history of BMS was observed in 15 (16.9%) patients.

**Table I:** Symptom localization in BMS patients in Zahedan.

Location	Number	%
Body of the tongue	83	96
Base of the tongue	3	3.37
Lips	18	20.2
Cheek	6	7.74
Vestibule	2	2.24
Oral floor	2	2.24
Lips and Gingival mucosa	4	4.49
Gingiva and soft palate	4	4.49
Lips, gingiva and soft palate	2	2.24

**Table II:** Medical history in BMS patients in Zahedan.

Medical information	Number	%
Postmenopause	56	90.3*
Respiratory disease	33	37.1
Gastritis	21	23.6
Liver disease	14	15.7
Hypertension	36	40.4
Diabetes mellitus type II	32	36
Smoking	47	52.8
Addiction	6	6.7
Difficulties in fall asleep	39	43.8
Seasonal allergy	47	52.8

Number of patients= 89, \* of 62 women

A statistically significant relationships was not found between dry mouth and gender, menopause, sleep disorders and other studied factors ( $p>0.05$ ). A statistical significant relation was observed between poor oral hygiene and smoking and gingival bleeding ( $P<0.001$ ).

## DISCUSSION

The mean age and the age range of the patients in the present study were similar to those of other investigations [1,8,11,15,17,18]. A total of 89 BMS subjects were studied and the male to female ratio was found to be 1/2.3, which was reported as 1/7 by others [6,12,15]. Over 90% of the women were in their postmenopausal stages. Based on the most of

**Table III:** Results of oral examination of BMS patients in Zahedan.

Oral exploration	Number	%
Dry mouth	23	25.8
TM joint disorders	29	32.6
Use of dentures	6	6.7
Poor oral hygiene	53	59.6
Parafunctional habits	54	60.7
Gingival bleeding	27	30.3
Dysgusia	43	48.3%

the studies, oral burning appears to be most prevalent in postmenopausal women [1,2,5,6,8,9,15-17], it has been reported in 10 to 40 percent of female patients presenting for treatment of menopausal symptoms. These percentages are in contrast to the much lower prevalence rates for oral burning in epidemiologic studies (0.7 to 2.6 percent) [1]. The reason for the gender difference between study populations and epidemiologic studies (which demonstrate a more equal distribution of oral burning symptoms in men and women) may be related to the definition used in each study design. Hormonal changes are still considered to be important factors in burning mouth syndrome [1,10], although there is little convincing evidence of the efficacy of hormone replacement therapy in postmenopausal women with this disorder [1,6]. Various studies on this syndrome indicate that approximately 90 percent of the women have been postmenopausal, with the greatest frequency of onset reported from three years before to 12 years after menopause [6,19]. Thus our findings also confirm that BMS mainly affects postmenopausal women. According to the results of the present study, the tongue followed by the lips were the most frequent locations of symptom expression. Other studies have also shown that the burning sensation often occurs in more than one oral site, with the anterior two thirds of the tongue, the anterior hard palate and the mucosa of the lower lip most frequently involved [1,5,6,8,9]. Eguia Del Valle et al [11] reported that the tip of the tongue was the most common location (71%), followed by the lips (50%), lateral borders of the tongue (46%), dorsum of the tongue (46%), and palate (46%); which is almost similar to our findings. Lamb et al. developed a classification system to group the varied course of symptoms and defined three types of BMS (12). By using this classification, type III BMS was found to be the most common type in the current study.

Type III BMS patients are characterized as those with days of remission, which follows no specific pattern. Type I [1, 5,8,9,18] and type II [11, 22] BMS have been reported as the prevalent type in other studies. The fact that most of our patients had seasonal allergy is supported by studies that indicate anxiety and allergic reactions to be more common in type III BMS [6]. Little information is available on the natural course of burning mouth syndrome. Spontaneous partial recovery within six to seven years after onset has been reported in up to two thirds of the patients, with recovery often preceded by a change from constant to episodic burning. No clinical factors predicting recovery have been noted [1,17].

In our study 43.8% of the patients had sleep disorders. According to other studies, BMS patients often state that pain interferes with their ability to fall asleep. Perhaps because of sleep disturbances, constant pain, or both, patients with oral burning pain often have mood changes, including irritability, anxiety and depression [1,6,20]. Personality and mood changes (especially anxiety and depression) have been consistently demonstrated in patients with burning mouth syndrome and have been used to suggest that the disorder might be a psychogenic problem ([1,6,21]. However, psychological dysfunction is common in patients with chronic pain and may be the result of the pain rather than its cause [1,6,9].

The intensity of the burning sensation was estimated to be 8.1 (range 5-10) on a visual analogue scale, indicating severe pain in the studied patients. Earlier investigations frequently minimized the pain of burning mouth syndrome, but more recent studies have reported that the pain ranges from moderate to severe and is similar in intensity to toothache [1,6]. In our study 25.8% and 48.3% of the patients reported oral dryness and dysgusia, respectively. Most studies have found that oral burning is frequently accompanied by other

symptoms, including dry mouth and altered taste [1,10]. It is not surprising that dry mouth has been suggested as an etiologic factor, in view of the higher incidence of this problem in patients with burning mouth syndrome [1,11]. However, most salivary flow rate studies in affected patients have shown no decrease in unstimulated or stimulated salivary flow [10]. Several studies have demonstrated alterations in various salivary components, such as mucin, IgA, phosphates, pH and electrical resistance [1,10]. The relationship of these changes in salivary composition to burning mouth syndrome is unknown, but the changes may result from altered sympathetic output related to stress, or from alterations in interactions between the cranial nerves serving taste and pain sensation [1]. Alterations in taste occur in as many as two thirds of the patients and often include complaints of persistent tastes (bitter, metallic, or both) or changes in the intensity of taste perception. Dysgeusic tastes accompanying oral burning are often reduced by stimulation with food [1,10,21].

In our study the prevalence of type II diabetes mellitus was higher than other studies [9,11]. The correlation between diabetes mellitus and BMS is still controversial. It has been suggested that type II diabetes mellitus plays a role in BMS development [6,12]. In contrast, other studies report a lack of association between these two conditions [6,22]. A possible explanation for this controversy may be that the reported patients were erroneously classified as having BMS. A lack of strict criteria for the diagnosis of BMS could have affected the inaccurate selection of the patients, for instance burning oral complaints in diabetic subjects, who are more prone to oral infections are probably caused by oral candidiasis [23]. Also, the lack of data cannot exclude the possibility that the alteration of pain thresholds in BMS, is related to neuropathy, which is a common, though usually late, complication in type II diabetes

mellitus [24].

In our study 37.1% of the subjects suffered from respiratory disease, 23.6% from gastritis, 15.7% from liver diseases, 30.3% from renal disease, 40.4% from hypertension, and 32.6% from TM joint disorders. Although burning mouth syndrome has not been linked to any specific medical condition, associations with a wide variety of concurrent health and chronic pain conditions, including headaches and temporomandibular joint pain, tenderness, pain in masticatory, neck, shoulder and suprahyoid muscles have been documented [6].

In the present study 59.6% of the patients had poor oral hygiene, and 50.9% of these subjects presented with gingival bleeding after brushing their teeth. This is similar to the results obtained by Eguia Del Valle et al [11]. It is proposed that plaque and tartar accumulation on teeth surfaces of these patients is an irritating factor for gingival and oral mucosa, which can potentiate other oral irritating factors.

In our study a considerable percentage of the patients (60.7%) revealed a history of parafunctional habits. Several investigations have also observed parafunctional habits such as bruxism, tooth grinding and clenching, tongue thrusting, lip and cheek biting [6], lip pressure, lip sucking and mouth breathing [22] in BMS patients.

In our study 52.8% of the subjects had seasonal allergy. It has been shown that frequently patients with type III BMS show anxiety and allergic reaction, particularly to food additives [6]. The climate of this region of Iran is windy and dry; therefore it would be logical to assume that it could be responsible for the high prevalence of allergy and respiratory disease observed in BMS patients of Zahedan. It seems that the high prevalence of seasonal allergy in our patients caused dry mouth and mouth breathing. Several studies indicate that chemical irritation and allergic reactions to dental materials and galvanic

currents between dissimilar metals are not important causes of burning mouth syndrome [1]. On the other hand, stronger evidence suggests that dry mouth in allergic BMS patients is more likely to be related to idiosyncratic side effects from an extensive abuse of antihistamines [6].

## CONCLUSION

Within the limitation of this study it can be concluded that BMS patients in Zahedan are principally postmenopausal women, and most of them are classified as type III BMS. The majority of the subjects had tongue burning, type II diabetes, respiratory diseases, gastritis, difficulties in fall asleep, poor oral hygiene and seasonal allergy. In conclusion this study shows that BMS is a complex and multifactorial disease process in which numerous possible etiologies must be eliminated before the proper treatment can be initiated. A psychosocial history, in addition to a detailed dental and medical history, seems to be crucial in diagnosing these patients in order to develop an effective treatment.

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# سندرم سوزش دهان در استان زاهدان

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## چکیده

**بیان مسأله:** سندرم سوزش دهان عبارتست از احساس سوزش در ناحیه زبان و یا دیگر نواحی دهان که عمدتاً با هیچ‌گونه یافته آزمایشگاهی یا کلینیکی دیگر همراه نیست.

**هدف:** هدف از این مطالعه ارزیابی شاخصه‌های اپیدمیولوژیک و کلینیکی عمده سندرم سوزش دهان در زاهدان می‌باشد.

**روش تحقیق:** در این مطالعه Case series، هشتاد و نه بیمار مبتلا به سندرم سوزش دهان، از بین مراجعان به بخش بیماریهای دهان دانشکده دندانپزشکی و بیمارستان خاتم‌الانبیای زاهدان در طی سالهای ۲۰۰۲-۲۰۰۳ انتخاب شدند. بیماران شامل ۶۲ زن معادل ۶۹/۷٪ و ۲۷ مرد برابر ۳۰/۳٪ با حدود سنی ۴۰-۸۹ سال و میانگین ۶۰/۹ سال بودند. در تمامی بیماران پروتکل مطالعه شامل جمع‌آوری اطلاعات شخصی، پزشکی و دهانی بیماران بود و ارزیابی داخل دهان انجام پذیرفت. داده‌ها با استفاده از آزمون Chi-Square و با در نظر گرفتن  $P < 0/05$  آنالیز شدند.

**یافته‌ها:** بیشترین شیوع در گروه سنی ۵۰-۵۹ سال معادل ۲۴/۳٪ دیده شد. زبان شایعترین ناحیه درگیر به میزان ۸۶ مورد، معادل ۹۶/۶٪ بود. همچنین ۲۵/۸٪ از بیماران از خشکی دهان و ۴۸/۳٪ آنها از اختلال در تکلم شکایت داشتند. شایعترین نوع سندرم سوزش دهان، نوع سوم آن با فراوانی ۵۰/۶٪ بود. در زنان، ۹۰/۳٪ افراد در مرحله یائسگی قرار داشتند. دیابت نوع II در ۳۶٪، بیماریهای تنفسی در ۳۷/۱٪، گاستریت در ۲۳/۶٪، بیماریهای کبدی در ۱۵/۷٪، بیماریهای کلیوی در ۳۰/۳٪، افزایش فشار خون در ۴۰/۴٪ و اختلال خواب در ۴۳/۸٪ بیماران دیده شد. همچنین ۵۲/۸٪ بیماران از آلرژی فصلی شکایت داشتند. ۳۲/۶٪ دچار اختلالات مفصل گیجگاهی-فکی و ۵۶/۹٪ هم دارای بهداشت دهانی نامناسب بودند.

**نتیجه‌گیری:** سندرم سوزش دهان یک بیماری پیچیده و چند عاملی است که علل مختلف آن باید قبل از شروع به درمان، حذف شوند.

**واژه‌های کلیدی:** سندرم سوزش دهان؛ اپیدمیولوژی؛ اختلال در تکلم؛ آلرژی؛ بهداشت دهان

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