

## Prevalence of burning mouth syndrome in adult Turkish population

### *Yetişkin Türk toplumunda ağız yanması sendromu prevalansı*

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#### ABSTRACT

**Objectives:** Burning mouth syndrome (BMS) is defined as a chronic orofacial pain condition, characterized symptomatically by burning pain localized to the tongue and lips or may involve the entire oral cavity. The prevalence of burning mouth symptoms reported from international studies ranges from 0.6% to 15%. The aim of this study was to determine the prevalence of burning mouth syndrome in adult Turkish population.

**Materials and methods:** A questionnaire was designed to collect data on demographic characteristics, medical history and drugs taken by the patients and clinical examination was performed. A cross-sectional study was carried out on 1000 (500 men and 500 women) randomly selected patients who attended attending to Kırıkkale University Dental Faculty Department of Restorative Dentistry.

**Results:** BMS was diagnosed in 12 patients with 0.12% prevalence in 2 man and 10 women, with 1:5 ratio respectively. The most common site for BMS was tongue. Para functional habits were the most common local factor. According to visual analogue scale (VAS) mean ( $\pm$ SD) level of burning intensity was 5.45 ( $\pm$ 1.69).

**Conclusions:** Burning Mouth Syndrome in Turkish population has low prevalence and is more frequent in females.

**Key words:** Burning mouth syndrome, Turkish population, prevalence

#### ÖZET

**Amaç:** Ağız yanması sendromu (AYS) kronik bir orofasiyal ağrı olarak tanımlanır ve semptomatik olarak dilde ve dudakta veya bütün ağız boşluğu içinde yangı tarzında bir ağrıyla karakterizedir. Uluslararası çalışmalarda Ağız yanması sendromunun prevalansının %0,6 ile %15 arasında değiştiği rapor edilmektedir. Bu çalışmada Türk toplumunda AYS prevalansının belirlenmesi amaçlanmıştır.

**Gereç ve yöntem:** Demografik özellikler, tıbbi öykü ve hastalar tarafından alınan ilaçlar ile birlikte klinik verileri de içeren bir anket formu oluşturuldu. Bu kesitsel çalışma Kırıkkale Üniversitesi Diş Hekimliği Fakültesi Restoratif Diş Hekimliği bölümüne başvuran katılımcılar arasından rastgele seçilen 1000 hasta (500 kadın ve 500 erkek) üzerinde gerçekleştirilmiştir.

**Sonuçlar:** 12 hastada ağız yanması sendromu tespit edilmiştir prevalansı %0,12 olarak bulunmuştur. Bu hastaların 2'si erkek ve 10'u kadındır. Erkek kadın oranı 1:5 olarak bulunmuştur. Ağız yanması sendromu en çok dilde görülmüştür. Parafonksiyonel alışkanlıklar en yaygın faktör olarak gözlemlenmiştir. Görsel analog skala (VAS) sonuçlarına göre ortalama ( $\pm$ SD) yangı şiddeti seviyesi 5,45( $\pm$ 1,69) olarak bulunmuştur.

**Sonuç:** Ağız yanması sendromunun Türk toplumunda prevalansı düşük olup kadınlarda daha sık rastlanmaktadır.

**Anahtar kelimeler:** Ağız yanması sendromu, Türk toplumu, prevalans

#### INTRODUCTION

Burning Mouth Syndrome (BMS) is a condition presented with burning sensation without any patho-

logic changes of oral mucosa. <sup>1</sup> Different terms are used for its identification, including stomatopyrosis (mouth burning), glossopyrosis (tongue burning),

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stomatodynia (mouth pain), glossodynia (tongue pain) and oral dysesthesia.<sup>2</sup>

Multiple conditions have been implicated in the causation of burning mouth disorder.<sup>3</sup> Current literature favors neurogenic, vascular and psychogenic etiologies.<sup>3,4</sup> However, other conditions, such as xerostomia, candidiasis, referred pain from the tongue musculature, chronic infections, reflux of gastric acid, medications, blood dyscrasias, nutritional deficiencies, hormonal imbalances and allergic and inflammatory disorders, need to be considered.<sup>5,8</sup> As a result of the variations in experienced symptoms, and despite the fact that numerous studies have been carried out, there is no universal consensus on the diagnosis, etiology and treatment of BMS.<sup>9</sup> This leads to patients being referred from one health care professional to another, causing an increased burden on both the health care system and the patient.<sup>9</sup> Burningmouth syndrome is most prevalent in postmenopausal women, although men and younger women can also be affected.<sup>10</sup> It has not been described in adolescents. It has been reported in 10-40% of women presenting for treatment of menopausal symptoms.<sup>11</sup>

The prevalence of BMS reported for the general population varies between 0.7 and 15%.<sup>11,12</sup> Basker and coworkers<sup>13</sup> reported the prevalence of BM to be between 2.6% and 11% in different groups of patients. In a survey among randomly selected men and women of ages 20-69 years in Northern Sweden the prevalence of BMS increased from 0.7% to 3.6% in men and from 0.6% to 12.2% in women with increasing age.<sup>12</sup> In an epidemiologic study conducted in the United States, the overall prevalence of burning mouth was found to be 0.7% in adults up to age 65.<sup>14</sup> Interestingly, Riley and colleagues<sup>15</sup> repeated this telephone interview study in a subset of 5800 individuals aged 65 or older and reported a prevalence of only 1.7% for burning mouth pain.

Several different patterns of pain are usually associated with BMS. One such classification<sup>16</sup> contains three subtypes according to variations in pain intensity over 24 hours. Type 1 BMS is characterized by the absence of symptoms upon waking, with a burning sensation that develops in late morning and increases in severity as the day progresses (35%). This sensation is present every day and associated psychological factors are usually absent in these patients. Type 2 patients present continuous

symptoms throughout the day, and often make difficulty in sleeping for many individuals.<sup>11</sup> 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.<sup>10,11</sup> Type 3 BMS is characterized by intermittent symptoms with pain-free periods during the day and variable presence between days. These patients experience pain-free periods during the day. This type constitutes 10% of BMS patients and tends to affect unusual sites such as floor of mouth, buccal mucosa, and throat.<sup>16</sup> These patients frequently display anxiety and allergic reactions, particularly to food additives.<sup>1</sup> The aims of this cross-sectional study were to estimate the prevalence of BMS in an adult population from 20 years of age and upwards in sample Turkish population.

## MATERIALS AND METHODS

A cross-sectional study was carried out on 1000 (500 men and 500 women) randomly selected patients who attended attending to Kırıkkale University Dental Faculty Department of Restorative Dentistry.

A questionnaire was designed to collect data on demographic characteristics, medical history and drugs taken by the patients. Also history of radiotherapy, chemotherapy and psychological problems were included. Other questions were about the status of menopause in female patients, details regarding smoking and its onset, number of cigarette smoked per day, wearing denture or not, difficulty in swallowing, presence of tinnitus in the ear, burning sensation, onset and site of burning.

After questionnaire all of the patients with BMS were examined by three dentists in order to identify those with BMS. In clinical examination, local, systemic and psychological factors were assessed. Local factors leading to burning sensations of the oral mucosa include the: presence of local factors such as poor oral hygiene, galvanism, oral candidiasis, oral malignancies, parafunctional habits (tongue thrusting, bruxism), fitting dentures, saliva and salivary gland function, allergic reactions related to specific dental materials were assessed. Moreover, the characteristics, duration, onset and location of the pain and any medication that can induce xerostomia (typically antihypertensive and psychotropic agents) presence of dysgeusia and/or

perceived xerostomia were obtained. In addition the history of systemic disease such as thyroid abnormalities, nutritional deficiencies, diabetes mellitus were also taken.

Additional information regarding concomitant problems such as personality and mood changes which have been consistently demonstrated in patients with BMS and depression, masked depression, anxiety, cancerphobia, and emotional states are counted among the psychological factors related to BMS was carefully obtained from patients.

The intensity of the burning sensations was measured by using a visual analogue scale (VAS) graded from 0 to 10, where 0 is no burning and 10 the worst burning imaginable. The frequency of the Burning was recorded as: intermittent and seldom, intermittent and often, or continuous. The presence of burning was classified as present in the morning, evening, daytime, night or day and night.

## RESULTS

Questionnaires for 1000 patients, 500 men and 500 women were completed and necessary clinical examinations performed. BMS of 12 patients was diagnosed in 1500 patients, 2 man and 10 women, with 1:5 ratio respectively (Table 1). Table 1 shows frequency of distribution according to the male and females. The mean age (SD) was 55.7 (13.9) years for men and 55.1 (13.5) years for women. In men, no BMS individual was found in the age groups 20 to 55 years, the entire patients with BMS in mans in the 55 to 80 year group with 0.3% frequency. In women, no BMS individual was found in the youngest age group, 20 to 44 years, and in the age group 45-60 and 60-80 prevalence was 0.4% and 0.5% respectively.

**Table 1.** Mean age of patients and age related burning mouth syndrome (BMS) prevalence

	Mean Age±SD	BMS Prevalence
Male	55.7 ± 13,86	0.2%
Female	55.1 ± 13,52	0.5%

SD: Standard deviation

After correction of etiological factors, 8 out of 12 (66.6%) patients with xerostomia, 1 out of 12 (8.3%) patients with candidal infection, 11 out of 12 (91.6%) patients with parafunctional habits, 1 out of

12 (8.3%) patients with oral galvanisms and 6 out of 12 (50%) patients with poor oral hygiene were free of burning symptoms. The use of removable prosthesis was found in 6 patients (50%), whom presented inadequacies in their dentures in 5 cases (83.3%) (Table 2)

**Table 2.** Factors associated with burning mouth syndrome symptoms in the study group

Xerostomia	8	66.6%
Candidal infection	1	8.3%
Parafunctional habits	11	91.6%
Oral galvanism	1	8.3%
Poor oral hygiene	6	50%
Removable prosthesis	6	50%

Cardiovascular problems and diabetes is the most common systemic disease which are seen in 4 (0.4%) and 5 (0.5%) patients respectively. Thyroid abnormalities, nutritional deficiencies and tumors were not noted any patient with BMS.

In the BMS group, 50% of the subjects had burning or pain sensation twice a week and 25% once a day and 25% less than half a day while no patients had all-day pain. Tongue and denture-bearing oral mucosa were burning sensation locations in most patients with 83% and 17% frequencies, respectively.

The most common medications used were anti-hypertensives and diabetics and none of the patients used anti-psychiatrics. None of the patients had received chemotherapy or radiotherapy, and seven (2 male, 5 female) of them smoked.

The mean duration of BMS was 3.8 years (range 8 months to 9 years) and the mean intensity, evaluated by mean (SD) VAS was 5.45 (1.69) (range 3 to 9 mm) and BMS type 3 was the most common type.

## DISCUSSION

Burning mouth syndrome is a chronic pain disorder characterized by a chief complaint of oral burning/pain with no clinically observable lesions in the involved oral mucosa.<sup>11</sup> The most commonly reported range has been 0.7% to 4.6%<sup>11</sup>, however, rates as high as 14.8% have also been estimated.<sup>18</sup> In present study we found 1.2% prevalence.

Bergdahl and Bergdahl<sup>12</sup> performed a questionnaire survey study regarding oral burning complaints in a group of 1427 randomly selected subjects (669 male and 758 female) from 48,500 Swedish individuals between the ages of 20 and 69 years. In their study they found 3.7% of patients with BMS. Between ages 30 to 39 and 60-69 prevalence was found 0.6% and 12.2% for women which was higher than our findings. In men, in the 40 to 49 year old age group they found 0.7% prevalence and 3.6% in the 60- 69-year old age. However in present study no BMS individual was found in the age groups 20 to 55 years and all of the patient with BMS in mans in the 55 to 80 year group with only 0.2% frequency which was significantly lower than study which was performed by Bergadhl.

Our 0.2% frequency shows consistency with Baharvand study that he was carried out a cross-sectional study on 650 patients, 269 men and 381 women attending to four dental schools in Tehran and found 1.3% prevalence.<sup>19</sup>

In the current study, the mean duration time was 3.8 year months, whereas in Hakeberg's study the duration time in 85% of patient's was more than 6 months, and in Lamy's study it was 2-5 years.<sup>16,20</sup>

In present study we found mean (SD) VAS score 5.45 ( $\pm$  1.69) which was higher previously studies reported by Bergdahl and Hakeberg 4.6 and 3.8, respectively.<sup>12,20</sup>

Several 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.<sup>9,10,21</sup> In present study the most common affected area tongue with 83% which was similar with studies conducted by Bergdahl<sup>12</sup> and Grushka<sup>10</sup> and higher than by Eguia Del Valle et al<sup>22</sup> reported that the tip of the tongue was the most common location (71%).

According to the classification proposed by Lamb et al, all of the patients shows type 3 BMS. Heidari et al in their study found that patient with BMS 50.6%, presented as type III, 25.8% revealed type II, and 23.6% demonstrated type I BMS.<sup>23</sup>

In this research xerostomia was found in 8 patients with 66.6% frequency which consistent with other investigation performed by Bergadhl. Brailo and Baharvand on BMS have been demonstrated

36% and 7.2% prevalence of xerostomia in patients, respectively<sup>23,24</sup> which was lower than our findings.

The intensity of the burning sensation in this study was 5.68% with a range from 3 to 9, on a visual analogue scale (VAS) graded from 0 to 10 which was higher than previous studies reported by Bergdahl and Hakeberg with a 4.6% and 3.8% frequencies, respectively.

Psychologic phenomena, such as alterations in states of anxiety and depression, somatization and certain aberrant personality traits, are common findings in patients who have BMS<sup>26,28</sup> At least one third of patients may have an underlying psychiatric diagnosis.<sup>29</sup> Many studies have shown that BMS patients suffer from various psychological problems.<sup>16,26,30</sup> In present study none of patient used psychiatric medications or history of visiting psychiatrist. However, 91.6% parafunctional habit frequency in BMS patients may be indicator of psychiatric. On the other hand visiting psychiatrist not to be accustomed in Turkish culture.

Allergic reactions or intolerance to various materials in BMS patient was reviewed in several publications.<sup>31,32</sup> These reviews indicate that burning mouth and metallic taste are by far the most frequent complaints studies. Furthermore, burning mouth was also indicated as a subjective adverse effect to acrylates which are used as a denture-base. A clinical study of 22 patients who suffered from burning syndrome revealed an allergy to MMA in five cases, as well as a high residual monomer concentration in their dentures. Three of these five patients were free of symptoms after they received new dentures with low residual monomer content.<sup>33</sup> In our study, 50% of patients were wearing denture-base prosthesis which will be indicator of this adverse effect. Interestingly, 16% of those patients who indicated complaints related to dental alloys revealed an alteration of the tongue, usually a fissured or geographic.<sup>31,32</sup> In present study oral galvanism was detected only 1 patient with BMS.

Burning mouth syndrome is a poorly understood chronic condition characterized by a burning sensation of the oral mucosa, usually without associated clinical or laboratory findings. There has been no clear consensus on the etiology, pathogenesis or treatment of burning and little information about the variations of BMS in the different popula-

tion in the world is available, and the same applies to its prevalence.

In conclusion, in present study BMS was found as 1.2% in frequency and the tongue was the most affected site. Burning mouth syndrome type 3 was the most common type. According to visual analogue scale the minimum and maximum levels of burning intensity were 3 and 9, respectively.

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