

## Oral burning symptoms and burning mouth syndrome-significance of different variables in 150 patients

Vlaho Brailo <sup>1</sup>, Vanja Vuèiaevia-Boras <sup>1</sup>, Iva Z. Alajbeg <sup>2</sup>, Ivan Alajbeg <sup>1</sup>, Josip Lukenda <sup>3</sup>, Marko Æurkovia <sup>1</sup>

(1) Department of Oral medicine, School of Dental Medicine, University of Zagreb

(2) Department of Prosthodontics, School of Dental Medicine, University of Zagreb

(3) Clinic for Cardiology, Hospital, Sv. Duh“, Zagreb, Sveti Duh 18. Croatia

*Correspondence:*

Dr. Vlaho Brailo

Department of Oral medicine

School of Dentistry

Gunduliæva 5

10000 Zagreb Croatia

E-mail: vbrailo@yahoo.com

Received: 15-10-2005

Accepted: 3-01-2006

**Indexed in:**

-Index Medicus / MEDLINE / PubMed  
-EMBASE, Excerpta Medica  
-Indice Médico Español  
-IBECs

Brailo V, Vuèiaevia-Boras V, Alajbeg IŽ, Alajbeg I, Lukenda J, Æurkovia M. Oral burning symptoms and burning mouth syndrome-significance of different variables in 150 patients. Med Oral Patol Oral Cir Bucal 2006;11:E252-5.

© Medicina Oral S. L. C.I.F. B 96689336 - ISSN 1698-6946

### ABSTRACT

**Objectives:** Despite the extensive amount of published literature upon burning symptoms in patients with clinically healthy appearance of the oral mucosa, as well as burning mouth syndrome (BMS) itself, they both remain still challenging topics.

The aim of this study was to determine the real prevalence of “true” BMS in comparison to other patients with burning symptoms with clinically healthy appearance of the oral mucosa and then to compare “true” BMS patients with healthy controls regarding gastritis and intake of anxiolytics and angiotensin converting enzyme inhibitors.

**Study design:** In 150 patients with burning symptoms of clinically healthy oral mucosa, local and systemic investigations were performed and they included detection of candidal infection, salivary flow rate, presence of oral galvanism and parafunctional habits as well as complete blood count, serum ferritin, serum glucose levels, serum antibodies to Helicobacter pylori together with detailed medical history with special regard to medication intake.

After “true” BMS patients were identified they have been compared to the controls with regard to the presence of gastritis and the intake of anxiolytics and angiotensin converting enzyme inhibitors.

**Results:** Our results show that gastritis were significantly more present among “true” BMS patients and that they also significantly more intake anxiolytics, when compared to the control group.

**Conclusions:** Our findings might lead to the conclusion that every “true” BMS patient should be referred to the gastroenterologist and psychiatrist.

**Key words:** Burning mouth syndrome, gastritis, anxiolytics.

## INTRODUCTION

It is well known that symptoms of burning in the oral tissues are concomitant to certain oral diseases. However, burning symptoms might occur when oral mucosa has clinically healthy appearance. Additionally, in some of these patients underlying local and systemic conditions which could lead to symptoms of burning might be found, such as candidal infection, xerostomia, oral galvanism, parafunctional habit such as tongue thrusting, psychological and neurological disturbances, diabetes mellitus, menopause, side effects of drug therapy and paraneoplastic syndrome (1-14). Finally, in patients where these clinical and laboratory findings are lacking, diagnosis of "true" burning mouth syndrome (BMS) is established and that all the other burning symptoms are due to a different pathologies representing with one symptom within the clinical spectrum of such a group of pathologies (15). The etiology of true BMS is still poorly understood, albeit extensive literature has been published in that area of the research. Recent studies have proposed neurological background and in the small group of patients with BMS, Lauria et al. (16) have identified trigeminal small-fiber sensory neuropathy. Bartoshuk et al. (17) has reported that interactions between taste and oral pain are responsible for BMS and that the intensity of the peak oral pain correlated with the density of fungiform papillae. Additional problem regarding BMS is lack of universally accepted definition based on the uniform criteria and sometimes even misunderstanding in the field of its terminology as Scala et al (15) concluded. Criteria for establishing a diagnosis of "true" BMS was presence of burning sensation on clinically healthy oral mucosa in the absence of all aforementioned known local and systemic etiological factors.

Therefore, the aim of this study was to determine the real prevalence of "true" BMS in comparison to other patients with burning symptoms with clinically healthy appearance of the oral mucosa and compare them to healthy controls regarding the presence of gastritis and the intake of anxiolytics and angiotensin converting enzyme inhibitors.

## MATERIAL AND METHODS

Prior to the investigation informed consent according to Helsinki II was obtained from each participant. Out of 1399 patients who were referred to the Department of Oral medicine in Zagreb during the year 2001, 150 had burning symptoms in clinically healthy oral mucosa. There were 123 women, age range 23 - 88, mean 64 years and 27 men, age range 30 - 77, mean 60.5 years. After detailed medical history was taken from each participant, thorough clinical examination of the oral cavity was performed. Smear for the detection of *Candida albicans* was taken from each participant with a cotton stick. The smear was placed on the Saboraud's agar into an incubator at the temperature of 37°C for 48 hours and then according to the number of colonies diagnosis of candidiasis was made according to Budtz-Jorgensen (18). Measurement of salivary flow rate

was done by use of simple spitting method into calibrated tubes during 5 minutes while participants were sitting according to Navazesh et al. (19). Values lower than 0.2 ml per minute were considered as an indicator of xerostomia. Oral galvanism (electrochemical potential between various metals in the oral cavity) was measured with a specially constructed device-digital voltmeter and values higher than 150 mV were considered as pathological (20). The presence of tongue thrusting habit was a sign of the parafunctional habit. Every patient underwent hematological screening for complete blood count with additional tests for blood glucose levels, serum ferritin and *Helicobacter pylori* antibodies. After all known local and systemic factors known to contribute to burning symptoms in clinically healthy oral mucosa were excluded, the diagnosis of "true" burning mouth syndrome was established in the remaining number of patients. Then they were compared to 80 sex and age matched controls recruited from the Department of Prosthodontics and free of any oral disease and burning symptoms, regarding gastritis and the intake of angiotensin converting enzyme inhibitors and anxiolytics. The statistical analysis was performed by use of Chi-Square test and p values ( $p < 0.05$ ) were considered as significant.

## RESULTS

Table 1. displays the results of clinical and laboratory testings conducted in the study group. Factors associated with burning symptoms and clinically healthy oral mucosa are shown. Local factors were detected as follows: xerostomia in 58 (38.6%) patients, clinically invisible candidiasis in 58 (38.6%) patients, parafunctional habits in 3 (2%) patients and oral galvanism in 7 (4.7%) patients, respectively. Systemic factors which might contribute to burning symptoms in clinically healthy oral mucosa were: *Helicobacter pylori* infection which was found in 19 (12.7%) patients, diabetes which was found in 20 (13.3%) patients, anemia which was found in 19 (12.7%) patients and neurological diseases such as Parkinson's disease and cerebrovascular insult which were found in 5 (3.3%) patients (Table 1).

**Table 1.** Factors associated with burning symptoms found in the study group (total of 150 patients with burning symptoms and healthy oral mucosa).

Xerostomia	58	38.6%
Candidal infection	58	38.6%
Parafunctional habits	3	2%
Oral galvanism	7	4.7%
<i>Helicobacter pylori</i> infection	19	12.7%
Diabetes	20	13.3%
Anemia	19	12.7%
Neurological diseases	5	3.3%
"True BMS"	76	50.7%

No significant difference between “true” BMS patients and controls regarding the intake of angiotensin converting enzyme inhibitors was found. Significant differences between “true BMS” patients and controls were found regarding gastritis and the intake of anxiolytics ( $p < 0.05$ ) (Table 2).

**Table 2.** Comparison between medication intake and gastritis in “true” BMS patients and controls.

	BMS patients (%)	Controls (%)
Angiotensin converting enzyme inhibitors	28.9	21.5
Anxiolytics	42.1*	16.3
Gastritis	51.3*	27.5

\*significant difference ( $p < 0.05$ )

## DISCUSSION

The percentage of patients with symptoms of burning was 9.8% out of all the other patients who attended our Department, albeit one has to bear in mind that our sample is not representative of the general population because they were part of the stratified group. However, after exclusion of patients with burning symptoms and healthy oral mucosa due to other causes, the number of “true” BMS patients was 5.4%. Bearing in mind that Croatia has 4 million inhabitants it seems that true prevalence of BMS is from 0.002% - 4% (based on the average assumption of epidemiological data which is 3-4 times more than real numbers) of the general population.

In almost half of the patients with burning mouth and clinically healthy oral mucosa at least two or more local or systemic factors which might lead to the burning symptoms were detected (Table 1).

After correction of etiological factors, 15 out of 58 (24.1%) patients with xerostomia, 27 out of 58 (46.5%) patients with candidal infection, 2 out of 3 (66.7%) patients with parafunctional habits, 3 out of 7 (42.8%) patients with oral galvanism, 15 out of 19 (79%) patients with *Helicobacter pylori* infection and 10 out of 19 (52.6%) patients with anemia were free of burning symptoms.

In 76 patients out of 150 (50.7%), the diagnosis of “true” burning mouth syndrome was established. The results of our survey suggest that the majority of patients with burning symptoms are women (82%), older than 60 years which is in concordance with previous findings of other authors (3, 5, 21, 22).

Then they were compared with 80 control group participants regarding the use of angiotensin converting enzyme inhibitors and anxiolytics. Bearing in mind the results of Lamey et al (23) who reported that BMS patients were 3.2 times more likely to have recurrent gastrointestinal problems than controls we also compared BMS patients with controls regarding the presence of gastritis.

In this study 22 out of 76 “true” BMS patients (28.9%) were taking angiotensin converting enzyme inhibitors and 32 out of 76 (42.1%) were taking anxiolytics (Table 2). Significant difference ( $p < 0.05$ ) was found between the two tested groups regarding the use of anxiolytics where 42.1% of “true” BMS patients were taking them in comparison to the 16.3% of the controls. This finding was also reported in other studies (22-24) where the intake of anxiolytics was much more frequent in “true” BMS patients. Higher proportion of psychological disorders, especially depression, in “true” BMS patients was reported by Palacios-Sanchez (3) and Soto Araya (7). We might hypothesize only that this finding might reflect either patients’ underlying anxiety or anxiety resulting from BMS, a dilemma always present in patients with chronic pain conditions.

Significant difference regarding the presence of gastritis in “true” BMS group (51.3%) compared to the 27.5% in the control group ( $p < 0.05$ ) was found (Table 2). That finding was previously reported in the literature by Basker et al. (25), Lamb et al. (26) and Dobrenic et al. (27). Maresky et al. (21) reported that special cognizance must be taken in patients with burning symptoms who suffer from hiatal hernia, reflux esophagitis and flatulence, although latter disturbances have not reached statistical significance in their study. However, at present it is not clear whether gastrointestinal disturbances are exclusion criteria for the establishment of “true” BMS diagnosis or they are just another somatic symptom of underlying emotional difficulties as suggested by Lamey et al. (23).

In patients with symptoms of burning in the oral cavity and clinically healthy oral mucosa, clinical examination of the oral cavity, candidal swab, oral galvanism measurement, salivary flow rate and parafunctional habit investigations should be performed. Additionally, hematological screening (with special attention to serum ferritin, blood glucose levels and *Helicobacter pylori* antibodies) should be performed to identify possible underlying disturbances. Detailed medical history should reveal any systemic factors which might result in symptoms of burning. Special emphasis should be addressed at infection with *Helicobacter pylori* due to very high percentage (79%) of patients whose burning symptoms resolved after eradication therapy.

Then if any of these known local and systemic causes could not be confirmed a diagnosis of “true” burning mouth syndrome should be established, unfortunately still without a proven cause and a limited therapeutic options. Due to the significant difference in anxiolytics intake between “true” BMS and controls, psychological examination and counselling should be offered to these patients. Additionally, due to the significantly higher prevalence of gastritis in patients with “true” BMS together with the reported incidence of 3.2 times more gastrointestinal symptoms in true BMS by Lamey et al. (21) we suggest that every patient with burning mouth should be referred to the gastroenterologist.

## REFERENCES

1. Silvestre FJ, Serrano C. Burning mouth syndrome: concepts review and update. *Med Oral* 1997;2:30-8.
2. Bergdahl J, Anneroth G, Anneroth I. Clinical study of patients with burning mouth. *Scand J Dent Res* 1994;102:299-305.
3. Palacios-Sanchez MF, Jordana-Comin X, Garcia-Sivoli CE. Burning mouth syndrome: a retrospective study of 140 cases in a sample of Catalan population. *Med Oral Patol Oral Cir Bucal* 2005;10:388-93.
4. Glass BJ. Drug-induced xerostomia as a cause of glossodynia. *Ear Nose Throat* 1989;68:776-81.
5. Soares MS, Chimenos-Kustner E, Subira-Pifarre C, Rodriguez de Rivera-Campillo ME, Lopez-Lopez J. Association of burning mouth syndrome with xerostomia and medicines. *Med Oral Patol Oral Cir Bucal* 2005;10:301-8.
6. Paterson AJ, Lamb AB, Clifford TJ, Lamey PJ. Burning mouth syndrome: the relationship between the HAD scale and parafunctional habits. *J Oral Pathol Med* 1995;24:289-92.
7. Soto Araya M, Rojas Alcayaga G, Esguep A. Association between psychological disorders and the presence of Oral lichen planus, Burning mouth syndrome and Recurrent aphthous stomatitis. *Med Oral* 2004;9:1-7.
8. Femiano F, Gombos F, Scully C. Burning Mouth Syndrome: open trial of psychotherapy alone, medication with alpha-lipoic acid (thioctic acid), and combination therapy. *Med Oral* 2004;9:8-13.
9. Bergdahl M, Bergdahl J. Burning mouth syndrome: prevalence and associated factors. *J Oral Pathol Med* 1999;28:350-4.
10. Brown RS, Krakow AM, Douglas T, Choksi SK. Scalded mouth syndrome-caused by angiotensin converting enzyme inhibitors. *Oral Surg Oral Med Oral Pathol* 1997;83:665-7.
11. Bogduk N. An anatomical basis for neck-tongue syndrome. *J Neurology Neurosurgery Psychiatry* 1981;44:202-8.
12. Wambach G, Engelskirchen R, Saborowski F. Therapieresistentes Zungenbrennen als Frühsymptom eines kleinzelligen Bronchialkarzinoms. *Med Welt* 1979;30:993-5.
13. Ferguson JW, Burton JF. Clinical presentation of acoustic nerve neuroma in the oral and maxillofacial region. *Oral Surg Oral Med Oral Pathol* 1990;69:672-5.
14. Alajbeg I, Vučićević-Boras V. Burning mouth syndrome: etiopathogenesis, diagnosis and therapy. *Liječ Vjesnik* 2002;124:220-4.
15. Scala A, Checchi L, Montecchi M, Marini I, Giamberardino MA. Update on burning mouth syndrome: overview and patient management. *Crit Rev Oral Biol Med* 2003;14:275-91.
16. Lauria G, Majorana A, Borgna M, Lombardi R, Penza P, Padovani A, et al. Trigeminal small-fiber sensory neuropathy causes burning mouth syndrome. *Pain* 2005;115:332-7.
17. Bartoshuk LM, Snyder DJ, Grushka M, Berger AM, Duffy VB, Kveton JF. Taste damage: previously unsuspected consequences. *Chem Senses* 2005;30:218-9.
18. Budtz-Jorgensen E, Stenderup A, Grabowski M. An epidemiologic study of yeasts in elderly denture wearers. *Community Dent Oral Epidemiol* 1975;3:115-9.
19. Navazesh M, Christensen CM. A comparison of whole mouth resting and stimulated salivary measurement procedures. *J Dent Res* 1982;61: 1158-62.
20. Kraljevic K, Cekic-Arambašin A, Grabarevic S. The study of galvanic currents and oral pathologic alternations and symptoms in the mouth. *Acta Stomatol Croat* 1986;20(suppl 1):67-74.
21. Maresky LS, van der Bijl P, Gird I. Burning mouth syndrome. *Oral Surg Oral Med Oral Pathol* 1993;75:303-7.
22. Vucicevic-Boras V, Topic B, Cekic-Arambašin A, Zadro R, Stavljenic-Rukavina A. Lack of association between burning mouth syndrome and hematinic deficiencies. *Eur J Med Res* 2001;6:409-12.
23. Lamey PJ, Freeman R, Eddie SA, Pankhurst C, Rees T. Vulnerability and presenting symptoms in burning mouth syndrome. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2005;99:48-54.
24. Hakeberg M, Berggren U, Hagglin C, Ahlquist M. Reported burning mouth symptoms among middle-aged and elderly women. *Eur J Oral Sci* 1997;105:539-43.
25. Basker RM, Sturdee DW, Davenport JC. Patients with burning mouth. A clinical investigation of causative factors including the climacteric and diabetes. *Br Dent J* 1978;145:9-16.
26. Lamb AB, Lamey PJ, Reeve PE. Burning mouth syndrome: psychological aspects. *Br Dent J* 1988;165:256.
27. Dobrenic M, Vidas I, Mravak M. Upon significance of various factor in the etiology of burning mouth syndrome. *Acta Stomatol Croat* 1985; 19:41-6.