ORAL COMPLAINTS AND SPEECH ASSESSMENT OF INDIVIDUALS WITH BURNING MOUTH SYNDROME

Queixas orais e verificação da fala de indivíduos com síndrome da ardência bucal

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ABSTRACT

Purpose: to identify complaints concerning the oral functions related to the symptom of burning mouth and verify changes in speech articulation. **Method**: 22 individuals age range 44-78 years old diagnosed in the Stomatology Clinic of the State University of Rio de Janeiro. A survey with a specific questionnaire and an audiovisual recording of the subjects' speech using a pre-set list of words were performed. **Results**: 77% individuals reported specific symptoms of burning sensation and 23% reported symptoms in association with soreness. 86% individuals reported symptoms associated with dry mouth, taste and smell change. 82% individuals reported burning sensation in the tongue as the most impaired area. The intensity of the burning sensation was reported as moderate by 64%. The symptoms were described as constant by 64% individuals. 82% individuals reported using strategies to minimize the symptom of the burning sensation. Regarding the oral functions, 27% complained of fatigue when speaking, 14% of fatigue during mastication, and 9% choking when swallowing. 32% individuals reported increased intensity of the burning sensation when speaking, and 9% during mastication. Speech analysis did not show any alteration in 95% of the sample, and articulation inaccuracy of speech was found in 5% of the individuals evaluated. **Conclusion**: the research revealed oral complaints such as fatigue while speaking or chewing and increased burning sensation while performing those functions, however no changes in speech articulation were found in individuals with Burning Mouth Syndrome.

KEYWORDS: Burning Mouth Syndrome; Speech; Phonetics

INTRODUCTION

The stomatognathic system performs the functions of breathing, mastication, suction, swallowing and speech. Any change in one or more functions of this system may cause patterns that differ from normality. Adequately performed oral functions bring perfect balance to the system as a whole, and this defines an individual's quality of life. Therefore, illnesses affecting the oral cavity may, to a higher or lower degree, bring discomfort and/or cause modifications in the oral functions.

Speech is one of the critical functions responsible for an individual's interaction with and integration to society. Any functional, neurological or structural changes preventing or hindering the articulatory movements may cause a differentiated pattern in the person's speech. On the topic of speech alterations associated with structural alterations, specific patterns of speech can be observed in individuals with skeletal disproportions. Such disharmony causes changes in the articulation of

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Conflict of interest: non-existent

certain phonemes due to the subject's structural conditions [1]. Also significant loss of dental elements can lead to relevant alterations in the oral functions. Likewise, dental prosthesis can bring significant harm to speech, especially during the initial adaptive phase [2]. As well, open bites, which cause alteration of speech due to the interposition of the tongue between the dental arches [3], are an instance of phonetic disorder. Additionally, the use of dental braces to fix malocclusions can cause articulatory alterations [4]. Dysfunctions in the temporomandibular joint, when associated to pain, can also impair the oral functions of speech and mastication [5-7].

Although all oral structures may appear intact, still individuals can report complaints such as burning mouth symptoms, which may cause change in one or more functions of the stomatognathic system and which, depending on its intensity, may have a negative impact on those functions. This may not only have a specific effect on the individual's eating behavior, but also cause significant damage to the functions of mastication and speech.

Burning Mouth Syndrome (BMS) is an illness characterized by blazing and/or constant unrelieved soreness in the mouth without any association with injuries in the oral cavity. It prevails in female and elderly individuals [8-15], and is more frequent among middle-aged individuals [10,15-17].

The intensity of the burning or blazing sensation may vary [18], and it increases along the day [19,20]. Frequently the blazing sensation occurs in more than one area of the mouth [11,13,14,20]. The tongue is reported as the structure most affected by this symptom [12-15,19-24], which may also distress other areas of the oral cavity, such as lips, palate [20], gums and buccal mucosa [13,16,24] – and less frequently the floor of the mouth [13,14] and the oropharynx [12]. The term "syndrome" is used because BMS is described as a burning sensation in the mouth in association with other subjective symptoms, such as xerostomia – a dry mouth sensation – and dysgeusia – taste change [12,14,15,22-27].

Due to its puzzling condition, BSM etiology is considered multifactorial. Like those of a systemic origin, which are explained by alterations in the salivary glands, or due to endocrine, pharmacological, neurological and nutritional disorders; and like those with a local onset, including dental, allergenic and infectious etiologies; etiologies with a psychogenic base usually result in depression and anxiety; and those with an idiopathic origin have no specific cause is established [18,25,28,29]. As the sensitivity of the oral cavity is affected, recent studies have related BMS to a neuropathic basis as a result of disorders affecting the neural pathways [27,30-32].

Different BMS symptoms are reported by patients, who usually describe them as burning, soreness, blazing, numbness [13,20], itching, tingling [21], foreign body [9], flames, spice [33], swelling and scalded mouth sensation [34]. Xerostomia is among the associated symptoms most frequently reported by BMS patients [14,20,24,26,34]. Dysgeusia (change of taste) is another common complaint by individuals with BMS [15,22,25,26]. Studies say that the latter symptom is reported by subjects as a ghost [15], bitter or metallic [13,20] taste, or by the impairment of the gustatory function [27]. The intensity of the symptoms is described as moderate [19,22] to severe [17,35]. The symptom of burning sensation is described as constant [34,36] or intermittent [23,34], with moments of higher intensity [8,19]; one study [21] describes the variety of the aforementioned symptoms.

Complaints regarding the oral functions are reported as follows: aggravation of symptoms when speaking and eating either hot [37], or acidic [30], or spicy [22,36] food; alleviation or disappearance of symptoms after food or liquid intake [19,36]; relief of symptoms when eating cold food [30]; and either aggravation or alleviation of symptoms when drinking liquids or eating foods at extreme temperatures [12]. Individuals report change in eating habits as the symptoms interfere with their social lives and oral functions [22]. Because BMS causes chronic pain and compromises structures of the oral cavity, in association with various symptoms that have a negative impact on the day-to-day lives of those subjects, patients feel psychologically distressed, which interferes with their quality of life [17,33,38,39].

Literature review did not find either a standardized protocol, or studies on orofacial myofunctional assessment for identification of complaints regarding oral functions and alteration of speech in patients with complaint of burning mouth. Therefore, aiming at contributing with a better understanding of the clinical and functional speech assessment of individuals with BMS, the present study focused on identifying complaints specifically related to oral functions and associated with both burning mouth symptoms and phonetic change. In other words, it aims at finding whether burning mouth symptoms cause distortions in the speech of individuals with BMS.

METHOD

This research was carried out after both the fulfillment of the required ethical procedures, and the evaluation and approval, under the nº 2856/2011, of the Committee of Ethics in Research of the Pedro Ernesto Hospital of the State University of Rio de

Janeiro (UERJ); it was regarded as offering no risk and requiring a Free Prior and Informed Consent.

This research assessed 22 patients of the Piquet Carneiro Polyclinic of the State University of Rio de Janeiro (UERJ), who had been referred to a Speech Therapist's evaluation by healthcare professionals in the Stomatology Center of the School of Dentistry after a diagnosis of burning mouth.

Exclusion criteria were: neurological and/or cognitive impairment; congenital, acquired or evolving neurological diseases; hearing impairment; speech disfluency; any syndromes associated with dentofacial deformities or with temporomandibular joint disorders; injuries in the oral cavity; use of dental braces; pierced oral structures; edentulism without denture wearing; and unstable removable dental prosthesis.

All participants were aware of the goals and procedures of the research, and only those who freely agreed to sign the Free Prior and Informed Consent were accounted for as research subjects.

Each patient met up with the researcher individually, indoors, in a private environment, at an appointed time. All were interviewed and evaluated by a dental surgeon and a speech therapist – authors of this research.

Firstly, each individual was examined by the dental surgeon, who checked the stability of the dental prosthesis, regarding as unsatisfactory those that moved while speaking, and checked for any injuries in the oral mucosa. Then, the patient was referred to speech assessment. Here, each individual answered an identification data questionnaire with: their name, age and gender; the clinical history of symptoms, including time of onset of symptoms; specific and associated symptoms; location of the burning sensation; intensity of the burning sensation, which was measured using a visual analogical scale, graded from 0 to 10 (0=none; 10=worst); variation of the intensity of symptoms along the day – whether in the morning, afternoon or evening; form of symptoms, whether constant or intermittent; strategies (if and what) used to relieve the symptom of burning sensation; identification of complaints about the oral functions as a consequence of the the symptom of burning sensation; and whether oral functions improved or were impaired due to the burning mouth symptoms.

Then an inspection of the oral cavity was carried out, in order to check the integrity of all oral structures involved in speech, including dental status, type of bite, conditions of the tongue, lips, cheeks and tonsils. For this procedure, disposable wooden tongue depressors and disposable gloves were used. Recording of speech was carried out only after the aforementioned steps were completed.

After patients were clarified as to the procedures of the speech assessment, they were given a headset with an adjustable microphone and fitted it to their heads. Each patient was sitting straight, in order to facilitate the viewing of the pictures. The audio recording and film shooting took place simultaneously. The film shooting was performed so as to verify and further analyze individuals' speech articulation. The audio recording of patient's speech consisted of patients' saying aloud their name and age, and identifying 87 pictures from a pre-set list of words. Speech protocol included the transcript of the words presented in the pictures; this pre-set list contained all the phones existing in Brazilian Portuguese. In order to facilitate the measurement of the results, each word was assigned two scores: (0) for normal pronunciation, and (1) for phonetic change. Any alteration in the speech that resulted in distorted and/or inaccurate articulation of the phones produced by the subject was considered a phonetic error. Both the questionnaire and the speech protocol used in the research were designed by two speech therapists, authors of this research, for the Professional Master's Program of Veiga de Almeida University in Rio de Janeiro. Each recorded speech was separately analyzed by two speech therapists, authors of this research. In case there was a disagreement as to the scores granted to a subject, a third speech therapist would evaluate the speech records in order to find an agreement.

This is a cross-sectional, exploratory, descriptive and quantitative study. The results were organized and analyzed by means of descriptive statistics, and expressed in percentage data (%).

RESULTS

The research was carried out with 20 female and 2 male individuals, age range 44-78 years and mean age 60,4 years; 13 were elderly individuals, age range 60-78 years. Out of the total analysis sample, 20 individuals (91%) used stable dental prosthesis, either total or partial; 2 individuals (9%) had full dentition. Time of disease progression ranged from 1 to 15 years.

Specific burning sensation symptoms were reported by 17 (77%) individuals, whereas burning sensation associated with soreness was reported by 5 (23%) individuals.

Association of other symptoms with burning mouth was reported by 19 (86%) individuals, thus distributed: 41% dry mouth; 23% dry mouth associated with taste change; 9% dry mouth, taste and smell change; 9 % associated taste and smell change; and 5% taste change.

Patients reporting structures affected by a burning sensation, in order of impairment, were: the tongue, reported by 18 (82%) individuals; the lips, 9 (41%) individuals; the palate, 7 (32%) individuals; buccal mucosa, 4 (18%) individuals; the gums, 4 (18%) individuals; and the floor of the mouth, reported by 1 (5%) individual.

Specific characteristics of the symptom of burning sensation were identified in this sample. Intensity of the burning sensation was described as moderate by 14 (64%) subjects, severe by 6 (27 %) subjects, and mild by 2 (9%) subjects. The form of the symptom of burning sensation was said to be constant by 14 (64%) individuals, and intermittent by 8 (36%) individuals. Periods of intensification of the symptoms were reported by 17 (77%).

From the total sample 18 (82%) individuals said they use one or more strategies to minimize the burning sensation: drinking cold water was reported by 11 (50%) subjects; eating food, by 5 (23%), and sweets, by 4 (18%) subjects; seeking some distraction was reported by 4 (18%) individuals; sucking on ice, by 2 (9%); taking medication, by 2 (9%); doing mouthwash, by 1 (5%), and stopping speaking by 1 (5%) individual.

As to oral functions, 7 (32%) – among whom 3 elderly – individuals complained about 1 to 3 symptoms. Fatigue when speaking was reported by 6 (27%) individuals, 4 of them aged 44-56 years, and 2 aged 63-78 years. Fatigue during mastication was reported by 3 (14%) subjects, 2 of whom were the same elderly individuals who reported fatigue when speaking. Regarding the function of swallowing, choking was reported by 2 (9%) individuals above 60 years of age, one of them also complained about fatigue when speaking and during mastication.

As regards the impact of oral functions on the burning mouth symptom, 7 (32%) individuals reported increased intensity of the burning sensation when speaking, and 2 (9%) individuals reported worsening of symptoms during mastication.

Analysis of speech showed that 21 (95%) individuals were considered normal, which means no distortions or inaccuracy was found in their speech. Only 1 (5%) individual, aged 49 years, showed articulatory inaccuracy with reduced mouth opening during speech; this subject also complained of fatigue when speaking.

All results are shown in Table 1.

DISCUSSION

An individual's physical, mental and social integrity directly affects their quality of life. When it comes to oral functions, the integrity of each and all structures of the oral system leads to a perfect balance. Any change that causes an imbalance in this system may compromise, to a higher or lower degree, the functions of speech, mastication or swallowing [1-7]. Speech, as a function for communication, has a relevant role, once it promotes an individual's interaction with and integration to their social environment.

Many studies refer to the impairment of oral functions in individuals with Burning Mouth Syndrome [12,19,22,30,36]. However, it is not clear how the patients' complaints reported in those studies actually translate as an impairment of the function of speech. The reviewed studies did report any investigation of specific changes of the function of speech in individuals with Burning Mouth Syndrome. Thus, the present research, by means of a specific questionnaire, aimed at analyzing complaints in the oral functions associated with the symptom of burning sensation and investigating, by means of audiovisual recording, any changes in the speech that might be caused by such symptom in patients diagnosed with Burning Mouth Syndrome.

In agreement with the literature, this research found a prevalence of female individuals in the research sample [8-17]. Mean age also confirms the literature: BMS affects individuals in this age group. The occurrence of the disease among female and elderly individuals may be justified by a number of factors, from systemic diseases, such as diabetes, to hormonal changes, such as menopause, to the use of medications used by the aged population [8,10,15-17].

As to specific symptoms, soreness associated to the burning sensation was reported by a low percentage of the sample, which agrees with prior studies [13,21]. Literature refers to BMS as a condition of painful blazing sensation [32] and states that such symptom may appear in association with the clinical condition of burning mouth [14,17]. As to the associated symptoms, the research showed a considerable percentage of individuals with complaints of dry mouth, followed by taste change and, at a lower percentage, smell change. Complaints of dry mouth are commonly associated with BMS [15,23,24,26,34]. Studies corroborate the link between dysgeusia and burning mouth confirmed by neural dysfunction, impairment of the gustatory function and of the thermal sensitivity of the oral mucosa [27,30,31]. Those findings seem to confirm the condition of syndrome, which is formed by the triad of symptoms – to wit, burning sensation, xerostomia and dysgeusia – found in the literature [18,25].

The tongue was reported as the structure most affected by the symptom of burning sensation, which agrees with former studies; other structures are reported in a lesser proportion [12-16,19-24]. In agreement with other studies [19,22], most individuals

Table 1 – Questionnaire and speech assessment data

Sample general data	N	%
Gender		
Female	20	91
Male	2	9
Specific symptoms		
Burning sensation	17	77
Burning sensation and soreness	5	23
Associated symptoms	19	86
Dry mouth	9	41
Dry mouth and taste change	5	23
Dry mouth / taste and smell change	2	9
Taste and smell change	2	9
Taste change	1	5
Location of the symptom of burning sensation		
Tongue	18	82
Lips	9	41
Palate	7	32
Buccal mucosa	4	18
Gums	4	18
Floor of the mouth	1	5
Intensity of the symptom of burning sensation		
Mild	2	9
Moderate	14	64
Severe	6	27
Form of the symptom of burning sensation		
Constant	14	64
Intermittent	8	36
Periods of intensification of symptoms	17	77
Use of strategies to relieve the symptom	18	82
Drink cold water	11	50
Eat food	5	23
Eat sweets	4	18
Seek distraction	4	18
Suck on ice	2	9
Take medication	2	9
Do mouth-washing	1	5
Stop speaking	1	5
Complaints associated to oral functions due to the symptom of burning sensation		
Fatigue when speaking	6	27
Tiredness during mastication	3	14
Choking when swallowing	2	9
Impact of the oral functions on the symptom of burning sensation		
Increased intensity of the symptom when speaking	7	32
Increased intensity of the symptom during mastication	2	9
Speech analysis		
Altered speech articulation	1	5
Unaltered speech articulation	21	95

reported moderate intensity of the symptom, which was measured by means of a visual analogical scale. The form of occurrence was reported as constant by most individuals, which was also observed in prior studies [21,34,36]. Individuals also reported periods of intensification of the symptoms, a recurrent data in previous studies [19,20]. Studies relate the increase in the intensity of the symptom as a worsening factor to interpersonal conflicts, stress and psychological distress [8,12,22,33].

Subjects reported the use of strategies to minimize the symptoms in order to cope with the discomfort of the burning sensation, which agrees with data found in the reviewed literature [19,30,33,36]. In this study, 82% (18) subjects used one or more strategies; the most frequently reported strategy was the intake of cold water – 50% (11) of the sample –, followed by eating food – 23% (5) subjects. The fact that BMS has multifactorial causes and requires a variety of treatments [25,28,29,37], which in many cases do not show effective results [24], seems to justify the use of those strategies by patients.

Patients reported complaints specific to oral functions, such as tiredness when speaking and during mastication, as well as choking when swallowing. Though relevant, such complaints were referred at a lower percentage and may be more closely related to ageing or other factors [2,5-7], than properly to burning mouth symptoms. Former studies reported complaints of fatigue in individuals with burning mouth symptoms [37,39]. Nevertheless, no clear explanation of such complaint was offered, since BMS has multifactorial causes, among which systemic diseases [12,15,17,34], and shows higher incidence among middle-aged and elderly individuals [10,15-17,21].

The low percentage of complaints referring to the function of mastication may be explained by the fact not only that individuals with burning mouth symptoms report complaints of their eating habits [12,22,30,36], once the flavor and/or temperature of the food may influence their eating behavior, but also they already make use of strategies – such as the intake of water and food, among others – to relieve the symptom [19,30,36], which was also found in this study.

Another explanation for those findings is the low occurrence of the symptom of soreness in this study. The presence of soreness could be an aggravating factor causing significant harm to the oral functions. As to speech and mastication, the literature confirms that the involvement of the symptom of soreness, conditional to its intensity and gravity, may compromise the effectiveness of the oral functions [5-7]. As to the strategies used for relief of burning mouth symptoms, only one individual in this study reported having stopped speaking; this same individual is among those who reported soreness of the tongue as a specific symptom associated to burning mouth, which justifies the impairment of the function of speech.

Speech analysis showed that 95% of the sample (21 individuals) did not show any evidence of phonetic change. Yet, speech distortions or inaccuracy were expected, once, according to the literature, speech is compromised by the aggravation of the symptom [37]. In this study 32% (7) subjects said that burning mouth symptoms increase when they speak, which might lead to deducing that individuals with burning mouth symptoms would avoid moving their tongues, which is the oral structure mentioned as the most affected by the symptom of burning sensation – 82% (18) of the sample. Furthermore, the severe intensity of the symptom might lead to a restraint in the articulatory movement of the tongue, which might result in distortions of speech, not found in this study. Only 1 individual (5%) showed altered speech with articulatory inaccuracy; the same individual complained of tiredness when speaking. This may be associated to factors other than burning mouth symptoms, such as temporomandibular disorders [5-7].

Future studies, with larger samples, are required for a better identification of those complaints. Individuals with BMS must be assessed based on their complaints involving oral functions, depending on the impairment of the individual's oral structures and on the association of those complaints with many other symptoms, especially if soreness is reported, which may cause relevant harm to the functions of speech, mastication and swallowing, significantly impacting the subject's quality of life.

CONCLUSION

This research found specific complaints reported by individuals with Burning Mouth Syndrome as to their oral functions, namely those involving speech, mastication and swallowing. Tiredness when speaking was the most commonly referred complaint, followed by tiredness during mastication. Individuals also reported increased intensity of the symptom of burning sensation when speaking to a greater proportion than an increase of the symptoms during mastication. Speech analysis did not show any changes of speech articulation that might characterize phonetically the speech of individuals with BMS.

RESUMO

Objetivos: identificar queixas referentes às funções orais relacionadas ao sintoma de ardência bucal e verificar alterações na articulação da fala **Método:** participaram do estudo 22 indivíduos com faixa etária entre 44 a 78 anos, diagnosticados na Clínica de Estomatologia da Universidade do Estado do Rio de Janeiro. Foi realizado levantamento dos dados a partir de questionário específico e gravação audiovisual da fala utilizando fichário evocativo. **Resultados**: foram relatados sintomas específicos de ardência por 77% dos sujeitos e em associação com dor por 23%. Sintomas associados como boca seca, alteração do paladar e olfato foram referidos por 86% dos indivíduos. A língua foi referida com sintoma de ardência em 82% dos indivíduos, representando a estrutura mais acometida. A intensidade da ardência foi referida como moderada por 64%. A forma de ocorrência do sintoma foi relatada como contínua por 64% dos indivíduos. Do total, 82% relataram fazer uso de estratégias para minimizar o sintoma da ardência. Em relação às funções orais, 27% queixaram-se de cansaço na fala, 14% de cansaço na mastigação e 9% de engasgos à deglutição, sendo que de 32% relataram aumento da intensidade da ardência na fala e 9% na mastigação. Na análise de fala, em 95% da amostra, não houve ocorrência de alteração, sendo a imprecisão articulatória identificada em 5% dos indivíduos avaliados. **Conclusão:** foram identificadas queixas orais como cansaço ao falar e mastigar e aumento da intensidade do sintoma de ardência nestas funções, não tendo sido evidenciadas modificações na articulação da fala nos indivíduos com Síndrome da Ardência Bucal investigados nessa pesquisa.

DESCRITORES: Síndrome da Ardência Bucal; Fala; Fonética

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Received on: September 03, 2012
Approved on: March 19, 2013

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