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EVALUATION OF MULTIPLE ETIOLOGIC FACTORS RELATED TO BURNING MOUTH SYNDROME

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ABSTRACT

This study was designed to evaluate the etiologic factors of Burning mouth syndrome and explore its characteristics with the specific outcome of increasing awareness of the condition as well as the pathogenesis. The study was performed on (60) patients of both sexes and different ages, from those (30) patients as a Group (A)were included which had a chief complaint of burning sensation and the remaining (30) patients were chosen free from any kind of pain or disease were considered as a Control Normal Group (B). All of these patients were evaluated by means of questionnaire, thorough Clinical Intra and Extra oral examinations and Salivary flow measurements were taken by schirmer tear strip test. The correlation between statistical analysis of both Groups (A&B) assured the findings of this study that Age-adjusted incidence was higher in women than Men as well as the Postmenopausal women was the highest disease incidence. Also; other factors as (tobacco, oral lesion, stress, problems with dentition, some food allergy) can be accelerated to severe conditions.

KEY WORDS: Burning mouth syndrome, Diagnosis, Treatment, Etiology salivary flow measurements, Orofacial pain.

INTRODUCTION

Burning Mouth Syndrome (BMS) refers to a chronic orofacial pain disorder usually unaccompanied by mucosal lesions or other clinical signs of organic disease. BMS has been referred to as glossopyrosis, oral dysesthesia, sore tongue, stomatopyrosis, and stomatodynia. [11,14,20]

Because tongue is the main headquarters of the location of pain in most patients

Para functional habits of tongue or some tics (previous interposition of the tongue, bruxism, clenching of teeth etc.). Immunological etiology is also relevant. Food antigens as ascorbic acid, cinnamon, nicotinic acid, propylene glycol and benzoic acid as well as allergens such as dental alloys zinc, cobalt, mercury, gold, palladium, or sodium lauryl sulfate (a detergent contained in the dentifrice) are incriminated in the development of BMS. [17,28,29] (Brufau-Redondo C& et;al in 2008 and Grushka et al.,

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2006 stated that BMS is typically characterized by a continuous, spontaneous and often intense burning sensation as if the mouth or tongue were scalded or on fire, being the tongue the most affected structure, xerostomia and taste aberrations but other oral and systemic manifestations can also occur although the symptoms may seem definite and careful diagnosis are necessary to avoid mistaking BMS with other orofacial pain problems, such as atypical odontalgia, temporomandibular disorder and other sensory dysesthesia.[3,6,7,12].

BMS can be classified according to its etiology, as primary and secondary. Primary BMS is an idiopathic condition but Secondary BMS that can potentially arise from various local or systemic abnormalities such as nutritional deficiencies, hormonal changes associated with menopause, local oral infections, xerostomia, hypersensitivity reactions, medications and systemic diseases including diabetes mellitus.[27,29]

Among the local inducers of BMS there are also mechanical damages caused by the use of inappropriate dentures which can produce micro traumatisms or local erythema,also restrict normal activity of tongue muscles[19]. Connective tissue autoimmune diseases (Sjögren's syndrome and systemic lupus erythematosus) are also associated with BMS. Oral infections caused by various microorganisms have been associated with the BMS, particularly Candida albicans. Other oral infections caused by bacteria such as Enterobacter, Klebsiela, Fusobacterium and Staphylococcus aureus were found with high frequency in patients with such symptoms.. [15,17]

Schiavone et al., 2012; reported that Patients with BMS present varying degrees of anxiety and depression that can affect the perception and severity of pain; However, it is not clear if this is a result of having the condition or factor causing it. It is important to note that the diagnosis of BMS should be established only after all other possible causes have been ruled out. [24,33]

Clinical diagnosis relies on careful history taking, physical examination and laboratory analysis; however, professional delay in diagnosing, referring and appropriately managing of BMS patients occurs frequently due to the complexity of the condition. [21,26,32] (Zakrzewska et al., 2005)[36] concluded that the Treatment is aimed to correct underlying medical conditions that are causing BMS (local or systemic), supportive therapy and behavioral feedback. Currently systemic treatment modalities include antidepressants, cognitive behavioral therapy, analgesics, hormone replacement therapy, alpha-lipoid acid and anticonvulsants [1,4,13]. Treatment should be tailored to each patient and it is recommended that it is done in a multidisciplinary facility [6, 30].

The purpose of this study is to evaluate the prevalence of BMS in outpatients clinic in RAK Dental students clinic and explore the characteristics of BMS with the specific outcome of increasing awareness of the condition and the etiology and pathogenesis of BMS.

MATERIALS AND METHODS

Diagnostic Criteria

Clinical diagnosis relies on a detailed review of patient's medical and dental histories, allergic reaction and a careful analysis of data obtained from physical and laboratory investigations. The diagnosis of BMS needs a careful analysis of the symptom pattern experienced by each patient. The main symptoms of oral burning or pain should be experienced deep within the oral mucosa, unremitting for at least 4-6 months and continuous thought almost all the day. Moreover, the oral burning or pain seldom interferes with sleep and never worsens, but may be relieved, by eating and drinking. Other oral symptoms such as dysgeusia and xerostomia and the presence of sensory /chemo-sensory anomalies, mood changes, and specific disruptions in patient personality traits may also help identify the BMS. In addition, Patients with BMS cannot have any signs

of oral mucosal pathology. Detailed Medical history was taken to reveal any systemic factors which might result in symptoms of burning. (Andy &et., al 2013)*[1,2]

Patients Selection and Grouping

Group (A):

The present study was performed as a cross-sectional analytical study on Thirty (30) patients were selected as a Group (A) from outpatients Clinic in RAKCODS of both sexes and range of ages (30-70) with a chief complain mainly related to the tongue surface of Burning sensation or pain in the mouth with no observable oral mucosal lesion which was considered as Burning Mouth Syndrome (BMS). Patients were subjected to through accurate diagnosis intraorally and extra orally for detection of the main aetiology about the burning characteristics, including location, duration and previous management, and were examined for any oral lesions for exact diagnosis of BMS. Also,Candidal swab, oral galvanism measurements and para functional habit investigations were performed in some cases.

The severity of mouth burning or pain was determined by a pain assessment (Level of pain scale), in which 0 demonstrates no pain and the 10 shows severe pain.

Group (B): ***(Control Group)***

Thirty (30) patients were considered as a Control Group which completely free from any pain, complains, with clinically healthy oral mucosa and completely free from any kind of systemic diseases or allergic reaction.

All the patients signed an informed consent form before being included in the study.

All Groups (A&B)subjected to salivary function and flow test. We used sticks to which are more accurate than ordinary litmus paper with a chart giving increment of 25 points., and also calibrated to the limits of the Human body PH.

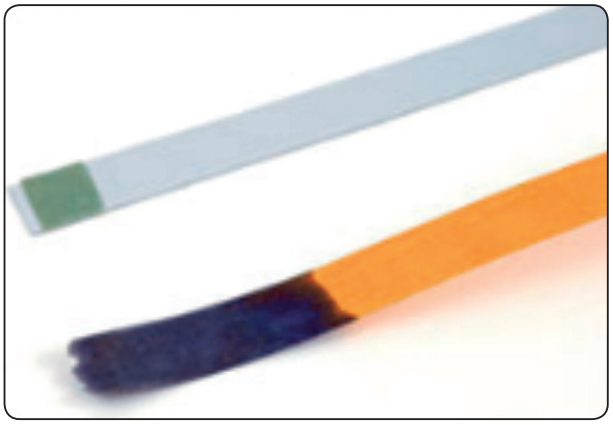

Fig. (1) Showing Salivary function Test.

Statistical analysis was carried out using Excel software. The baseline data, including sex, age, Medical problems, dental history,extraoral and intraoral examination, pain assessment, salivary flow test and allergic assessment were using t-test and chi-square test) to compare between both Groups (A&B).

RESULTS

In total, 30 cases (Group A) were identified, representing an annual age and sex adjusted incidence of BMS. Age-adjusted incidence was significantly higher in women than men. Also; Postmenopausal women aged (50 to 70) years had the highest disease incidence, with the maximal rate in women aged (55 to 61 years). After age 50 years, BMS incidence in men and women significantly increased across age-groups. BMS usually presents 3 years before to 12 years following menopause and rarely before the age of 30.

The overall age- and sex-adjusted incidence of BMS. The incidence of BMS in women exceeded the rate in men. The highest incidence rate was in women aged 50 through 72 years, the highest incidence in men was also in the age-group 50 to 72 years. After age 50 years, the BMS incidence in

both men and women increased across age-groups No significant difference was found between the sexes in this increase Age of BMs patients around 37 to 61 years old.

In medical problem related to burning mouth syndrome, BMS groups highly significant (p=1.15) affected in social history (especially smoking) as most of group prefer smoking. Also there is a high significant (p=0.002) patients with dry mouth and TMJ problems (medical problems).

A complete routine intraoral and extra oral examination was performed. Nothing abnormalities found in extra oral examination. Patients with bone resorption have highly significant (p=4.13) different between other intraoral feature. As most of patient have loose of teeth which causes these resorption. Also Fissure tongue was highly significant (p=1.038) in BMs patients. Others features (dentures stomatitis, candidiasis, white lesion, bluish mucosa) were found on examination in some cases.

A comparison was performed between BMS and Control (Groups A&B) in Dental History. The results revealed a highly significant (p=0.00) difference in headache or neck ache, Food trapping between teeth, staining in teeth, problem with previous dental treatment and loose teeth between both groups.

Intensity of pain was abstracted from either a 0-to-10 numeric pain scale or subjective description of mild, moderate, or severe pain. A highly significant was found (p=0.000) in patients who select scale 4 which is Mild to moderate.

According to salivary flow test., The results of test were highly significant (p=2.51). in patients with BMS(Group A) have more less saliva reading in contract with Control Group (Group B) and Xerostomia was clearly occur as well.

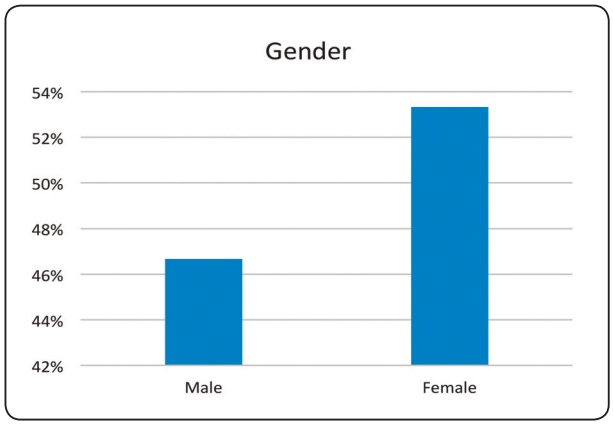

Fig. (2) Histogram showing the mean changes of Gender and Age outcome after diagnosis of Burning mouth syndrome

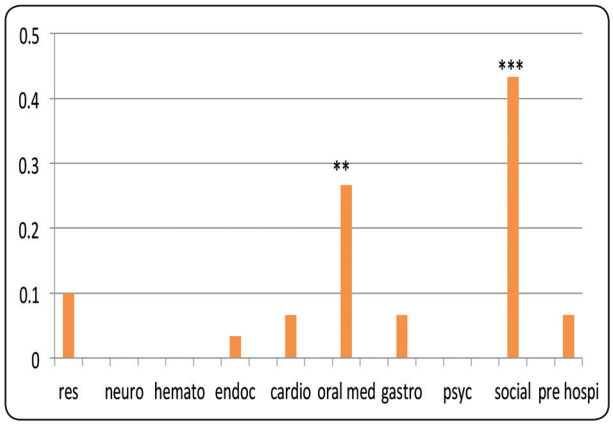

Fig. (3) Medical problems related to burning mouth syndrome.

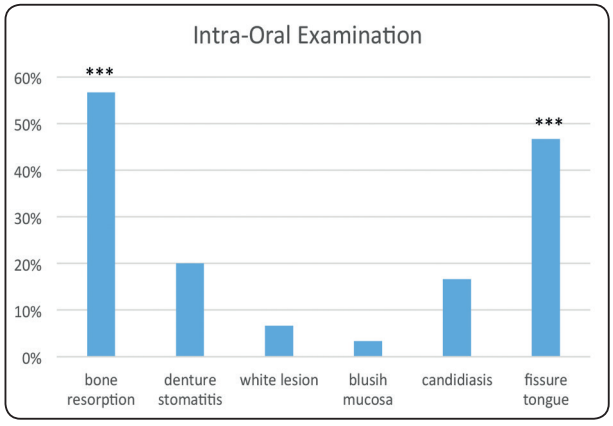

Fig. (4) Intraoral examination of BMs patients.

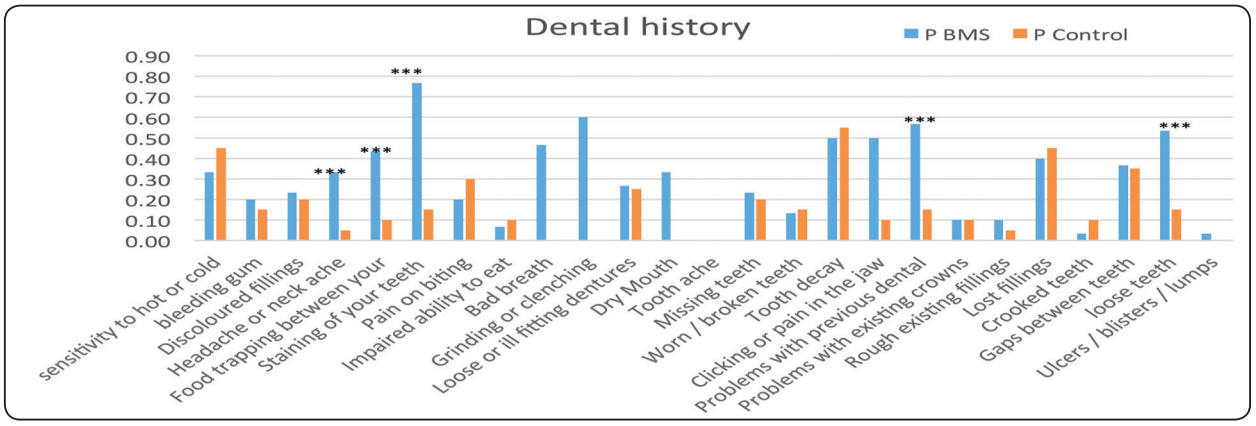

Fig. (5) Comparison between Burning Mouth Syndrome and Control Group regarding the Dental History.

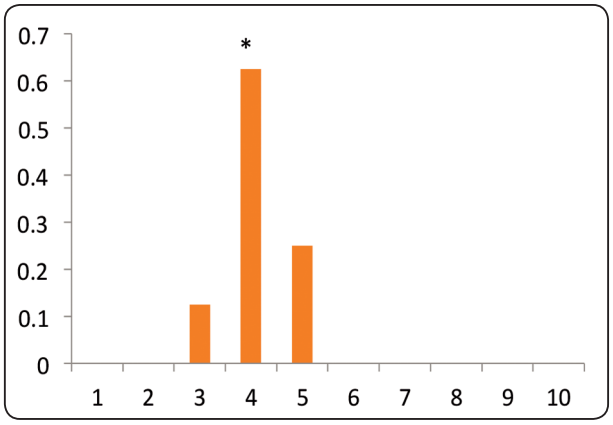

Fig. (6) Pain measurement Scale for Burning Mouth Syndrome.

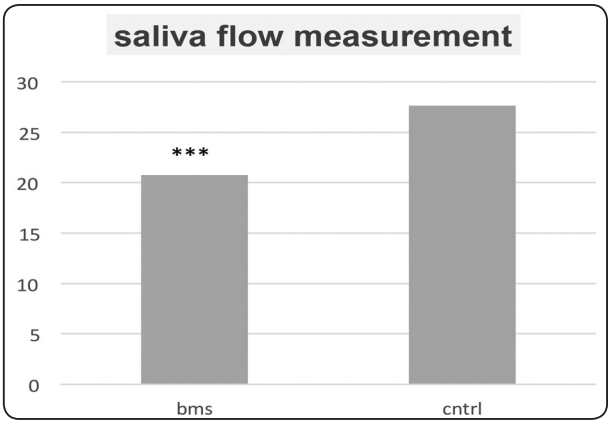

Figure 7: Comparison between patients with BMS (Group A) and Control (GroupB) regarding (Salivary Flow Test)

TABLE (1) Patients with Allergic assessment.

Allergic reaction	Patient
Penicillin	0
Sulfa	0
Aspirin	0
Local Anesthesia	0
Opiateslcodeine	0
Latex	0
Others(food,metals)	13

Allergic assessment was performed that only for (13) patients (from Group A) of the total have allergy to specific type of food (hot/spicy food).

DISCUSSION

Burning mouth syndrome (BMS) is a chronic condition characterized by burning of the oral mucosa, with or without dysgeusia and xerostomia, in the setting of no underlying systemic disease or identifiable abnormalities on physical examination or laboratory testing. BMS disproportionately affects postmenopausal women(22&35). The pathophysiology of the disease is unknown; no single treatment has proven universally successful. In light of these shortcomings, having a practical approach to the evaluation and management of patients with BMS can improve both patient quality of life and physician satisfaction[22,30,34].

Scala et al., 2003[26] concluded that Burning Mouth Syndrome (BMS) refers to a chronic orofacial pain disorder and it is a relatively common condition with an estimated prevalence is of 0.7- 4.6% in the general population; however, the condition affects mostly middle aged women. [1] BMS's apparent association with gender, age and menopause has long been suspected because of hormonal changes that occur and which could have a pathogenic role. [2,8,10]

BMS has two types which are; **BMS** do not reveal an underlying medical problem, the diagnosis is primary BMS. Experts believe that primary BMS is caused by damage to the nerves that control pain and taste., and other type of BMS is related to Certain medical conditions which can cause BMS. Treating the medical problem will cure the secondary BMS. Common causes of secondary BMS include; Hormonal changes (such as from diabetes or thyroid problem); Allergies to dental products, dental materials (usually metals), or foods; Dry mouth, which can be caused by certain disorders (such as Sjögren's syndrome) and treatments (such as certain drugs and radiation therapy); Certain medicines, such as those that reduce blood pressure; Nutritional deficiencies (such as a low level of vitamin B or iron); Infection in the mouth, such as a yeast infection and Acid reflux BMS is hard to diagnose. [2,18,34]

Following the evaluation of the data in the all expert literatures were studied, it can be said that there is a lack of a universally accepted definition of BMS, and disease characteristics are still imprecisely defined. This can easily lead to misunderstandings, most of them because of the most common terms to define different clinical forms of glossodynia,they only share the burning mouth syndrome sensation. The salient features of this syndrome can be summarized in the following definition 'idiopathic pathological condition which is characterized by a burning sensation in the mouth. [9,25]

The purpose of the present study was designed to evaluate the etiologic factors of Burning mouth syndrome and explore its characteristics with the specific outcome of increasing awareness of the condition as well as the pathogenesis.

The present study was performed as a cross-sectional analytical study on Sixty (60) Thirty (30) patients were selected as a Group (A) from outpatients Clinic in RAKCODS of both sexes and range of ages (30-70) with a chief complain mainly related to the tongue surface of Burning sensation or pain in the mouth with no observable oral mucosal lesion which was considered as Burning Mouth Syndrome (BMS).,and the other Thirty (30) patients were considered as a Control Group which completely free from any pain, complains, with clinically healthy oral mucosa and completely free from any kind of systemic diseases or allergic reaction.

The demographic characteristics of the patients in the present study (as be shown in Figures (2 &3) are similar to those reported previously in the literature of Klasser & et.al; 2011. In our study sample go in agreement with their results, which related to patient groups with the greatest BMS burden have been women of middle age and older. This finding has been attributed to both the frequency of psychological disorders in this group and the premenopausal decline in estrogens and progesterone levels, which may lead to xerosis. Increased use of hormone replacement therapy could also contribute to the high disease incidence in this group. The high disease occurrence in this group has also provided the basis for the proposal of hormonal pathogenesis of BMS. [14,15,19]

As in Figures (3) in Our study was in agreement with the findings to prior studies of Komiyama O &et.,al in 2013 have found significant associations of smoking with BMS,whereas a separate study found recent smoking cessation to be a risk factor for BMS development. Some investigators have proposed that there may be a link between smoking

and BMS since smoking causes a taste disturbance in some persons. [15,16,17]

Symptom characteristics (as in figure 4 & 5) in the present cohort were analogous to those cited in the literature of Sengupta P in 2012. Many patients from this sample had symmetrical, bilateral mild burning pain of the tongue that was continuous throughout the day. The tongue has been described as the most frequently involved anatomic location, a claim supported by our study. Patients described their tongue symptoms as being more commonly anterior than posterior, which has been described previously. The present study also supports the typical bilateral distribution of BMS. Prior studies have cited scarce involvement of the lips, palate, buccal mucosa, and gingiva. In contrast, we found frequent involvement in other anatomic sites, particularly the lips and palate[31].

Pain intensity in this population was milder than in other studies, which reported moderate to severe pain at the time of BMS diagnosis. [10,12] Findings of the present study (as shown in figure 6) has supporedt the claim that the pattern of symptoms in BMS is usually continuous, rather than paroxysmal. Pain absent on waking and developing during the day, pain present throughout the day, and intermittent pain with pain-free days. Our patient population was most commonly classified as having type 2 BMS. Interestingly, 2 patients noted that their symptoms were present at night rather than during the day, a temporal classification that to our knowledge had been unreported previously. The prevalence of dysgeusia in our cohort was less than typically observed. In prior studies, as many as 60% of a BMS cohort reported a bitter or metallic taste and 35% reported altered taste. Xerostomia was present in patients, which is high common than other previously reported values. Only 1 patient reported sialorrhea, which has been similarly rare in previous BMS studies[23]. Some investigators have suggested that sialorrhea may be a misinterpretation of xerostomia. Xerostomia, the subjective report of oral dryness and a common symptom of BMS, must be understood as a separate entity from salivary hypofunction, which is a potential cause of oral burning (figure 7).

The data show that BMS is highly associated with female sex and advancing age. In contrast, Olmsted County was only 51.1% female with 13.3% of the population older than 65 years in 2012. There was a decrease in female incident cases in 2009. Review of coding methods performed by the REP from 2000 through 2010 showed this finding to be accurate and not the result of missed cases. The analysis also showed incidence rates that increased significantly after age 50 years across age-groups but did not show statistically different trends in age between the sexes. The lack of sex difference may be owing to the low incident rates in male patients. Most studies report a higher prevalence in women. Our study is suggestive that BMS is an uncommon disease. Confounding factors such as xerostomia may also be problematic. Xerostomia has been proposed to cause oral burning. One study found that in patients with xerostomia and BMS reported a reduction or alleviation of their burning symptoms after the treatment of xerostomia alone [18,13]. Immunologicakkl etiology is also relevant.

Table (1) shed lights on a very important point about some allergic reactions to some patients which is an accepted results with some authors who have reported that Food antigens as ascorbic acid, cinnamon, nicotinic acid as well as allergens such as dental alloys, mercury or gold or a detergent contained in the dentifrice are incriminated in the development of BMS and they have reported healing by eliminating contact with the allergens [1, 14, 15].

In summary, we agreed with Andy Sun &et. al that, BMS is probably of multifactorial origin and may be idiopathic. The etiopathogenesis of BMS seems to be complex. For treatment of BMS,

the clinicians should first try to identify the precise causative factors for the BMS, because treatment or elimination of these factors usually results in a significant clinical improvement of oral burning and pain symptoms. If patients still have the symptoms after removal of potential causes, drug therapy should be instituted. Previous clinical trials have found that drug therapy. In addition, psychotherapy and behavioral feedback may also help eliminate the BMS symptoms.[4]

Our recommendation ; In accordance with (Mock; D; D. Chugh in 2010); who found the clinician to obtain a clear and detailed disease and medical /dental history as well as perform a through oral clinical examination including any laboratory studies indicated. Aneurogical examination is useful, unless there are marked deficiencies, the lack of baseline data can present a problem., if other causes of this symptom are ruled out and / or the patient fails to respond to a normal course of treatment a diagnosis of BMS is reasonable(24). Also in patients with Sjoren's syndrome or treated with radiotherapy for oral Cancer, there is virtually no salivary secretion. They complain of burning sensation, dysgusia, difficulty in speech and there may be lobulation and fissuring of the tongue (5).

Also ;the authors have recommended to add further investigations which approved with Aggrwel &et;al 2012, modern interdisciplinary approach is needed to solve the diagnostic dilemmas of BMS. The previous clinical trials have found that drug therapy (with capsaicin, or antidepressants)may provide relief of oral burning or pain symptom. In addition, psychotherapy and behavioral feedback may also help eliminate the BMS symptoms(1&2).

CONCLUSIONS

1- BMS has a widely affect in women in middle age and men with older age.

2- Post menopause (Hormones disturbance) was a reason with BMS in female patients.

3- Only patients who have some factors like (use tobacco, oral lesions, stress, problem with dentition) can causes BMS in younger age.

4- Pain was performed from mild to moderate after assessment. So patients should manage these condition and treat the other causes to relief the symptom of BMS.

5- The key of successful management is a good diagnostic work-up and co-ordination between the dental practitioners, psychologist and physician.

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