Etiology of the oral burning pain and its relationship to sex, age and anatomical sites

(Clinical study among a sample of Iraqi patients in Baghdad)

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ABSTRACT

Background: The studies about oral burning pain are few in Iraq in spite of this disease is a significant common among numbers of Iraqi patients, so more information were required in order to avoid its effect and occurrence. The aim of the current study is to determine the actual causes for the disease by examining a sample of Iraqi patients in Baghdad, in order to evaluate its relationship to the age, sex and the anatomical sites.

Subjects and methods: Sixty patients were selected from two hospitals, several specialized dental clinics and public medical clinic, in east of Baghdad (Sadder, Jamella and Baladeayte cities). Nineteen patients were excluded because they could not continue in this study. The remaining forty one patients, 23 female patients, their ages range between 25 – 60 years, while the male patients were 18, their ages ranged between 20 – 60 years. The duration of symptoms of burning inside the oral cavity ranged from 6 months to 3 years. Each patient in this study was examined clinically to detect any oral lesion may have direct cause for the disease, also patients were asked about the types of drugs intake, in addition to their psychological conditions. The medical and dental histories were taken from all examined patients, also all medical and dental reports of the patients were determined. Few results of different investigations of the examined patients were replaced by new ones, and the others were taken in consideration for obtaining results for this study. Fasting blood sugar, thyroid function test, histopathological examination and others were examples for such investigations which had been done. The most important finding in this current study that the cause of oral burning pain in the examined Iraqi sample was mainly multi factorial causes and a few cases were caused by single etiology.

Results: this current study that the most common causes of the oral burning pain in this Iraqi sample was, hormonal changes, bad psychological conditions, side effects of some drugs intake, chronic gastritis in addition to other factors. The most anatomical site affected inside the oral cavity was the dorsal portion of the tongue.

Conclusion: One conclusion for the current study in some examined cases was found that a hiding cause may play a role in oral burning pain occurrence beside other factors. This study appeared that female patients over 50 years were more susceptible to this disease than male patients; also older age groups for both sexes were mostly affected.

Key words: Oral burning pain, Menopause. (J Bagh Coll Dentistry 2012; 24(Sp. Issue 2):70-77).

INTRODUCTION

Oral burning pain is a burning symptom in the oral cavity or tongue that might be associated with clinical or laboratory abnormalities. The pain may coexist with other oral conditions; patients with oral burning pain may have a significant emotional impact which suspected of exaggerating their symptoms. The condition is seen most often in women, particularly those are post menopausal. Oral burning pain is often absent during the night but progressively increases throughout the day and into the evening (1). Oral burning pain is common complex problem that causes the individual to experience burning pain on the lips, tongue, and some times throughout the mouth. There are often no visible signs of irritation (2).

The main symptom of oral burning pain is moderate to severe burning in the mouth and can
Persistent for months or years, in many people, the burning sensation begins in late morning, builds to a peak by evening, and even subsides at night. Anxiety and depression are common in people with oral burning pain and may result from chronic pain\(^3\). 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 patient underlying local and systemic condition which could lead to symptoms of burning might be found, finally, in patient where these clinical and laboratory finding are lacking, diagnosis of true oral burning pain is established and that all the other oral burning pain are due to a different pathologies representing with one symptom within the clinical spectrum of such a group of pathologies\(^4\).

Several diseases of the oral mucosa may have burning as symptoms, such as herpes simplex virus, aphthous stomatitis, xerostomia and others. However, patients who refer a burning sensation if the oral mucosa or a chronic pain without any visible alteration of the oral tissues might be diagnosed as having burning mouth syndrome. It is very important for clinicians to be able to distinguish the oral burning pain caused by a specific disease beside burning mouth syndrome (BMS). Burning mouth syndrome (BMS) usually affects people over the age of sixty years and occurs more in older women\(^5\).

The etiology of the burning mouth syndrome is still poorly understood, recent studies have proposed neurological background, trigeminal small – fibers sensory neuropathy, also interactions between taste and oral pain are responsible for oral burning pain and that the intensity of the peak oral pain correlated with the density of fungi form papillae\(^6\). Among the possible risk factors for oral burning pain are numerous psychopathological situations in which the microcirculatory mechanisms are involved in pain generation. A local microcirculatory disturbance in the areas affected by oral burning pain could contribute to the burning sensation described by patients. Some authors found that patients with oral burning pain had Para functional habits such as tooth grinding, clenching (bruxism), or tongue thrusting that could lead to changes in the intra – oral blood flow. Oral burning pain may be caused by hormonal changes, vitamin deficiencies, systemic diseases such as diabetes, some drugs intake, sensitivity to some materials, food and other causes\(^7\). Therefore this study aimed to evaluate the causes of oral burning pain and its relationship to sex, age and anatomical sites among a sample of Iraqi patients in Baghdad.

**PATIENTS AND METHODS**

**Patients**

Sixty patients were studied in this study they were collected from:

- Al-Imam Ali general Hospital in Sadder city.
- Al-Sadder Hospital also in Sadder city.
- Medical public health clinic in Baladeyate – Baghdad.
- Several private special dental clinics in Jamella city.

Nineteen patients were excluded from this study because they could not continue to the end of this study. The remaining forty-one patients were used to achieve this study and actually had symptoms of oral burning pain and they suffered from the disease. Forty-one patients were 23 female patients, their ages ranged between 25 – 65 years, while the 18 male patients, their ages ranged between 20 – 65 years.

**Methods**

To detect the causes of the oral burning pain and its relationship to sex, age and anatomical sites for this study, the following procedures were done:

- **History taking:** included knowledge about the medical, dental and psychological conditions for the examined patients.
  1. Determine the previous medical reports for the examined patients from the Hospitals, special medical or dental centers and special private clinics.
  2. Recording of the previous tests (investigations) for the examined sample of patients to avoid the repeating of the tests and to save time.
  3. The old previous investigations were replaced with new ones.
  4. Patients were asked about the medication intake specially the anxiolytic, angiotensin, diabetic drugs and antispasmolytic medication and others.

- **Clinical examinations:** Dental and medical history was taken from each participant, also clinical examination of the oral cavity was performed, the quantity and the type of saliva, concerning xerostomia, the mouth dryness is primarily felt by the patient himself (subjective xerostomia) when there are insufficient amount of saliva inside his mouth. The examiner also can
identify the quantity of saliva clinically by lipstick method on the labial surface of the anterior maxillary teeth.

Also when the tongue is held by blade against the buccal mucosa, then the blade is lifted away; the tissue will adhere to the tongue; these signs suggest the mucosa is not sufficiently moisturized by saliva and that means hypo secretion of salivary glands. Measurement the quantity of saliva was done by assessment the salivary flow rate by using simple spitting method into calibrated tube during five minutes while participants were sitting; values lower than 0.2 ml/minutes were considered as an indicator of xerostomia. Altered taste sensation was described by the patient either with reduction in taste perception or the presence of a persistent unusual frequently bitter or metallic taste, or alteration in taste included complaints of changes in the intensity of taste perception. The type of saliva can be evaluated by examining the remaining of saliva inside the patient mouth or obtaining excessive saliva by stimulating the major salivary glands in order to determine the consistency of saliva whether it is watery, clear, viscous or scant in nature. The conditions of oral hygiene was assessed clinically by mirror and probe to detect any dental caries, pocket, calculus and any other oral lesions, also evaluation to the dentures and bridges that the patients wearing from any porosity and roughness, in addition to that special attention must be given to the dentures, since it has been demonstrated that there is a possible correlation between the adjustment and the design of denture both may cause changes in the sensory nerve function, causing atypical oral pain. Any sensitivity or allergies were detected to the denture material or foods depending on patient's experience or clinician observation (such tests not sent to the laboratory to investigate the sensitivity test).

c. Laboratory investigations:

1. Hematological screening for complete blood count, glucose level, thyroid function test, blood serum and nutritional factors. Blood work was done to look for infection, nutritional deficiencies and disorders associated with oral burning sensation such as diabetes or thyroid gland problems. Complete blood picture was used to asses HB, PCV, ESR and the counts of white and red blood cells. Fasting blood sugar was done to estimate the level of glucose in the blood to prove the previous diagnosis; whether the examined patients were really diabetes (hyperglycemic) or not. Thyroid function test also was done to prove the previous diagnosis of hypothyroidism by using TSH, T3 and T4 tests to estimate the level of thyroxin in the blood. The mal nutrition patients were diagnosed according to referral forms by their physicians describing them that they suffered from, pale skin, brittle finger nails, weakness, loss of appetites and loss of hair in addition to oral sensation. Mal nutrition may be caused by chronic mal absorption which trigger a loss of appetite and abnormal metabolism. The laboratory investigations were described as follow: anemia typically estimated by HB of less than 11gm/dl, while B12, iron deficiencies were detected by performing complete blood picture tests and finally minerals were investigated by biochemical test of blood serum, all these signs and investigations proved the presence of malnutrition and iron deficiency anemia.

2. Some examined patients were diagnosed by the Gastrointestinal physicians that they were affected with helicobacter pylori bacteria and developed gastro oesphagal infection according to their medical records and referral forms since the diagnosis was present in the referral forms, in Iraq, the test which required to identify the H. pylori bacteria called (H. pylori antigen rapid test) and it is described in brief as follow; H. pylori antigen in human stool specimen, the test results are intended to aid in the diagnosis of H. pylori infection, to monitor the effectiveness of therapeutic treatment and to confirm the eradication of H. pylori in peptic ulcer patients.

Other report related to patients with BMS and affected with gastritis by H. pylori bacteria, described the detection of this bacteria by using an endoscopy to go down the throat to collect a tissue sample from the stomach to be tested histopathologically, these procedures were conducted under anesthesia.
3. Oral candidiasis cases: Candidiasis species from oral mucosa can be scraped off easily (scraping test) to differentiate it from other oral white lesions leaving ulcerative painful surface, for the direct microscopic examination and detection of Candida-albicans hyphae, scraped specimen from the inflamed tissues was collected by using a sterile lancet, also it is possible to culture Candida using a sabauraued agar to aid in the definitive identification of the fungal organism. The procedures that were followed in the laboratory concerning Candida described as: The swab was cultured on sabauraued media for 24 hours in 37c by biochemical test; identification of Candida-albican will be confirmed.

In brief words, positive cultures for samples from the mouth, Candida was observed and by biochemical test Candida-albican was the most species in the examined samples.

4. Psychiatric diagnosis were examined by reviewing patients medical records and referral forms, since a number of diagnoses were present in the referral forms, they were categorized according to the International Statistical Classification of Disease and related Health problems, into tenth revision (ICD-10).

RESULTS

Twenty three female patients and eighteen male patients, that was forty one males and females patients all of them suffered from oral burning pain, those patients were examined in this study to determine the actual causes of this disease among the tested samples and the relation of age, sex and oral sites affected. The examined patients were divided into female and male patients, the following procedures for obtaining the results were done as follow:

1. The female patients: Forming 56.1% from the total examined cases. Table 1 illustrated that female patients over 50 years were mostly involved by oral burning pain due to hormonal changes and psychological conditions, the tongue was the common anatomical site affected, and they were described as follow:

a. Seven females forming 30.6% from the total examined females and about 17% of the total included cases, aged over 50 years suffered from oral burning pain with duration about (1-1.5) years. Three of them complained from depression, they received sedative drugs, according to medical report one of them her psychiatrist physician described her; diminished ability to think or concentrate or indecisiveness nearly every day either by subjective account or as observed by others. The other two women with depression had medical reports from the Hospitals and physicians describing them that they are in a mild, chronic depression, they may not realize that they are depressed, anti-depressant or psychotherapy can help. The psychiatric conditions were classified according to the referral form into:

F6: Two female patients (disorders of adult personality and behavior).

F7: One female patient (mood affective disorders), also in this group there were other oral pathological conditions related to those female patients, such as dental pockets, poor oral hygiene, gingivitis, calculus, caries and finally mobile or missing teeth. The sensation was present in the tip, dorsum of the tongue and floor of the mouth.

b. Three females formed 13.1% from the total examined females, aged (35-50) years, had a history of hyperglycemia, according to previous medical reports, the diagnosis of diabetes was confirmed by doing new fasting blood sugar test, the symptoms duration of oral burning pain was about 2 years. The sensation was present in the lower lip and lower mucosa.

c. Two females formed 8.6% from the total females; aged (30-40) years respectively had a history of hypothyroidism, to confirm this diagnosis, the thyroid function test was done to estimate the level of thyroxin in the blood by doing TSH, T3 and T4 test and this test proved the previous diagnosis. The duration of the symptoms was about 9 months. The sensation was present in the lateral sides of the tongue and corner of the mouth.

d. Three females formed 13.1% from the total examined females, were under the medication of angiotensin drugs with cardiac problems according to medical reports from the Hospitals, their ages ranged between (55-65) years, and the duration of oral burning pain symptoms was about one years. Two of them received drugs for heart disease in addition to the antihypertensive drugs. The sensation was present in the ventral surface of the tongue, floor of the mouth and hard palate.
Three females formed 13.1% from the total examined females, with oral burning pain aged (25-40) years had a history of chronic gastrointestinal infection according to reports from private Gastroenterologist, revealed that those patients affected with H.pylori infection, in Iraq the presence of this type of bacteria is detected by H.pylori antigen rapid test, this test depending on detection of H.pylori antigen in human stool specimen, or by histopathological examination to the stomach biopsy by using an endoscopy to collect a tissue sample from the stomach to be tested. The duration of the oral sensation was about (3-4) years ago. The sensation was present through all over the mouth and soft palate.

Two females formed 8.6% from the total females, with oral burning pain aged (60, 65) years with long duration of symptoms sensation suffered from chronic vomiting with irritable colon according to their previous medical reports, this may cause acid reflux, also they were under medication. The pain sensation was present in tongue, lower lip and lower gingiva.

One female 28 years with oral burning pain, formed 4.3% from the total females had microglossia, sore tongue and congested oral soft tissues, the duration of the sensation was about 9 months. The sensation was present in the dorsum, ventral, lateral and tip of the tongue.

Two females formed 8.6% from the total females, aged (32 , 38) years respectively with oral burning pain and duration of 1 year , the previous and recent blood tests revealed the presence of Iron deficiency anemia for both of them, one female had pale face with fainting attack. The oral sites of sensation were the dorsum of the tongue, oro-pharangeal portion and buccal cheek.

Two male patients with oral burning pain, formed 11% from the total examined males, one of them 39 years had fissure tongue with food lodging inside the fissures. The other male patient 57 years, suffered from recurrent ulcers mostly appeared in the tip and the ventral surface of the tongue, the duration of sensation appeared 1.5 years ago.

Two male patients formed 22.3% from the total examined males, aged (20, 35) years suffered from psychological disturbances and received anxiolytic and sedative drugs according to medical reports from psychiatric physicians, the duration of the sensation was about 1 year. All over the mouth was affected.

One male patient formed 5.5% from the total examined males, aged 45 years with oral burning pain, developed severe gingival hyperplasia with pus discharge and bad oral odor; the common oral sites affected were the gingiva and the palate. This study revealed that female patients with hormonal changes and psychological problems mostly suffered from BMS, while male patients with poor oral hygiene and
bad oral conditions mainly complained from BMS.

**DISCUSSION**

Instability of the social environment is considered an important factor which has a negative impact reflects on the health status of the society. Sanctions, wars and postwar pollutions, economical and political instability all are factors the Iraqi society has been exposed for years. The incidence of diseases and stress related conditions is usually increased in such circumstances. BMS is a condition usually of unknown reason but may be associated with stress or hormonal disturbances. So this study revealed that the causes of the oral burning pain were mostly multifactorial because more than one etiology may share in causing this disease, so it appeared from this study that both males and females were affected but it was mostly more common in females especially those with older ages. This study revealed that the older ages were mostly involved and the tongue was the most common oral anatomical site affected. The hormonal changes in women during menopausal period, psychological disturbances and the side effects of the drugs intake were the most possible etiological factors for the oral burning pain. Females suffered from oral sensation may be explained due to hormonal changes during the transitional and post menopausal period, when the ovaries make much less estrogen and progesterone or may be due to diabetes disease.

The etiology in the studied sample was mainly multi factorial and a single cause for a few numbers of cases, but in other similar statistical studies population was found that the main causes of oral burning pain were a single etiology and a few cases of oral burning pain were multi factorial. The current study resembled other similar studies in respect that the tongue was the most common oral site affected and menopausal women also were more affected especially older ages. Examined patients with gastritis complained from BMS may be due to the reflex effect of the disease on the oral soft tissues, also patients under anti spasmyloytic drugs, suffered from BMS may be because the dryness of the mouth which was one of the etiological factors in the occurrence of BMS.

In this study many BMS associating factors has been included to detect the most common factors related with this symptom condition. It was noticed that this condition among Iraqi population is multi factorial, but the current study revealed that females over 50 years were more affected than males, may be because of the hormonal changes in females. During this study it was found that depression and drugs intake for hypertension and hyperglycemia, gastritis and bad oral hygiene were the significant etiologies for oral burning pain, the cause may be due to the spreading of these diseases among Iraqi society, also old age groups were more affected than younger ages may be because of hormonal changes or due to immunity weakness.

This study also revealed that the most common oral anatomical site affected was the tongue; this may belong to the fact that the tongue contains the papillae which exaggerated the feeling of pain sensation. During this study it was found that most cases of oral burning pain in this Iraqi sample of patients was caused by multi factors, differed from other similar population studies which mostly the oral burning pain caused by single factor.

A study had been conducted in 2005 by Lauria et al (8) proposed neurological back ground and trigeminal small-fibers, sensory neuropathy as etiological factor in causing oral burning pain, in the current study there were emotional stress and depression as etiological factors for oral burning pain.

Lamey et al (9) applied in 2005 a study proved significantly higher prevalence of gastritis in patients with true oral burning pain, this study suggested that every patient with oral burning pain should be referred to the gastroenterologist; in the present study it was found that gastritis also was a cause for oral burning pain.

In 2007 Patton(10) conducted a study which revealed that the supertaster people who have the highest density of fungi form papillae, which are responsible for taste, in the anterior tongue and taste as intensely bitter, the current study, also appeared that the tongue was more sensation inside the oral cavity in the examined patients with oral burning pain.

The relation between the etiological factors of oral burning pain and anxiolytics intake was highly significant, so psychological examination and counseling should be offered to those patients (11), the present study agreed that anxiolytics drugs intake also played a role in causing this disease according to medical reports from Hospitals and the physicians of the private clinics.

Some authors have suggested that there is multi factorial etiology, local systemic and psychological factors (12), in the present study the findings agreed with these suggestions.

The oral burning pain effected Italian people and it was more in women particularly after they
experience menopause-than in men 1.6 percentage (13), in the present studied sample also the women over 50 years were more affected with oral burning pain than men.

Other authors described a lower tongue temperature in patients with oral burning pain, which also could indicate alterations of the autonomic functions, still other researchers found Para functional habits in patients with oral burning pain, such as teeth grinding or habitual pressing of the tongue against the teeth, both of which could lead to changes in the intraoral blood flow (14), the present results pointed out that the studied affected patients with oral burning pain had many symptoms in the tongue such as sore tongue, microglosia, irritation or ulcers in the tongue by carious teeth and other causes. But the current study did not reveal Para functional habits or thrusting of the tongue.

Al-Aswad (15) in 2009 applied a study on (83) elderly Iraqi patients, the study revealed that 72% of them complained from dry mouth and 42% of the examined patients suffered from burning mouth syndrome, that agreed with the findings of the current study in respect that oral burning pain affected mainly older age groups more than others.

From this study the following conclusions were obtained:
1. There are multi factorial etiologies played roles in causing oral burning pain.
2. Old age groups of patients were more affected than others.
3. The tongue especially the dorsal portion of it was the most anatomical site affected in the oral cavity.
4. Female patients in old ages were more susceptible to oral burning pain than male patients.
5. Hormonal changes, psychological conditions, poor oral hygiene, gastro-intestinal disorders and the effects of some drugs intake were the main etiologies in causing oral burning pain.

REFERENCES
**Table 1:** Twenty three female patients with oral burning pain were divided according to the number of patients, possible etiology, age groups, the percentage of females among the total examined female cases and the common anatomical oral sites affected.

<table>
<thead>
<tr>
<th>No. of patients</th>
<th>Possible etiology</th>
<th>Age groups</th>
<th>% of patients</th>
<th>The common anatomical oral sites affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Ill fitting dentures and poorly constructed bridges</td>
<td>Over 50 years</td>
<td>30.6</td>
<td>Tip and dorsum of the tongue, floor of the mouth.</td>
</tr>
<tr>
<td>3</td>
<td>Hyperglycemia (diabetic patients)</td>
<td>35-50 years</td>
<td>13.1</td>
<td>Lower lip and labial lower mucosa.</td>
</tr>
<tr>
<td>2</td>
<td>Hypothyroidism</td>
<td>30-40 years</td>
<td>8.6</td>
<td>Lips, tongue and corners of the mouth.</td>
</tr>
<tr>
<td>3</td>
<td>Angiotensin and medication for cardiac disease</td>
<td>55-65 years</td>
<td>13.1</td>
<td>Floor of the mouth, ventral of the tongue and hard palate.</td>
</tr>
<tr>
<td>2</td>
<td>Chronic gastro-intestinal infection</td>
<td>25-40 years</td>
<td>13.1</td>
<td>All over and corners of the mouth.</td>
</tr>
<tr>
<td>2</td>
<td>Chronic vomiting and irritable colon</td>
<td>60-65 years</td>
<td>8.6</td>
<td>Lower lip, Floor of the mouth, tongue, and lower gingiva.</td>
</tr>
<tr>
<td>1</td>
<td>Microglossia, sore tongue</td>
<td>28 years</td>
<td>4.3</td>
<td>Ventral, tip and lateral sides of the tongue.</td>
</tr>
<tr>
<td>2</td>
<td>Iron deficiency anemia</td>
<td>32,38 years</td>
<td>8.6</td>
<td>Upper and lower lip, buccal mucosa, tongue and hard palate.</td>
</tr>
<tr>
<td>23</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2:** Eighteen male patients with oral burning pain were divided according to the number of patients, possible etiology, age groups, the percentage of males among the total examined male cases and the common anatomical oral sites affected.

<table>
<thead>
<tr>
<th>No. of patients</th>
<th>Possible etiology</th>
<th>Age groups</th>
<th>% of patients</th>
<th>The common anatomical oral sites affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Ill fitting dentures and poorly constructed bridges</td>
<td>50-65 years</td>
<td>22.3</td>
<td>Mucosa of lower lip, tongue and buccal cheek.</td>
</tr>
<tr>
<td>5</td>
<td>Poor oral hygiene with bad dental condition</td>
<td>Different age groups</td>
<td>28.1</td>
<td>All over the mouth, dorsum of the tongue and floor of the mouth.</td>
</tr>
<tr>
<td>3</td>
<td>Anti spasmolytic medication</td>
<td>30-55 years</td>
<td>16.6</td>
<td>Lips, dorsum of the tongue and corner of the mouth.</td>
</tr>
<tr>
<td>1</td>
<td>Moxideuretic drugs and dry mouth</td>
<td>53 years</td>
<td>5.5</td>
<td>Tongue, buccal mucosa and floor of the mouth.</td>
</tr>
<tr>
<td>2</td>
<td>Fissure tongue and recurrent ulcers</td>
<td>39,57 years</td>
<td>11</td>
<td>Tip and ventral sides of the tongue and floor of the mouth.</td>
</tr>
<tr>
<td>2</td>
<td>Anexiolytic and sedative medication</td>
<td>20,35 years</td>
<td>11</td>
<td>All over the oral cavity and the oropharyngeal site.</td>
</tr>
<tr>
<td>1</td>
<td>Severe gingival hyperplasia with pus discharges.</td>
<td>45 years</td>
<td>5.5</td>
<td>Gingiva and palate.</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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