Oral Health Impact Profile-14 as an assessment tool for quality of life in Secondary Burning Mouth Syndrome patients

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Abstract

Objective: To investigate the impact of burning mouth syndrome on the quality of life by means of Oral Health Impact Profile 14 (OHIP-14) and to compare the OHIP-14 scores in different underlying conditions.
Methods: The study was executed at the Department of Oral Diagnosis, Ziauddin College of Dentistry, Ziauddin University from June 2018 until June 2019. Fifty-four individuals suffering from BMS were included in this study out of which 33 were females and 21 were males aged between 18 and 60 years. The individuals were required to fill out a form which included details of their demographics, any known systemic conditions that they were suffering from and details of any medications being taken. The patients were then distributed into different groups according to any comorbid condition or any medications they were taking. The conditions according to which the patients were grouped were diabetes, post-menopause, gastroesophageal reflux disease, Sjogren's syndrome, intake of anti-hypertensives or psychological factors. In addition, patients were interviewed using the Oral Health Impact Profile 14(OHIP-14). For the statistical analysis, frequencies and percentages were used for categorical data and means and standard deviations were employed for the numerical data. Kruskal-Wallis test was applied to see if associated conditions had an effect on the severity of BMS measured in terms of Oral Health Impact Profile 14 .
Results: The scores for the domains of physical pain and physical disability were highest whereas the lowest scores were observed in the categories of psychological discomfort and psychological disability. The data was not homogenous; therefore, the non-parametric test Kruskal-Wallis test was carried out to find if there was any significant difference in the OHIP scores in the different groups namely diabetes, post-menopause, Gastroesophageal Reflux Disease, Sjogren's syndrome, intake of anti-hypertensives or psychological factors. A p-value of 0.169 was calculated indicating that there were no significant differences observed in the OHIP-14 scores among the different groups.
Conclusion: Burning mouth syndrome has a negative impact on the quality of life according to the OHIP-14 scores. However, associated comorbid or other underlying conditions namely diabetes, post-menopause, Gastroesophageal Reflux Disease, Sjogren's syndrome, intake of anti-hypertensives or psychological factors did not alter the OHIP-14 results significantly.
Keywords: Burning mouth syndrome, oral health, multiple chronic conditions
IRB: Approved by Ethical Review Committee of Ziauddin University, Ref No. 0641118JKOM. Dated: 18th February 2019.
Citation: Kishore J, Shaikh F, Zuberi AM, Mirza S, Ikram S, Raffat MA. Oral Health Impact Profile-14 as an assessment tool for quality of life in Secondary Burning Mouth Syndrome patients [Online]. Annals ASH KMDC 2019:24 (4).

(ASH & KMDC 24(4):200;2019)

Introduction

Burning mouth syndrome (BMS) has been described by the International Association for the Study of Pain as "unremitting oral burning or similar pain in the absence of detectable oral mucosal changes". Having a sizable prevalence of 4% on an average, the disease is common worldwide[1-34]. The condition may be extremely painful most commonly involving the anterior two thirds of the tongue. BMS has been classified as a syndrome because of the variable symptoms of pain, burning, altered taste perception, dryness and/or bitter metallic taste that it may generate. It has a significant female predilec-

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Date of Submission: 27th August 2019
Date of Acceptance: 8th January 2020

tion with the post-menopausal women being affected most commonly[5,6]. BMS has a considerably substantial impact on the social, physical and psychological well-being of the people who are inflicted with this condition. A wide range of scales and questionnaires have been designed to objectify self-reported sufferings of the BMS patients.

There is no universally accepted classification for BMS although the one proposed by Lamey and Lamb is widely used since it is clinically useful[7]. According to this classification, BMS is classified based on symptoms into three types: Type 1 BMS: no symptoms on awakening, burning sensation appears and increases in severity to reach its peak by evening. In type 2 BMS, there is continuous persistence of symptoms throughout the day and night with some patient finding difficulty in falling asleep. In type 3 BMS there are intermittent symptoms during the daytime and between days. BMS is also classified as primary BMS when the cause remains unknown and secondary BMS when there is an underlying cause. Conditions that may cause BMS are diabetes, post-menopause, hypothyroidism, nutritional deficiencies, gastro-esophageal reflux disease (GERD) and psychosocial factors.

Oral Health-related Quality of Life (OHRQoL) is defined as "the absence of negative impacts of oral conditions on social life and a positive sense of dentofacial self-confidence"[8]. The most commonly used instrument to measure OHRQoL is the the Oral Health Impact Profile-14 (OHIP-14) abbreviated from the original OHIP-49 (Oral Health Impact Profile-49) which contained 49 questions classified into seven domains based on Locker's model of oral health[9]. The knowledge on oral health-related quality of life is of utmost importance since it gives an overview of dental public health in general and in particular it can be used to describe the impact oral health can have on populations. This information can then be utilized in designing health policies, assessing disease burden and allocating healthcare resources.

OHIP-14 subjectively measures self-reported disability, discomfort and dysfunction in relation to oral conditions[10]. It is widely used internationally since firstly, it is available in several languages and secondly, it is valid for various populations[11]. The 14 items in the questionnaire evaluates oral health catering to seven domains namely functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and social handicap[12]. Data on oral health-related quality of life (OHRQoL) has public health importance because they can be used to describe the impact of oral health on populations. Consequently, they may serve to help allocate healthcare resources.

It is very unfortunate that due to low literacy and lack of formal education, the awareness regarding oral health is poor in Pakistan. Our population needs to be apprised of the fact that oral health is a major determinant of overall health and that poor oral health is associated with poor general health. Oral cavity is a mirror of the entire body and many systemic diseases first manifest in the oral cavity from where they can be easily screened and thereafter, managed accordingly. Burning mouth syndrome has various presentations which vary from patient to patient. The presenting symptoms are usually subjective, and the clinical presentation is unremarkable. Therefore, any tool which can help in assessing the disease and its severity with the help of any objective questionnaire, is very useful. There is very scarce research doneon BMS in Pakistan. This is the first study of its kind which measured OHIP-14 in patients suffering from BMS along with other conditions.

This study aimed at assessing the impact of BMS on the health-related quality of life using OHIP-14. Additionally, we wished to compare the OHIP-14 scores among different conditions that are responsible for secondary BMS.

Subjects and Methods

The present study was a cross sectional descriptive study that evaluated patients coming to the Outpatient Department of Ziauddin Dental College, Ziauddin University from June 2018 until June

2019, with a complain of burning and pain in the mouth. Patients were included in the study only after the final approval from the Ethics Review Committee (Reference Number: 0641118JKOM). The entire procedure was explained to the patients and they were guaranteed complete confidentiality. The study participants were then made to read and sign the consent form which was presented in both English and Urdu language. They were also apprised of the fact that participation was voluntary and that they held the right to withdraw from the study without any adverse consequence.

The sample size was calculated through the website www.openepi.com using a prevalence of 4% and a total number of 54 clinically diagnosed burning mouth patients were inducted in the study using the technique of non-probability (consecutive sampling) coming to the Outpatient Department.The inclusion criteria were patients with secondary BMS, of both the genders and aged between 18 and 60 years. Patients complaining of oral burning and pain for less than 6 months were excluded. Also excluded were any patients who, on clinical examination, had any oral mucosal lesion. Additionally, any patient who had more than one of the studied associated condition was not a part of this study.

A trained examiner provided a detailed and structured questionnaire to all the participants. The items in the questionnaire included demographic details namely name, age, and gender. The second part of the questionnaire included details of any other existing comorbidities and the medications that the patient was taking. This was followed by a section comprising details of the dental examination carried out including hard tissue examination and soft tissue examination. The hard tissue details included the total number of teeth present, decayed, missing and filled teeth and any prosthesis present in the mouth. The soft tissue examination encompassed details of any white or red lesions, ulcerations, color of the oral mucosa, presence of any lump, swelling or fissuring. The final section comprised of fourteen questions from the Oral Health Impact Profile-14. These questions were categorized under seven domains namely: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and social handicap. Patient responses had to be in the form of a five-point Likert scale whereby 0= never, 1= hardly ever, 2= sometimes or occasionally, 3= fairly often and 4= very often. The final OHIP-14 score was obtained in a range between 0 and 56 by summing up the ordinal values for the 14 items. Higher scores were indicative of a poor health-related quality of life whereas a low score of OHIP-14 indicated that the health-related quality of life was relatively better. After collecting the details of all the patients, the statistical analysis was performed using Statistical Package for Social Sciences (SPSS 2.0) where frequencies and percentages were analyzed for categorical data of general characteristics and, for the numerical data such as age and OHIP scores of the seven subscales mean and standard deviation was calculated. Considering the fact that the data was non-homogenous, a non-parametric test Kruskal-Wallis test was applied to find if there was any connection between different associated conditions and severity of BMS in terms of OHIP scores.

Results

There was a total number of 54 patients out of which 21(39%) were males and 33(61%) were females as shown in Table 1. The mean age of the study participants was 51.61 ± 9.99 years. Among the secondary causes of BMS, 20 (37%) subjects were post-menopausal, 13 (24%) had diabetes, 3(5.6%) subjects were suffering from gastro-intestinal reflux disease, 4 (7.4%) were already diagnosed with Sjogren's syndrome, 3 (5.6%) subjects were on anti-hypertensives whereas 11 out of 54 (20.4%) patients were taking anti depressants. The highest scores out of 8 was seen in the subscale of physical pain whereas the lowest scores were calculated in the social handicap category according to the values in Table 2. Amongst the category of physical pain, patients taking anti-hypertensives had the highest score of 7.00 + 0.0 followed by those were taking antidepressants (6.18 ± 1.60) and menopausal women (6.15 ± 1.66). Patients taking anti

hypertensives had the highest score (5.33 ± 1.53) in functional limitation category followed by patients having diabetes and Sjogren's syndrome. In the subscale of psychological discomfort, diabetic individuals had the highest score of 2.46 ± 2.14 followed closely by patients with menopause (2.10 ± 1.37), GERD (2.00 ± 0.00) and psychological problems (2.00 ± 1.09). The maximum score of physical disability was seen in the group of patients taking anti hypertensives (7.00 ± 2.64) followed by patients with GERD (5.33 ± 1.15) and Sjogren's syndrome (4.50 ± 1.29). Patients having concomitant GERD had the highest scores (3.66 ± 1.15) in the psychological disability category followed by diabetics (3.38 ± 2.06) and patients taking antidepressants (3.27 ± 1.84). The scores for psychological disability and psychological discomfort were relatively lower when compared to other categories. Table 3 shows the results of the Kruskal-Wallis Test which was conducted to examine the differences in the severity of BMS according to the OHIP scores in different associated conditions. No significant differences (p=0.169, df=5) were observed amongst the six associated conditions (menopause, diabetes, GERD, anti depressants, Sjogren's syndrome, anti-hypertensives).

Discussion

Chronic diseases tend to have substantial physical, psychological and social impact which can fortunately be measured using tools like health-related quality of life. Patients suffering from BMS have been reported to have a diminished quality of life measured through generic and specific questionnaires which provide a detailed snapshot of patient sufferings. This information can be of immense help in clinical practices. The data can also be used to design dental public health policies and can also prove to be effective in allocating resources to a pertaining field. The aim of this study was to evaluate the severity of BMS in terms of OHIP scores and to find if there are any differences in OHIP scores when BMS is present along with some other associated conditions (menopause, diabetes, GERD, Psychological factors, Sjogren's syndrome) likely responsible for secondary BMS.

In this study, a striking majority (61%) of the participants were females. This is in accordance to most of the researches on BMS demographics where the female to male ratio was noticeably high[13-15]. This could be attributed to higher frequency of psychological problems in women and additionally, greater probability of seeking medical/dental consultation. The mean age of the study participants was close to 52 years proving that BMS is very rare in the younger age group. This corroborates with other researches where the mean age of the study participants was either in the fifth or the sixth decade of life[16-18].

Post menopause was the most frequent associated condition giving rise to BMS symptomatology. This was in line with another study by KOHORST et al which postulated that postmenopausal women were most likely to suffer from BMS[19]. The decline in progesterone and estrogen following menopause cause xerostomia precipitating pain and burning in the mouth. Additionally, the change in the hormone levels may be responsible for psychological distress, precipitating BMS symptomatology.

Table 1. Demographic characteristics of patients with BMS

Characteristic	Total (N=54)
Gender	
Male	21(39%)
Female	33(61%)
Age in years	
Mean	51.61 ± 9.99
Range	36-82
Secondary BMS causes	
Post- menopause	20 (37%)
Diabetes	13(24%)
Intake of anti-depressants	11 (20.4%)
GERD	3(5.6%)
Sjogren's syndrome	4 (7.4%)
Intake of anti-hypertensives	3(5.6%)

BMS: Burning Mouth Syndrome; GERD: gastroesophageal reflux disease; N: total number; %: percentage of the total population

Table 2. Individual OHIP scores of the seven different domains in all the associated conditions

	Menopause	Diabetes	GERD	Psychological Factors	Sjogren's Syndrome	Anti-hypertensives	Mean Domain score
Functional Limitation	3.95±1.76	4.76±1.30	4.00±1.00	4.18±1.83	4.50±2.38	5.33±1.53	4.45
Physical Pain	6.15±1.66	5.46±1.33	5.33±2.31	6.18±1.60	5.50±2.38	7.00±0.00	5.94
Psychological Discomfort	2.10±1.37	2.46±2.14	2.00± 0.00	2.00±1.09	1.50±1.29	1.33±0.57	1.90
Physical Disability	4.35±1.66	4.07±1.2	5.33±1.15	4.00±0.77	4.50±1.29	7.00±2.64	4.88
Psychological Disability	2.10±1.68	3.38±2.06	3.66±1.15	3.27±1.84	1.50±1.29	3.00±1.73	2.82
Social Disability	3.95±2.03	2.92±2.21	3.00±0.00	2.18±1.40	2.25±0.95	4.33±0.57	3.11
Social Handicap	2.65±1.03	2.92±1.30	3.0±1.73	2.90±1.04	2.50±1.29	3.00±0.00	2.83

BMS: Burning Mouth Syndrome; GERD: gastroesophageal reflux disease.
Note: All values are means and standard deviation

Table 3. Mean OHIP-14 scores of the associated conditions

Associated Conditions	OHIP Scores
Menopause	24.89 ± 4.78 *
Diabetes	25.85 ± 5.89 *
GERD	26.33 ± 1.15 *
Psychological Factors	24.73 ± 3.85 *
Sjogren's Syndrome	22.25 ± 1.71 *
Anti-hypertensives	31.00± 3.00 *
Average OHIP score	25.33 †

* Mean values with Standard Deviation
† Average OHIP score of all the study participants

The second most common cause of BMS in our study was diabetes. Diabetes affects saliva production quantitatively and qualitatively facilitating hyposalivation and burning symptoms[20,21]. Furthermore, peripheral neuropathy is a consequence of long-standing diabetes[22] as part of the diabetes syndrome. The sensory-motor and autonomic neuropathies of the nerves in the oral region create oral symptoms of burning, pain, paresthesia and numbness[23].

The third most frequently associated condition was the presence of any psychological problem namely anxiety, depression and stress due to which the patients were taking antidepressants. This can be attributed to the fact that chronic stress or anxiety causes a sharp decline in the levels of adrenal steroids causing altered production of altered sensations in the mouth causing burning mouth syndrome[24]. The occurrence of BMS in the presence of GERD cannot be explained since there is no significant difference in the oral mucosal pH value of patients suffering from GERD[25]. The present study found BMS in 7.4% of the patients suffering from BMS.Small fiber neuropathy results when a possible humoral response occurs producing antibody against nerve tissue antigen in Sjogren's syndrome. The neuropathy likely causes the burning and pain of BMS[26]. Three subjects in the current study were on antihypertensives. This was in accordance with another research which stated that patients on antihypertensives are prone to suffer from xerostomia followed by burning and pain in the oral cavity[13].

The mean OHIP score for the total population suffering from BMS in the current study was 25.33 compared to a mean of 3.98 in the control group according to a study by JENA et al[27] and a mean of 6.55 according to a study by Liu and his colleagues[28]. The domain of physical pain had the highest scores in the current study. The same was

also found in a study by JENA et al where the subscale of physical pain had the highest reading. This can be explained by the fact that patients came with a primary complain of severe pain and burning in the oral cavity which resulted in severe discomfort and problems in eating. Physical disability and functional limitation were the second most scored domain. This confirmed the results of a Korean study by PARK et al and a Spanish study by LOPEZ-JORNET et al who reported second highest scores for the domains of physical disability and functional limitation[29,30]. This can be explained by the fact that BMS leads to a worsening of the taste which results in an unsatisfactory diet. The results of all other domains showed a negative impact on the quality of life. The persistent symptoms of burning, pain and dysgeusia for months to years and a lack of a definitive treatment causes severe mental suffering exerting an adverse influence on the normal routine lives of the affected individuals.

Comparing the results of the different associated conditions, the highest OHIP-14 readings were observed in patients taking anti-hypertensive medications although there were no significant differences observed in the OHIP-14 scores in the different categories. This proves that burning mouth syndrome adversely affects the quality of life irrespective of any underlying pathoses. According to the present study, comorbidities do not have a significant adverse impact on the quality of life as measured by OHIP-14.

Health-related quality of life is commonly used instrument for assessment of psychosocial and physical impact of chronic diseases. Patients inflicted with BMS have been reported to have a lowered quality of life. The impact of burning mouth syndrome has been previously seen by other researchers with the help of various instruments and questionnaires. However, to the best of our knowledge this is the first ever study conducted to assess the significance of associated conditions on the quality of life.

This study had a few limitations which may be given consideration in future studies. There was no control group which could help in accurate comparisons between BMS and healthy subjects. Secondly, OHIP-14 is based on subjective answers by the patients which could be either overexaggerated or understated. In future, another objective questionnaire could be employed alongside OHIP-14 to come to stronger conclusions.

Conclusion

BMS had a negative impact on the health-related quality of life of individuals across all domains, irrespective of any comorbidities or other secondary conditions present along with BMS.

Conflict of Interests

Authors have no conflict of interests and received no grant/funding from any organization.

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