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Serum and Non- Stimulated Whole Salivary 25-Hydroxy Vitamin D in Patients with Burning Mouth Syndrome

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Abstract

The term burning mouth syndrome refers to burning sensation of the mouth that has no detectable cause. The symptoms do not follow specific anatomic pathway, also no known oral lesions or systemic disorders explain these symptoms. In addition to that no characteristic laboratory findings are detected. Evaluation of serum and non- stimulated whole salivary 25-Hydroxy vitamin D concentrations in subjects with and without burning mouth syndrome. The study was carried out on 57 participants (28 with burning mouth syndrome and 29 without burning mouth syndrome). Non- stimulated whole saliva samples were obtained by expectoration. About 5 ml of blood were drown from each participant. The serum and salivary 25-Hydroxy vitamin D concentrations were measured by ELISA technology. No significant difference was detected between case and control groups in serum 25-hydroxy vitamin D concentration (120ng/ml and114ng/ml respectively) and in non- stimulated whole saliva 25-hydroxy vitamin D concentration (0.6ng/ml and 0.78ng/ml respectively). There is no relationship between burning mouth syndrome and non- stimulated whole saliva or serum 25- hydroxy vitamin D concentration.

Key words: saliva, serum, 25-Hydroxy vitamin D.

Introduction:

Burning mouth syndrome (BMS) can be defined as pain and burning sensation of oral mucosa with absence of identifiable clinical abnormalities, the usually affected individuals are women at middle age. Many mucosal parts can be affected, but the anterior two-thirds and the tip of the tongue are the sites of predilection. Many associated symptoms may be found including dysgeusia, dry mouth and psychological problem [(1)]. The causative factors result in this syndrome include mouth infections, allergy, smoking, alcohol drinking, also systematic causes like changes in hormones associated with menopause, diabetes hypothyroidism and medications. Other factors are stress, depression, anxiety and fear from cancer) [(2- 4)]. The neuropathic origin in the etiology of BMS has been approved by more evidence [(5)]. Sensitivity of trigeminal nerve increases in response to thermal stimuli and abnormal perception in pre pain range, also disturbances in the neurovascular microcirculatory system of oral mucosa and alterations in neuronal transmission have been documented in patients with BMS. All those augment the neuropathic background of the disease [(6–8)]. BMS diagnosis requires taking detailed medical history, ascertaining of symptoms, examination of oral mucosa and laboratory tests (Vit. B12, CBC, Ferritin, FBS, TSH and test for allergy) [(2)]. Several modalities of treatment have been used like tricyclic anti-depressants, pilocarpine, estrogen therapy, antioxidants, capsaicin, anticonvulsants, and antifungal medications [(2, 9, 10)]. Vitamin D (the active form) which is (1,25 di hydroxylated), has hormonal activities in human being [(11)]. Vitamin D is converted to 25-(OH) D in the liver and after that it is converted to its more active form which is 1, 25-(OH) 2D in the kidneys. 1,25-(OH)2D facilitates calcium entrance to the cells of intestine against ions gradient [(11)]. It is found that 1, 25-(OH) 2D has a role in calcium dependent exocytosis of salivary protein

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and the deficiency of vitamin D may decrease parotid gland secretion [12-14]. Vitamin D deficiency is a world widely separated throughout different populations, including pregnant and lactating women, infants, elderly, persons living far from the equator, individuals with dark pigmentation of skin and those who avoid the sun and ultraviolet radiation in the blue spectrum [11].The purpose of this study was to estimate 25- hydroxy vitamin D levels in saliva and serum of individuals with and without burning mouth syndrome.

Materials and methods:

Subjects

Fifty seven individuals with age range of (48-62 years old) were enrolled in this study from teaching hospital of college of dentistry in Al Qadyssia University. Twenty eight individuals with burning mouth syndrome (BMS) served as a case group (mean age ± S.D was 58.2±5.3). The diagnosis of BMS was done according to the standardized clinical criteria [1].The inclusion criteria were depending on a characteristic complaint of tongue pain without other clinical signs. Twenty-nine healthy volunteers served as a control group (mean age ± S.D was 56.1±4.2). The exclusion criteria were including the presence of bone diseases like (osteoporosis and osteomalasia), also an individual taking vitamin D supplementation was excluded from the study. After medical and dental histories had been taken, approximately 5mL of non- stimulated whole saliva was collected from each participant into a sterile tube in sitting position [15]. Saliva samples were centrifuged at (3000 rpm for 10 minutes) and stored at −20°C for later analysis of 25-hydroxy vitamin D. About 5ml of blood was drown from each participant, centrifuged and the collected serum samples were stored also at −20°C until analysis. All the samples were stored inbiochemistry lab of college of medicine of Al Qadyssia University and thawed before assay. Depending on ELISA technology, the concentration of 25-hydroxy vitamin D in serum and saliva was determined by using commercially available kits (Germany).

Statistical analysis

The difference in age between control and case groups was illustrated by using mean and standard deviation. For comparison of serum and salivary 25- hydroxy vitamin D levels between the study groups, the Student's unpaired t-test was used. P value less than 0.05 was considered statistically significant.

Results:

The difference in mean age between study groups was statistically not significant (p= 0.07) Table (1). No significant difference was detected between case and control groups regarding serum 25-hydroxy vitamin D concentration (120 ng/ml and 114 ng/ml respectively) Fig.(1) and also non- stimulated whole salivary 25- hydroxy vitamin D concentration (0.6 ng/ml and 0.78 ng/ml respectively) Fig.(2).

Discussion:

Burning mouth syndrome (BMS) is a common condition which may affect life quality. The individuals usually present with several oral complaints, such as dry mouth, burning sensation and taste alterations [16]. Although the exact etiology of the disease remains unknown, depression is documented as a precipitating factor [16].The symptoms of the disease include burning tongue or other sites of oral mucosa without clinical and laboratory abnormalities. One of the common complaints is pain that indicate damage of tissue in response to various internal or external factors [1].

Changes in the nociceptive pathway of trigeminal nerve at central or peripheral nervous system in addition to psychological distress have been introduced in BMS which supports the neuropathic background of the disease [1]. The anterior two-thirds of the tongue, the lingual gingiva and floor of mouth are supplied by afferent fibers from lingual nerve (a branch of the mandibular

division) of the trigeminal nerve. Unmyelinated nerve fibers density is reduced in BMS which reflects negative relationship with only duration of pain and not pain severity [16-18]. The results of this study showed no significant difference in serum and un stimulated whole salivary 25- hydroxy vitamin D concentrations between the study and control group. Unfortunately, no previous studies have been conducted to measure serum and salivary 25- hydroxy vitamin D in individuals having burning mouth syndrome for comparison of the results. It seems that the concentration of serum and salivary 25- hydroxy vitamin D may be maintained in normal limits and have no correlation with burning mouth syndrome.
In a study by Agha-Hosseini et al., no significant difference was found in serum and stimulated whole saliva 25-hydroxy vitamin D concentrations between two groups of postmenopausal women with and without feeling of oral dryness and conclude that no correlation was found between serum and salivary 25-hydroxy vitamin D concentration and feeling of oral dryness in those women [19]. Vitamin D deficiency effect on parotid saliva of rats was detected in a study by Glijer et al [20]. In one study, salivary 25-hydroxy vitamin D found to play a role in absorption of calcium ions from intestinal mucosa in response to daily metabolic needs for calcium [12].

Conclusions:

Serum and non-stimulated whole salivary 25- hydroxy vitamin D levels may be maintained within normal limits and have no relationship with burning mouth syndrome.

Recommendations:

1- Further studies on large number of patients.
2- Estimation of salivary flow rate and other salivary parameters like enzymes to see if there is any change in these parameters in relation to burning mouth syndrome.

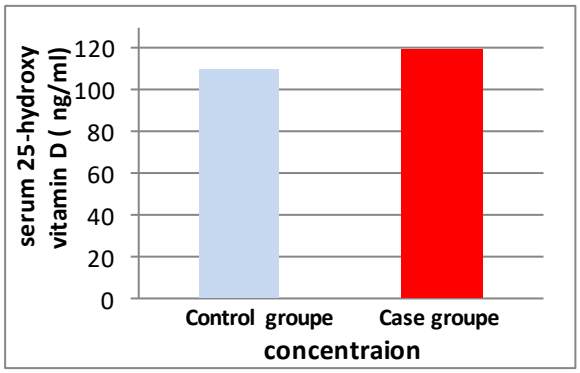

Fig.(1): Serum 25- hydroxy vitamin D concentration in study groups.

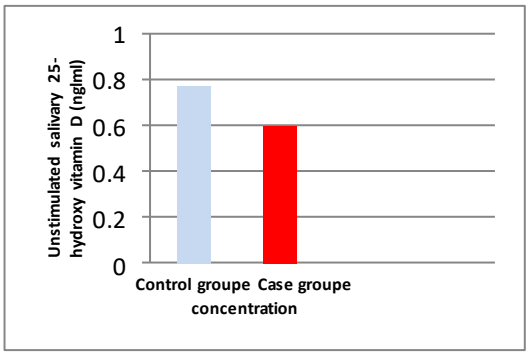

Fig.(2): Salivary 25- hydroxy vitamin D concentration in study groups.

Table (1): The difference in mean age between study groups**.**

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	Contr-ol group	Case group	P
Age mean (years)	56.1	58.2	0.07
S.D	4.2	5.3	
N	29	28	

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