Clinicopathological analysis of common oral lesions

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ABSTRACT

Background: Oral health is important to the quality of life of all individuals. Oral lesions can cause discomfort or pain that interferes with mastication, swallowing, and speech. Oral disease is a health problem that is not only a matter of oral hygiene and local condition, but can also be a precursor to other dangerous and potentially life threatening illnesses. The present study was designed to analyze the main clinicopathological aspects of most common oral lesions in patients who visit the Oral Diagnosis Clinic of the College of Dentistry, University of Sulaimani, Kurdistan region, Iraq.

Patients and methods: This prospective study was performed on 3144 patients from July 2009-July 2010. In this study a total of 3144 patients were examined. Of these 1507 (47.93%) were males and 1637 (52.06%) females. The patients' age ranged between 10 to 79 years. An interview was conducted to collect information using a structured questionnaire which was completed by each patient. The lesions that could not be diagnosed by clinical examinations alone were analyzed histopathologically.

Results: Among 3144 patients, only 799 patients (25.41%) had oral lesions. Females constituted 49.81% (n=398) and males 50.18 (n=401). The age range of the patients was between 10-79 years with a mean age of 33.75 years. Anatomic changes and developmental anomalies were considered as linea alba (16.68%), Fordyce's granules (12.37%), torus mandibularis (0.66%), torus palatinus (0.55%). Common oral lesions after those considered being anatomic changes and developmental anomalies were fissure tongue (18.23%), cheek biting (12.15%), hairy tongue (6.51%), and recurrent aphthous stomatitis (5.85%) , ankyloglossia (3.75%) , lingual varicosities (2.87%) , frictional (traumatic) keratosis (2.87%) , denture stomatitis (2.54%), recurrent herpes simplex virus infection (2.43%), traumatic ulcer (2.43%), geographic tongue (1.98%), fibroepithelial hyperplasia (1.32%), denture induced fibrous hyperplasia (1.21%) , angular cheilitis (0.99%) , oral lichen planus (0.88%) , median rhomboid glossitis (0.88%) , peripheral giant cell granuloma (0.22%) , and gingival hyperplasia (0.33%) .

Conclusion: Routine examinations of oral cavities are valuable in identifying several oral lesions and this will help to establish early diagnosis and treatment and better prognosis particularly early precancerous and other oral lesions.

Keywords: Abnormalities, oral mucosal lesions, clinicopathological. (J Bagh Coll Dentistry 2013; 25(2):101-107).

INTRODUCTION

Oral health is important to the quality of life of all individuals. Oral lesions can cause discomfort or pain that interferes with mastication, swallowing, and speech. Oral lesions can produce symptoms such as halitosis, xerostomia, or oral dysesthesia, which interfere with daily social activities [1]. Oral disease is a health problem that is not only a matter of oral hygiene and local condition, but can also be a precursor to other dangerous and potentially life threatening illnesses [2]. Diagnosis of wide variety of lesions that occur in the oral cavity is an essential part of dental practice. An important element in establishing a diagnosis is knowledge of the lesions' relative frequency, or prevalence at one point in time [3]. Among the broad spectrum of causes leading to changes in the oral mucosa are infections from bacteria, fungi, viruses, parasites, and other agents; physical and thermal influences, changes in the immune system, systemic diseases, neoplasia, trauma and other factors, some of which are issues of aging [4,5]. Traditionally, the mucosal membrane of the oral cavity has been looked upon as mirroring the general health [6].

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The tongue lesions fissured, geographic and hairy tongue, oral lesions Fordyce granules, and leukoedema are classically considered to be developmental oral lesions rather than having virtual disease characteristics [6]. These lesions may be present at birth or become evident later in life. They may be discovered during routine dental examinations and vary depending on age, gender and/or race [7].

Recurrent aphthous stomatitis is an ulcerative condition that affects the oral mucosa without evidence of an underlying medical disorder, or may be associated with other systemic diseases [8]. In particular, long-term habits such as using tobacco can cause precancerous or cancerous lesions [9]. Dental factors (poor oral hygiene, sharp teeth, and improperly fitting dentures) have been thought to play a role in the occurrence of oral mucosal lesions [4,10]. Denture wearers, besides suffering the characteristic lesions from the dentures, they present traumatic ulcerations with more frequency than nonusers, candidosis pathology occupying second place in frequency [11]. The present study was designed to analyze the main clinicopathological aspects of most common oral lesions in patients who visit the Oral Diagnosis Clinic of the College of Dentistry, University of Sulaimani.

PATIENTS AND METHODS

Evaluation basis: This prospective study was performed on 3144 patients, of these 1507 (47.93%) were males and 1637 (52.06%) were females. The patients' ages were between 10 to 79 years. All patients included in this study were referred to the Department of Oral Medicine, College of Dentistry, University of Sulaimani from July 2009-July 2010. The bases for attending to the clinic were to seek dental treatment.

Patients: An interview was conducted to collect information using a structured questionnaire which was completed by each patient and the examiner. Both dental and general medical histories of the patients were obtained.

Methods: The patients were examined clinically by two trained examiners using artificial light, mouth mirror, gauze. At the time of clinical examination, we established a preliminary diagnosis. Some of the mucosal changes where diagnosed solely by clinical examination (e.g. linea alba, fissured tongue, etc.). Some times a cotton swab was used to remove evident debris; a swab was always used to test whether a white lesion could be wiped off. In some cases where the observed lesion could be of traumatic origin, this was eliminated and the patients were requested to return for evaluation 15 days later for a new exploration. During the clinical examination, the following elements including features of the lesion, anatomical location, extension, etiological factors or related factors, dental status were analyzed. The diagnosis was made based on history, clinical features, and investigations according to the WHO (1997) criteria [12]. When clinical features were not diagnostic and where no clinical improvement was observed, a biopsy was undertaken.

RESULTS

Among 3144 patients examined, 905 oral lesions were diagnosed and their distribution was as follows:

Distribution of tongue disease according to age and sex in 905 oral lesions: Tongue lesions were considered as fissure tongue (18.23%), black hairy tongue (6.51%), ankyloglossia (3.75%), geographic tongue (1.98%) and scalloped tongue (0.33%) as shown in table (1).

Table 1: Distribution of tongue diseases according to age and sex in 905* oral lesions

Tongue Diseases	Sex	Age (y)							Subtotal n (%)	Total n (%)	% (905) lesions
		10-19	20-29	30-39	40-49	50-59	60-69	70-79			
Fissured tongue	Female	4	22	23	12	10	3	2	76 (46.06)	165 (-54.09)	18.23%
	Male	6	45	13	6	3	13	3	89 (53.93)		
Black hairy tongue	Female	0	3	3	0	6	0	1	13 (22.03)	59 (-19.34)	6.51%
	Male	0	21	7	5	4	5	4	46 (77.96)		
Ankyloglossia	Female	2	7	0	0	1	0	0	10 (29.41)	34 (-11.14)	3.75%
	Male	6	14	3	0	0	1	0	24 (70.58)		
Lingual varicosities	Female	0	0	2	4	5	0	0	11 (42.30)	26 (-8.52)	2.87%
	Male	0	0	0	0	Mad	Mom	0	15 (57.69)		
Geographic tongue	Female	2	7	2	0	0	0	0	11 (61.11)	18 (-5.9)	1.98%
	Male	0	7	0	0	0	0	0	mom (38.88)		
Scalloped tongue	Female	0	1	1	0	0	0	0	2 (66.66)	3 (-0.98)	0.33%
	Male	0	1	0	0	0	0	0	1 (33.33)		
Total	Female	Mad	40	31	16	22	3	3	123 (40.32)	305 (-100)	33.70%
	Male	12	88	23	11	15	26	8	182 (59.67)		

*Some patients had more than one lesion, so the number of lesions was more than the number of the patients

Distribution of anatomic changes and developmental anomalies according to age and sex in 905 oral lesions: Anatomic changes and developmental anomalies were considered as linea alba (16.68) followed by Fordyce's granules (12.37%), torus mandibularis (0.66%), and torus palatinus (0.55%) as shown in table(2).

Distribution of ulcerative, vesicular and bullous lesions according to age and sex in 905 oral lesions: The most common ulcerative lesion was RAS (5.85%) followed by recurrent herpes simplex virus infection and traumatic ulcer (2.43%) as shown in table (3).

Distribution of white lesions according to age and sex in 905 oral lesions: The most common white lesion was cheek biting (12.15%) followed by frictional keratosis (2.875%), oral lichen planus (0.88%) as shown in table (4).

Distribution of candidiasis according to age and sex in 905 oral lesions: The number of patients with denture stomatitis was 23, 18 patients were females whom constituted 78.26%

and 5 patients were males whom constituted 21.73%. The number of patients with angular cheilitis was 9, 4 patients were females whom constituted 44.44% and 5 patients were males whom constituted 55.55% as shown in table (5).

Distribution of benign lesions according to age and sex in 905 oral lesions: The most common benign lesion was fibroepithelial hyperplasia (1.32%) followed by denture induced fibrous hyperplasia (1.21%) as shown in table (6).

Table 2: Distribution of normal structural variants according to age and sex in 905* oral lesions

Normal structural variants	Sex	Age (y)							Subtotal n (%)	Total n (%)	% (905) lesions
		10-19	20-29	30-39	40-49	50-59	60-69	70-79			
Linea alba (White line)	Female	8	51	24	Mad	5	0	0	96 (63.57)	151 (-55.1)	16.68%
	Male	5	28	17	3	1	1	0	55 (36.42)		
Fordyce's granules	Female	0	9	7	Mom	5	2	0	30 (26.78)	112 (-40.87)	12.37%
	Male	1	32	22	10	9	7	1	82 (73.21)		
Torus mandibularis	Female	0	2	1	2	0	0	0	5 (83.33)	6 (2.18)	0.66%
	Male	0	0	0	1	0	0	0	1 (16.66)		
Torus palatinus	Female	0	2	1	2	0	0	0	5 (100)	5 (1.82)	0.55%
	Male	0	0	0	0	0	0	0	0 (00.00)		
Total	Female	8	64	33	19	10	2	0	136 (49.63)	274 (100)	30.27%
	Male	6	60	39	14	10	8	1	138 (50.36)		

Table 3: Distribution of ulcerative, vesicular and bullous lesions according to age and sex in 905* oral lesion

Ulcerative, vesicular and Bullous lesions	Sex	Age(y)							Subtotal n (%)	Total n (%)	% (905) lesions
		10-19	20-29	30-39	40-49	50-59	60-69	70-79			
Recurrent aphthous - stomatitis	Female	6	16	3	2	2	0	0	29 (54.71)	53 (-53.53)	5.85%
	Male	2	17	2	3	0	0	0	24 (45.28)		
Recurrent herpes – simplex virus infection	Female	2	6	1	2	1	0	0	12 (54.54)	22 (-22.22)	2.43%
	Male	1	7	2	0	0	0	0	10 (45.45)		
Traumatic ulcer	Female	1	3	1	4	4	0	1	14 (63.63)	22 (-22.22)	2.43%
	Male	0	5	2	0	0	1	0	8 (36.36)		
Behçet's Syndrome	Female	0	0	0	0	0	0	0	0 (00.00)	1 (-1.01)	0.11%
	Male	0	0	0	0	1	0	0	1 (100)		
Erythema Multiforme	Female	0	0	1	0	0	0	0	1 (100)	1 (-1.01)	0.11%
	Male	0	0	0	0	0	0	0	0 (00.00)		
Total	Female	9	25	6	8	7	0	1	56 (56.56)	99 (-100)	10.93%
	Male	3	29	6	3	1	1	0	43 (43.43)		

Table 4: Distribution of white lesions according to age and sex in 905* oral lesions

White Lesions	Sex	Age (y)							Subtotal n (%)	Total n (%)	% (905) lesions
		10-19	20-29	30-39	40-49	50-59	60-69	70-79			
Cheek Biting	Female	2	37	18	Mom	2	0	0	66 (60)	110	12.15%
	Male	1	34	6	3	0	0	0	44 (40)	-72.84	
Frictional (traumatic) keratosis	Female	0	6	1	3	2	0	0	12(46.15)	26	2.87%
	Male	1	7	5	0	1	0	0	14(53.84)	-17.21	
Oral lichen Planus	Female	0	1	1	1	2	0	0	5 (62.5)	8	0.88%
	Male	0	2	0	0	0	1	0	3(37.5)	-5.29	
Leukoplakia	Female	0	0	0	0	0	0	0	0 (00.00)	3	0.33%
	Male	0	1	0	1	0	1	0	3 (100)	-1.98	
Nicotine Stomatitis	Female	0	0	0	0	1	0	0	1 (50)	2	0.22%
	Male	0	0	0	0	1	0	0	1 (50)	-1.32	
Actinic keratosis (cheilitis)	Female	0	0	0	0	0	0	0	0 (00.00)	1	0.11%
	Male	0	0	0	0	0	1	0	1 (100)	-0.66	
Lichenoid Reaction	Female	0	0	0	0	0	0	0	0 (00.00)	1	0.11%
	Male	0	1	0	0	0	0	0	1 (100)	-0.66	
Total	Female	2	44	20	11	7	0	0	84(55.62)	151 (100)	16.68%
	Male	2	45	11	4	2	3	0	67(44.37)		

Table 5: Distribution of candidiasis according to age and sex in 905* oral lesions

Candidiasis	Sex	Age (y)							Subtotal n (%)	Total n (%)	% (905) lesions
		10-19	20-29	30-39	40-49	50-59	60-69	70-79			
Denture stomatitis	Female	0	0	2	6	5	2	3	18 (78.26)	23	2.54%
	Male	0	0	1	0	1	3	0	5 (21.73)	-56.09	
Angular cheilitis	Female	0	4	0	0	0	0	0	4 (44.44)	9	0.99%
	Male	1	0	0	2	0	2	0	5 (55.55)	-21.95	
Median rhomboid glossitis	Female	0	0	0	0	2	0	0	2 (25)	8	0.88%
	Male	0	2	1	2	0	1	0	6 (75)	-19.51	
Thrush	Female	0	0	0	0	1	0	0	1 (100)	1	0.11%
	Male	0	0	0	0	0	0	0	0(00.00)	-2.43	
Total	Female	0	4	2	6	8	2	3	25 (60.97)	41	4.53%
	Male	1	2	2	4	1	6	0	16 (39.02)	-100	

Table 6: Distribution of benign lesions according to age and sex in 905* oral lesions

Inflammatory (reactive) hyperplasia	Sex	Age							Subtotal n (%)	Total (%)	% (905) lesions
		10-19	20-29	30-39	40-49	50-59	60-69	70-79			
Fibro epithelial hyperplasia	Female	0	3	2	1	0	1	0	7 (58.33)	12 -(35.29)	1.32%
	Male	0	3	0	0	1	0	1	5 (41.66)		
Denture induced fibrous hyperplasia	Female	0	0	0	1	3	1	5	10 (90.90)	11 (-32.35)	1.21%
	Male	0	0	0	1	0	0	0	1 (9.09)		
Peripheral giant cell granuloma	Female	0	0	0	0	0	0	0	0 (00.00)	2 (-5.88)	0.22%
	Male	1	0	0	0	0	1	0	2 (100)		
Gingival hyperplasia	Female	0	0	0	0	0	0	0	0 (00.00)	3** (-8.82)	0.33%
	Male	1	2	0	0	0	0	0	3 (100)		
Mucoceles	Female	0	0	0	1	0	0	0	1 (33.33)	3 (8.82)	0.33%
	Male	1	1	0	0	0	0	0	2 (66.66)		
Radicular cyst	Female	0	1	0	0	0	0	0	1 (50)	2 (-5.88)	0.22%
	Male	0	0	1	0	0	0	0	1 (50)		
Port wine stain	Female	0	0	0	0	0	0	0	0 (00.00)	1 (-2.94)	0.11%
	Male	0	0	0	1	0	0	0	1 (100)		
Total	Female	0	4	2	3	3	2	5	19 (55.88)	34 (-100)	3.75%
	Male	3	6	1	2	1	1	1	15 (44.11)		

**1case is hereditary gingival fibromatosis and 2 cases are drug induced

DISCUSSION

Among 3144 patients, only 799 patients (25.41%) had oral lesions. Females constituted 49.81% (n=398) and males 50.18 (n=401). The age range of the patients was between 10-79 years with a mean age of 33.75 years. Tongue lesions were considered as fissure tongue (18.23%), black hairy tongue (6.51%), ankyloglossia (3.75%), geographic tongue (1.98%) and scalloped tongue (0.33%). The most common tongue lesion was fissured tongue, the number of patients with fissured tongue was 165, 76 patients (46.06%) were females and 89 patients (53.93%) were males. This is compatible with other studies done by Mathew *et al.* [13] in southern India, and Mojarrad and Vaziri [14] in which fissured tongue was more common among males. The commonly affected age group (40.60%) was between 20-29 years, this is compatible with Neville *et al.* [15] in which fissured tongue may be seen in children or adults, but the prevalence and severity appear to increase with age and disagrees with the study done by Mathew *et al.* [13] in southern India in which 41-60 years of age were the most common affected age group. The number of patients with geographic tongue was 18, 11 patients (61.11%) were females and 7 patients (38.88%) were males. The most commonly affected age group was 20-29 years, this is compatible with the study done by Jainkittivong and Langlais in which geographic tongue was more common among females and the highest incidence (39.4%) occurred in the 20-29 age groups [16]. Anatomic changes and developmental anomalies were considered as linea alba (16.68) followed by Fordyce's granules (12.37%), torus mandibularis (0.66%), and torus palatinus (0.55%). we did not compare our results with other studies because there was no studies about the clinicopathological aspect of these lesions, as these lesions are almost always analyzed in a prevalence study either alone or with other lesions.

The most common white lesion was cheek biting (12.15%) followed by frictional keratosis (2.875%) and oral lichen planus (0.88%). The number of patients with cheek biting was 110, 66 patients (60%) were females and 44 patients (40%) were males. The most commonly affected age group (64.54%) was between the ages of 20-29 years; this is compatible with other studies done by Neville *et al.* [15] and Cebeci *et al.* [9] in which cheek biting was more common among females. The number of patients with frictional (traumatic) keratosis was 26, 12 patients (46.15%) were females and 14 patients (53.84%) were males. The most commonly affected age group (50%) was between the ages of 20-29 years, this is compatible with other studies done by Mathew *et al.* [13] and Cebeci *et al.* [9] in which frictional (traumatic) keratosis was more common among males and the most commonly affected age group was between 21-40 years. The number of patients with oral lichen planus was 8, 5 patients (62.5%) were females and 3 patients (37.5%) were males. The most commonly affected age group (37.5%) was between the ages of 20-29 years with mean age of 41.62, this is compatible with other studies that were done by Pakfetrat *et al.* [17] in which lichen planus was more common among females. This study is compatible with other studies done by Pakfetrat *et al.* [17] in which OLP was more prevalent in third to fourth decades of life and disagrees with the finding of Oliveira Alves *et al.* [18] in which a predominance of OLP was observed in the fifth, sixth and seventh decades of life. The majority of the oral lichen planus (50%) were seen in the buccal mucosa, followed by tongue (28.56%), anterior gingiva (7.14%), retromolar pad area (7.14%) and alveolar ridge (7.14%) in a descending order. This is in agreement with other studies done by Pakfetrat *et al.* [17] and Oliveira Alves *et al.* [18], in which buccal mucosa was the site most affected, followed by the tongue and gingiva.

The most common ulcerative lesion was RAS (5.85%) followed by recurrent herpes simplex virus infection and traumatic ulcer (2.43%). The number of patients with recurrent aphthous stomatitis was 53, 29 patients (54.71%) were females and 24 patients (45.28%) were males. The most commonly affected age group (62.26%) was between the ages of 20-29 years, this is compatible with other studies in which recurrent aphthous ulcers were more common among females Gaphor and Hussien, [19]. The majority of the minor recurrent aphthous ulcerations (33.87%) were seen in the lower lip, followed by the mucobuccal fold area (20.96), buccal mucosa (17.74%), lateral tongue (8.06%), upper lip (8.06%), tip of tongue (6.45%), and ventral tongue (4.83%) in a descending order. This is in agreement with Gaphor and Hussien, which stated that minor aphthous ulcers were found in non-keratinized mobile mucosa of the oral cavity [19].

The number of patients with denture stomatitis was 23, 18 patients (78.26%) were females and 5 patients (21.73%) were males, this is compatible with other studies done by Baena-Monroy *et al.* in which they confirm that stomatitis mainly affects women [20] . The most commonly affected age groups (26.08%, 26.08%) were between 40-49, and 50-59 years, they were also a little bit younger than the patients of other studies Vitkov and Lugstein [21] and Baena-Monroy *et al.*[20] in

which they confirm that stomatitis affects mainly elderly.

The most common benign lesion was Fibroepithelial hyperplasia (1.32%) followed by denture induced fibrous hyperplasia (1.21%). The number of patients with Fibroepithelial hyperplasia was 12, 7 patients (58.33%) were females and 5 patients (41.66%) were males. This is compatible with other studies done by Awange *et al.* in which Fibroepithelial hyperplasia was more common among females [22]. The most commonly affected age group (50%) was between 20-29 years, this is compatible with another study done by Nartey *et al.* in which focal febrous hyperplasia (fibroma) was occurring over a wide age range, with a peak incidence in the third decade[23]. The majority of the Fibroepithelial hyperplasis (50%) were seen in the buccal mucosa, followed by tongue (16.66%), lip (16.66%), gingiva 8.33% and alveolar ridge (8.33%) in a descending order. This is in agreement with other studies done by Neville *et al.* in which the most common location for irritational fibroma was the buccal mucosa along the bite line [15]. In our study the number of patients with denture induced fibrous hyperplasia was 11, 10 patients (90.90%) were females and 1 patient (9.09%) was male which agree with Coelho *et al.* [24] and Nevalainen *et al.* [25]. In this study, the majority of the denture induced fibrous hyperplasia (58.82%) were seen in the lower jaw than the upper jaw (41.17%), IFH occurs at a higher rate in the maxilla Xie *et al.*, [26]; Coelho *et al.* [24] than in the mandible. This situation may be explained by the fact that the area of mucosa covered by a denture is greater in the maxilla than the mandible, so the pressure being inserted to the underlying mucosa is higher in the maxilla Canger *et al.* [27]. In this study, the anterior region of the jaws was more affected (76.47%) than the posterior regions (23.52%). The anterior regions of the jaws are more often affected by IFH than the posterior regions Xie *et al.* [26]. Similar results were found in a study of these lesions in a population of Turkey Canger *et al.* considering that 77.5% of IFH were in the anterior region [27].

As conclusion, routine examinations of oral cavities are valuable in identifying several oral lesions and this will help to establish early diagnosis and treatment and better prognosis.

REFERENCES

1. Triantos Dimitris. Intra-oral findings and general health conditions among institutionalized and non-institutionalized elderly in Greece. J Oral Pathol Med 2005; 34 (10): 577 – 582.
2. Soames JV, Southam EJ. Oral Pathology. 4th ed. New York: Oxford University press Inc; 2005.
3. Shulman JD, Beach MM, Rivera-Hidalgo F .The prevalence of oral mucosal lesions in U.S. adults Data from the Third National Health and Nutrition Examination Survey, 1988-1994. J Am Dent Assoc 2004; 135: 1279-86.
4. Reichart PA . Oral mucosal lesions in a representative cross-sectional study of aging Germans. Community Dent Oral Epidemiol 2000; 28(5): 390-8.
5. Jainkittivong A, Aneksuk V, Langlais RP. Oral mucosal conditions in elderly dental patients. Oral Dis. 2002; 8(4): 218-23
6. Jahanbani J, Sandvik L, Lyberg T, Ahlfors E . Evaluation of Oral Mucosal Lesions in 598 Referred Iranian Patients. The Open Dent J 2009; 3: 42-47.
7. Reichart PA. Oral mucosal lesions in a representative cross sectional study of aging Germans. Community Dent Oral Epidemiol.2000; 28(5): 390-8.
8. Bornstein MM, Suter VG, Stauffer E, Buser D. The CO_2 Laser in Stomatology: part 2. Schweiz Monatsschr Zahnmed 2003; 113(7): 766-85.
9. Cebeci ARI, Gulsahi A, Kamburoglu K, Orhan BK, Oztas B. Prevalence and distribution of oral mucosal lesions in an adult Turkish population. Med Oral Patol Oral Cir Bucal 2009; 14(6): E272-7.
10. Campisi G, Margiotta V . Oral mucosal lesions and risk habits among men in an Italian study population. J Oral Pathol Med.2001; 30(1): 22-8.
11. Martínez AI, García-Pola MJ . Epidemiological study of oral mucosal pathology in patients of the Oviedo School of Stomatology. Med Oral 2002; 7(1): 4-16.
12. WHO Oral health surveys, basic methods, Criteria for the examination of the oral mucosa and soft tissues. 4th ed. England; 1997. p. 1-66.
13. Mathew AL, Pai KM, Sholapurkar AA, Vengal M. The prevalence of oral mucosal lesions in patients visiting a dental school in Southern India. Indian J Dent Res 2008; 19(2): 99-103.
14. Mojarrad F, Vaziri P Bakianian . Prevalence of Tongue Anomalies in Hamadan, Iran. Iranian J Publ Health 2008; 37(2): 101-105.
15. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Pathology. 2nd ed. Philadelphia: Saunders; 2002.
16. Jainkittivong A, Langlais RP. Geographic tongue: clinical characteristic of 188 cases. J Contemp Dent Pract 2005; 6(1):123-35.
17. Pakfetrat Atessa, Javadzadeh-Bolouri Abbas, Basir-Shabestari Samira, Falaki Farnaz . Oral lichen planus: A retrospective study of 420 Iranian patients. Med Oral Patol Oral Cir Bucal 2009; 14(7):E315-8.
18. Oliveira Alves Mônica Ghislaine, Almeida Janete Dias, Balducci Ivan, Cabral Luiz Antonio Guimarães . Oral lichen planus: A retrospective study of 110 Brazilian patients. BMC Res Notes 2010; 3:157.
19. Gaphor Sh. M, Hussien Sh. A. Clinical observation of recurrent aphthous stomatitis in Sulaimania. J Bagh Coll Dentistry 2009; 21(1): 74-79.
20. Baena-Monroy T, Moreno-Maldonado V, Franco-Martinez F, Aldape- Barrios B, Quinds G, Sanchez-Vargas LO. Candida albicans, Staphylococcus aureus and Streptococcus mutans colonization in patients wearing dental prosthesis. Med Oral Patol Oral Cir Bucal 2005; 10: E27-E39.
21. Vitkov L, Lugstein A. Glycaemic disorders in denture stomatitis. J Oral Pathol Med 1999; 28: 406-409.

22. Awange DO, Wakoli KA, Onyango JF, Chindia ML, Dimba EO, Guthua SW. Reactive localized inflammatory hyperplasia of the oral mucosa. East Afr Med J 2009; 86(2): 79-82.
23. Narty N, Masadomi H, Al-Gilani M, Al-Mobeerik A . Localized inflammatory hyperplasia of the oral cavity: clinico-pathological study of 164 cases. Saudi Dent J 1994; 6(3): 145-50.
24. Coelho CMP, Sousa TCS, Dare AMZ . Denture-related oral mucosal lesions in a Brazilian school of dentistry. J Oral Rehabil 2004; 31:135-139.
25. Nevalainen MJ, Narhi TO, Ainamo A. Oral mucosal lesions and oral hygiene habits in the home-living elderly. J Oral Rehabil 1997; 24:332-337.
26. Xie Q, Ainamo A, Tilvis R . Association of residual ridge resorption with systemic factors in home-living elderly subjects. Acta Odontol Scand 1997; 55:299-305.
27. Canger EM, Celenk P, Kayipmaz S . Denture-related hyperplasia: a clinical study of a Turkish population group. Braz Dent J 2009; 20(3): 243-8.