

# Evaluation of Rates and Demographic Properties of Oral Mucosal Disease in Children

## Çocuklarda Oral Mukoza Hastalıklarının Oranı ve Demografik Özelliklerinin Değerlendirilmesi

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### ABSTRACT

**Objective:** Our aim was to determine the frequency and demographic characteristics of the patients presenting at the department of pediatric dermatology with complaints of mouth and lip lesions and to compare their epidemiological data with the literature in this study.

**Material and Methods:** Of the 3000 children aged between 0 and 16 who presented at the pediatric dermatology outpatients between 2011 January and 2011 December, the children who had been brought with complaints of mouth and lip sores were retrospectively assessed in terms of age, gender, socio-economic level (SEL), medicine use, disease history, systemic disease and presence of genetic disease.

**Results:** Of the pediatric patients brought with mouth complaints, 64 (58%) were girls and 46 (42%) were boys. Fifteen different oral mucosal diseases were detected in 110 patients (3.6%). The most frequent oral mucosal diseases were RAS (recurrent aphthous stomatitis) (16.3%, n=18), perioral dermatitis (14.5%, n=16), and hand foot mouth disease (13.6%, n= 15).

**Conclusion:** Although oral mucosal diseases are less frequently seen in children compared to adults, early diagnosis and treatment are important since they may be a sign of systemic disease, affect growth and development and may lead to psychological problems.

**Key Words:** Child, Epidemiology, Oral mucosa, Prevalence, Aphthous stomatitis

### ÖZET

**Amaç:** Bu çalışmada, pediatrik dermatoloji bölümüne ağız ve dudak şikayeti ile başvuran hastaların sıklığı, demografik özelliklerinin belirlenmesi ve olguların epidemiyolojik verilerinin literatür ile karşılaştırılması amaçlandı.

**Gereç ve Yöntemler:** Ocak -Aralık 2011 tarihleri arasında Pediatrik Dermatoloji Polikliniğine başvuran 0-16 yaş arasındaki 3000 çocuk retrospektif olarak incelendi. Bunlardan ağız ve dudaklarda yakınmayla getirilen 110 çocuk; yaş, cinsiyet, sosyo-ekonomik düzey ilaç kullanımı, geçirdiği hastalıklar, sistemik hastalık, genetik hastalık varlığı ve demografik özellikler açısından değerlendirildi. Tanı ve eşlik eden hastalıklara yönelik yapılan laboratuvar tetkikleri kaydedildi. Hastalar demografik verilere ve tanılarına göre gruplandırıldı.

**Bulgular:** Ağız yakınmalarıyla getirilen çocuk hastaların 64'ü kız (%58), 46'sı erkek (%42)'ti. Yüz on hastada (%3.6) 15 çeşit oral mukoza hastalığı saptandı. Yaş gruplarına göre yapılan değerlendirmede oral mukoza hastalıklarının %17.2'si (n=19) 0-2 yaşta, %26.9'ü (n= 29) 3-5 yaşta, %36.3'ü (n=40) 6-11 yaşta, %20.1'i (n=22) 11-16 yaşta görülmüştür. Çocuklarda oral mukoza hastalıkları içinde en sık rekürren aftöz stomatit (RAS) % 16.3 (n=18), perioral dermatit %14.5 (n=16), el ayak ağız hastalığı %13.6 (n= 15) saptandı.

**Sonuç:** Çocuklarda oral mukoza hastalıkları, sistemik bir hastalığın belirtisi olabilmesi, büyüme ve gelişmeyi etkilemesi ve psikolojik sorunlara yol açabilmesi nedeniyle daha iyi tanınmalı, tedaviye erken başlamalıdır.

**Anahtar Sözcükler:** Çocuk, Epidemiyoloji, Oral mukoza, Prevalans, Aftöz stomatit

## INTRODUCTION

Oral mucosa not only plays a passive role in motor functions such as speaking, swallowing or chewing; but also has tasks such as secretion, sensory perception or resorption. Oral lesions can be hints for many systemic and skin diseases. Oral cavity pathologies include more than 200 diseases consisting of mucosa-specific diseases, signs of some systemic diseases, genetic diseases and side effects of drugs (1). In infants and children, oral mucosa causes difficulties in nourishment and also adversely affects growth, development and body resistance. Studies on oral mucosal diseases during childhood are not quite satisfactory. In this study, it was aimed to retrospectively determine the frequency and distribution of oral mucosal diseases in a pediatric hospital in Ankara to which a great number of patients are admitted from nearby cities.

## MATERIAL and METHODS

The records of the patients aged between 0 and 16 who had admitted to the Pediatric Dermatology Polyclinic of the Ankara Pediatric Hematology Oncology Hospital between January and December 2011 with lip and mouth complaints were retrospectively assessed. Permission from the ethics committee was taken for the study. Examination findings and laboratory investigations for diagnosis were recorded. The patients were analyzed in four categories to compare the distributions by demographics and diagnoses: 0-2 years of age (infantile period), 3-5 years of age (preschool period), 6-11 years of age (school age period), and 12-16 years of age (adolescent period)

A statistical analysis Fisher Crosstab Statistics was used to compare the categorical variables with SPSS Version-20 program, and Chi-Square test was used to determine statistical difference. Statistical difference limit was determined to be  $p < 0.05$ .

## RESULTS

Table I shows the distribution of oral mucosal disease detected in the patients by gender. Of the patients with oral mucosal disease who were included in the study, 64 (58%) were girls and 46 (42%) were boys. Girls to boys ratio was 1.3.

When compared according to gender, RAS, perioral dermatitis, herpes labialis, mollusqum contagiosum, verruca vulgaris, glossitis, candidiasis and impetigo were more frequent in girls while hand foot mouth disease, cheilitis, angioedema and lichen planus were more frequent in boys.

In 110 patients, 15 different oral mucosal disorders were detected. Lip and lip contour lesions were also included in oral mucosal diseases. The most frequent oral mucosal diseases were RAS (16.3% (n=18), peroral dermatitis (14.5% (n=16)), hand foot mouth disease (13.6% (n= 15)) (Table II).

Of the oral mucosal diseases, 17.2% (n=19) were seen in 0-2 years of age, 26.9% (n= 29) were seen in 3-5 years of age, 36.3% (n=40) were seen in 6-11 years of age, and 20.1% (n=22) were seen in 11-16 years of age.

Presence of an accompanying systemic disease in 29 (26.3%) of the children with oral mucosal disorder (Table III).

**Table I:** Distribution of the most frequently detected oral mucosal disorders by gender.

Name of Disease	Number (girls)	%*	Number (boys)	%*	Total
RAS	12	66.6	6	33.3	18
Perioral dermatitis	9	56	7	44	16
Hand foot mouth disease	6	40	9	60	15
Cheilitis	5	35.7	9	64.2	14
Herpes labialis	9	75	3	25	12
Verruca vulgaris	9	90	1	10	10
Angioedema	2	28.5	5	71.4	7
Impetigo	3	75	1	25	4
Mollusqum contagiosum	3	60	2	40	5
Glossitis	2	100	-	-	2
Candidiasis	2	100	-	-	1
Lichen planus	-	-	2	100	2
Traumatic ulcer	1	100	-	-	1
Nevus	-	-	1	100	
Mucocele	1	100	-	-	1
<b>Total</b>	<b>64</b>	<b>58</b>	<b>46</b>	<b>42</b>	<b>110</b>

\*The percentages show the incidence rate of the diseases by gender.

**Table II:** Distribution of oral mucosal diseases by age group.

Name of Disease	No. of Patients	Total n= 3000%	Within Group (%)	0 – 2 years of age		3 – 5 years of age		6 – 11 years of age		12 – 16 years of age	
				n	17.2%	n	29%	n	36.3%	n	22%
<b>RAS</b>	18	0.6	16.3	-	-	2	6.8	5	12.5	11	50
<b>Perioral Dermatitis</b>	16	0.5	14.5	5	26.3	4	13.7	6	15	1	4.5
<b>Hand foot mouth disease</b>	15	0.5	13.6	5	26.3	6	20.6	4	10	-	-
<b>Cheilitis</b>	14	0.4	12.7	3	15.7	3	10.3	7	17.5	1	4.5
<b>Herpes Labialis</b>	12	0.4	10.9	1	5.26	-	-	6	12.5	5	22.7
<b>Verruca Vulgaris</b>	10	0.3	9.09	-	-	6	20.6	1	2.5	3	13.6
<b>Anjiodem</b>	7	0.2	6.3	-	-	3	10.3	3	7.5	1	4.5
<b>Mollusqum</b>	5	0.16	4.5	-	-	2	6.8	3	7.5	-	-
<b>Impetigo</b>	4	0.13	3.6	2	10.5	1	3.4	1	2.5	-	-
<b>Glossitis</b>	2	0.06	1.8	1	5.26	1	3.4	-	-	-	-
<b>Lichen Planus</b>	2	0.06	1.8	-	-	-	-	2	5	-	-
<b>Candidiasis</b>	2	0.06	1.8	1	5.26	-	-	1	2.5	-	-
<b>Traumatic Ulcer</b>	1	0.03	0.9	1	-	-	-	-	-	-	-
<b>Nevus</b>	1	0.03	0.9	-	-	1	3.4	-	-	-	-
<b>Mucocele</b>	1	0.03	0.9	-	-	-	-	1	2.5	-	-
	110	3.6	10	19	100	29	100	40	100	22	100

## DISCUSSION

Oral mucosal diseases in children are not rarely seen and their incidence rates vary between 2.3 % and 64% (2-5). In our country, a small number of studies were conducted on this and the rates vary between 13.7% and 26% (6,7). In this retrospective study conducted on 3000 pediatric patients, we found the frequency of oral mucosal diseases to be 3.6%, which is inconsistent with the rates in our country. This can be explained by the fact that the rates are higher in the studies conducted for screening purposes.

The most frequently seen oral mucosa lesion in our study was RAS. RAS is an acute, spontaneously recovering disorder in oral mucosa which is seen quite frequently, affecting 10%-25% of the population. Some investigators claim that prevalence may rise up to 50% in certain populations (8). Girls are affected three times more than boys (9). Also in our study, girls predominated at a rate of 66%.

It appears at ages between 10 and 30, and recurs at various intervals during the lifetime (10,11). The incidence is high at ages between 10 and 19. Also in our study, 88% of the pediatric patients with RAS were detected at the age range of between 11 and 16. Although in Argentina Crivelli observed this disorder more frequently in those with high SEL, there was no difference in our study (12). 30 % to 40% of the patients with RAS have family history (11). In 4 of our cases (22%) had family history.

In the occurrence of aphthae, local factors such as trauma, systemic diseases, genetic, immunological and microbial factors, stress, food, drugs, hormonal factors, and vitamin and mineral deficiencies play a role (9,13). In our study, there were cases with RAS who have anemia, gastritis, glycogen storage disease and Behcet's disease history. In the literature, incidences of RAS in children were reported at different rates from 0.09% to 14.8% (3,14-16). In our country the incidence is between 0.07% and 3.6% (7,17,18). In our study, RAS was detected in 0.6% of the examined children and in 16.3% of those who have oral mucosal disease. Additionally, although herpetic aphthae are not frequently seen, herpetic aphthae was detected in one case. Ambika et al. (5) found the rate of herpetic aphthae to be 0.1% .

Perioral dermatitis, which is more frequently seen in atopic children, is a condition different from perioral granulomatous dermatitis. It appears around lips in the form of allergic or irritant contact dermatitis, and dry skin makes the condition easier to develop (11).

Perioral dermatitis may develop in the form of allergic contact dermatitis due to licking lips, sucking fingers, lollipops, acidic foods, breathing through mouth, or in the form of irritant contact dermatitis due to continuous salivation, or allergic contact dermatitis due to toothpastes, gums, oral rinses, drugs or cosmetics (19). In our study, we have also seen conditions which may cause perioral dermatitis such as atopic dermatitis seborrheic dermatitis, or acrodermatitis enteropathica. While in

**Table III:** Presence of accompanying diseases in children with oral mucosal disorder.

Name of Disease	Accompanying Diseases	No. of Patients
<b>RAS</b>	Epilepsy	1
	Asthma	1
	Mold allergy	1
	Glycogen storage disease	1
	Anemia	1
	Gastritis	1
	Acute rheumatic fever	1
	Behcet's disease	1
<b>Perioral dermatitis</b>	Irritant contact dermatitis	1
	Atopic dermatitis	1
	Zinc deficiency (acrodermatitis enteropathica)	1
	Perianal dermatitis	1
	Allergic contact dermatitis	1
<b>Angioedema</b>	Chronic urticaria	2
	Acute urticaria	2
<b>Herpes</b>	Henoch Schlein Purpura	1
	Erythema polymorph	1
	Sinusitis	1
<b>Cheilitis</b>	Seborrheic dermatitis	1
	Perianal dermatitis	1
	Nail disorder	1
<b>Moluscum Contagiosum</b>	Atriseptal defect	1
<b>Hand foot mouth disease</b>	Vesicoureteral reflux	1
<b>Candidiasis</b>	Degenerative brain disease	1
<b>Lichen planus</b>	Aplastic anemia	1
	Asthma	1
<b>Nevus</b>	Acute myelocytic leukemia	1

the literature the rate of perioral dermatitis were determined to be 0.19% by Nanda et al.(20) and 0.15% by Sardana et al. (21), we observed its rate to be 0.5%. This rate is similar to that observed by Tamer et al. (17), which is 0.04%.

Hand foot disease is a condition associated with poor hygiene and with coxackie virus16 and enterovirus 71, which can be epidemic especially under 5 years of age and characterized by vesicles on hands, feet and mouth. In the world, its prevalence is 144/100 000 and 3066/100 000 for those under 5 years of age (22). While Kose et al. (7) found its prevalence to be 0.038% and frequency to be 3%, we found in our study 0.5% overall and 16% among oral diseases.

Cheilitis is characterized by inflammation, ulceration and fissures on the lips due to exogenous causes. Dryness and fissuration are the most frequently seen causes, and are among the signs of atopic dermatitis. It can be caused by allergic irritation and or artifacts (8,23). While the rate of anguler cheilit was found to be 9% by Parlak et al. (18), we found its rate to be 12.7%.

Herpes labialis is caused by HSV type I. This disease, more frequently seen at the ages between 10 months and 5 years, is triggered by factors such as stress, fever, immunosuppression, trauma, sunlight or cold weather. Recurrent HSV infection is seen at rates between 16% and 45%. Secondary lesions generally appear on the mucocutaneous junction of the lips (11,24). In the literature, herpes labialis rates vary between 0.05% and 9.3% (5,14,15,20,25). In our country, its rates vary between 0.015% and 1.5% (7,26, 27). Herpes labialis was detected in 0.4% of all patients in our study. Similarly to Ambika and Civelli, we observed herpes labialis more frequently in suburbans with low SEL (5,12).

Verruca vulgaris lesions are well-circumscribed lesions caused by HPV and are seen more frequently in children and adolescents, appearing on the lip mucosa, at the junction with the skin (11). Verruca vulgaris is generally seen at rates between 5% and 33% (23). While its rates were found to be 3.2% by Gürsoy et al.(26) and 2.9% by Baysal et al.(27), we found it to be 9%. Focal epithelial hyperplasia, also known as Heck's

disease, is caused by HPV 13 and characterized by nodular multiple lesions near lower lip commissures. We observed this disease in only one of our cases while it is seen at rates as high as 20% in Indians (4).

Urticaria and angioedema is characterized by dermis swelling accompanied with transient erythema, edema and itching. Subcutaneous and submucosal swelling is seen in angioedema. Urticaria is seen in at a rate of 10% in children. While 40% to 85% of all cases are urticaria in children aged below 16, angioedema is seen at rates between 6% and 40% and both urticaria and angioedema are seen at rates between 9% and 11% (28). Some authors report that 50% of the patients with angioedema also have urticaria (11). In our study, we detected angioedema in 6.3% of the patients and 57% of these had history of urticaria.

Mollusqum contagiosum is caused by Pox viruses. Although frequently seen on the skin, it is rare in the oral mucosa. They can be appear more frequently on the lip mucosa, at the junction with the skin. These are well-circumscribed lesions. They spread through direct contact or auto-inoculation. Incidence rate is between 2% and 8% and found to be 0.32% by Doğan et al. (19,26). In our study, it was found at a rate of 4.5 % on the lips.

Impetigo is the most frequently seen infection in oral mucosa and skin in children. The causative organisms are staphylococci and streptococci. It is mostly seen on the face, nostrils and lips. Spreading through auto-inoculation is commonly seen (29). It is reported at rates between 3% and 4.1% in the literature (17,20). In our study, we detected impetigo at a rate of 3.6%.

Benign migratory glossitis, also known as geographical tongue, is characterized by map-like atrophy of the filiform papillae. In the literature, it was reported at rates between 0.28% and 23 % (3,5,10,14,15,20,25,30). The rates in our country are between 0.01% and 1.7% (6,7,17). We observed glossitis in only 2 of our cases (1.8%). The fact that this disease, which is commonly seen in children was seen at a low rate in our study may be caused by little attention paid by families.

Lichen Planus is an itchy dermatosis by activated lymphocytes, which involves the skin and mucosa. Of all reported cases, 1% to 4% are children (10,11). Mucosal involvement is rarely seen in children under 16 years of age (10,11) Onset age may be between 8 months to 12 years. Nanda reported the rate of lichen planus in children as 0.09% (20). Lichen planus may also be seen in Graft Versus Host developed following bone marrow transplantation (31). In our study, there were only two cases (0.06% among oral mucosal diseases overall, and 1.8% among oral mucosal diseases). One of these had aplastic anemia history and development of GVH due to bone marrow transplantation.

Candidiasis is a disease caused by candida spp. It is seen in 2 % to 5% of healthy infants. It is found at high rates in the normal

oral flora. The disease develops due to physical irritation or local systemic predisposition (32). Its prevalence varies between 0.01% and 37% (14,25,30). In our country, it was reported in children under 2 years of age at rates of 10% and 7.7% by to be Yılmaz et al. (33) and Kose et al.(7), respectively. In our study, there were only 2 cases. The cause of the fact that this disease, which is commonly seen in children was seen at a low rate in our study may be that the disease is resolved by the families, primary care physicians and pediatricists.

Traumatic ulcer may be caused by biting, rough food, heat or an external object. Its rates were reported to be 3.19% by Ambika et al. (5), 17.8% by Majorana et al.(25), between 0.09% and 22% by Riboo Crespo et al.(14), while 0.03% by Mumcu et al (6). in our country. In our study, only one case had ulcer (0.03%).

Melanocytic nevi are mostly located in buccal gingiva, lips, vermilion border and soft palate. The incidence rate of intraoral nevi is 1/10 000. The most commonly seen type is the intramucosal type. (23,34). In our study there was one case having melanocytic nevus located in lips.

Mucocele occurs when the minor salivary gland or duct is blocked or injured. In the literature, it was reported to be at rates of 0.08%- 1.1% (4,5,12). In our country, its rates were found to be 0.01% by Tamer et al, (17) and 1.54% by Kose et al. ( 7). In our study, there was only one case.

Oral mucosa findings may be present in the course of systemic diseases, and also drugs used for such diseases may cause oral mucosa disorder. In our study, systemic diseases such as anemia, chronic infections, glycogen storage disease, asthma, epilepsy were detected in 29 cases (26.7%). In addition, they had drug use history for these diseases. Angioedema and lichen planus due to drugs were observed.

## CONCLUSION

The types, distributions and frequencies of oral mucosal disorders seen during childhood are different compared to adults and by population. The fact that most of the oral mucosal diseases, of which more than 200 types are reported in the literature, were not seen in our study may be caused by the fact that our study was not conducted for screening purposes and by the specific approach used.

Routine mouth examination should be done in children even if they don't have complaints. If left untreated, some oral mucosal disorders may affect the food intake of the children thereby affecting their growth and development and impairing their quality of life. Similarity of our results to the other studies conducted in our country may be attributed to the common genetic and environmental features. The results of our study which are different from the literature may be explained by the difference in the distribution of age of the study groups, SEL,

gender, geographic regions and by the fact that this study was not conducted for screening purposes. The limitation of our study may be that we couldn't access the parameters for every patient since it was a retrospective study. Since our study was conducted in a reference hospital, we believe that it may lead the way for the future studies and help with respect to preventive medicine by allowing identification of viral diseases, isolation of patients and prevention of transmission.

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