# The Rate of Oral Lesions in Infants and Neonates Attend Maternity and Pediatric Teaching Hospital in Sulaymaniyah City

**Shaida Muhammed Ali Hassan** (BDS, KBMS)[1] **and Balkess Taha Garib**(BDS,MSc, PhD)[2]

[1]Oral and Maxillofacial Medicine, Sulaymaniyah, Iraq
[2]College of Dentistry, University of Sulaymaniyah, Sulaymaniyah, Iraq

Correspondence Address:
Shaida Muhammed Ali Hassan
Oral and Maxillofacial Medicine, Sulaymaniyah, Iraq
email: shaida.ali06@gmail.com

Received: 2 February 2021
Revised: 18 February 2020
Accepted: 4 April 2021
Published: 25 October 2021
Diyala Medical Journal 2021:21(1): 20-27

## Abstract

**Background:** The prevalence of oral mucosal lesions in infants and neonates is still a matter of debate.
**Objective:** To find the frequency of oral mucosal lesions in children from Sulaymaniyah city.
**Patients and Methods:** A cross-sectional study was performed in Maternity and Pediatrics Teaching Hospitals in Sulaymaniyah city. Twohundred children aged from birth to two years old were randomly selected. Demographic features, mode of delivery, pattern of feeding, and type and site of oral mucosal lesions, were recorded.
**Results:** Male: female ratio was 1.06:1, and 64% were delivered by cesarean section. Significant differences were present between breastfeeding with the mode of delivery and age of the infants. Oral mucosal lesions were observed in 64.5% of children at 141 sites. 30% of lesions are located at median palatine raphe. The diagnosis of 30% of oral mucosal lesions was Epstein pearls, and 16% were Bohn's nodule. The oral mucosal lesions were more frequently seen in children within the first week.
**Conclusion:** About three-quarters of children was afflicted with oral mucosal lesions. Besides, Epstein pearls and Bohn's nodule were among the most frequent diagnosis. Further, ages of a week or less afflicted more with congenital oral mucosal lesions.
**Keywords:** Oral mucosal lesion, Oral developmental cyst, Infant, Neonates, Sulaymaniyah

## Introduction

The oral cavity is a gateway into the digestive system, and the mucous membrane of the oral cavity is considered a mirror for general health [1]. Besides, oral mucosal lesions (OMLs) were not adequately studied in children, and they associate with their growth and development; therefore, it is an important issue that needs to be considered well.

The OMLs in pediatric age groups is a rare topic. They are of interest to pediatricians, dentists, and dermatologists [2]. Until now, the incidence and classifications of OMLs for children aged less than two years old are not well established. This fact is because most of the authors studied these lesions in children having more than two years, and only a few researchers examined a group of children aged from birth up to five years old (2-3). Besides, the considerable sociodemographic heterogeneity, geographical extensions, and differences in the epidemiology of OMLs are other reasons for not well establishing its classification [3]. Therefore, the prevalence and incidence of OMLs are still a matter of debate in infants and neonates. It has been reported to range from 2.3-24.9% in children aged from birth to five years (2-3). While in the study of Espinosa-Zapata *et al.* [4] in Mexico, which enrolled children aged from one year to 16 years old, the OMLs incidence was 7.4%, and the study of Abdulla *et al*. [5]in Iraq which enrolled children aged from birth to 15 years old, its incidence was 12%.

The OMLs can be caused by; local microorganisms, systemic diseases, drug reactions, developmental lesions (e.g., cysts), and lifestyle factors such as nutritional status and feeding [3, 6]. The clinical features of OMLs can be asymptomatic or associated with pain and discomfort [3]. They may interfere with chewing, sucking, and swallowing and may produce halitosis [3]. Moreover, the treatment of OMLs depends on the cause(s); therefore, knowledge about the type and distribution of lesions in the oral cavity is mandatory for successful treatment [1].

The current study aimed to determine the frequency of oral lesions in neonates and children in Sulaymaniyah city. It also aimed to identify their association with the route of delivery, the age, gender, and feeding process of those children.

## Patients and Methods

A cross-sectional study was conducted for five months from October 2019 through February 2020. The study was held at the Maternity and Pediatrics Teaching Hospitals in Sulaymaniyah city. Two hundred randomly selected neonates and children (aged from birth to two years old) were included after obtaining their parents' acceptance and signing a consent form. The Research Ethical Committee of the Kurdistan Board of Medical Specialties (KBMS) approved the study proposal, and a formal acceptance letter was obtained from the hospitals before starting the study.

The age, gender, bodyweight of the baby, and parental consanguinity and residency were recorded. Besides, the history of the mode of delivery and the manner of baby feeding were also recorded. For intraoral examination, all the children and neonates were examined by the oral medicine specialist under standardized conditions

using artificial lights, disposable tongue depressors, disposable gloves, and gauze pads to scrape thrush if present. Any mucosal change was registered concerning its location and diagnosis.

Frequency and percentage were measured for non-parametric variables. The age was presented as mean ± standard deviation (SD). Mann-Whitney U test was used to ascertain the significance of differences between the groups.

## Statistical analysis

Data analyzed using IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp. Statistical significant results were considered at a p-value of less than 0.05.

## Results

The sample showed slight variation of gender (male: female ratio was 1.06:1) and family residence (inside or outside Sulamaniyah city) distributions. The majority of the children were delivered by cesarean section (64%). The mean age and weight of the children at the time of examination were 3.5 ± 6.17 months and 4.9 ± 2.81 grams, respectively Table (1).

**Table (1):** Demographic characteristics of the studied sample

| **Parameter** | | **No.** | **%** |
|---|---|---|---|
| Gender (M:F ratio = 1.06:1) | Male | 103 | 51.5 |
| | Female | 97 | 48.5 |
| Address | Inside city | 117 | 58.5 |
| | Outside city | 82 | 41.5 |
| Delivery | C/S | 128 | 64 |
| | NVD | 72 | 36 |
| Consanguineous parents | no | 136 | 68 |
| | yes | 64 | 32 |
| Age | **Mean ± SD** | **No.** | **(%)** |
| ≤ week | .074 ± 0.25 | 130 | 65 |
| > week | 9.86 ± 6.8 | 70 | 35 |
| Total | 3.5 ± 6.17 | 200 | 100 |
| Weight (Kg) | 4.9 ± 2.81 | 200 | 100 |

* M:F = Male:Female; C/S = cesarean section; No. = number; NVD = normal vaginal delivery, SD = standard deviation

Clinical oral and extraoral findings were observed in 129 (64.5%) children at 141 sites. The majority of the children (30%) showed alteration at the median palatine raphe, followed by the junction between hard and soft palate (14%) Table (2). The majority of the children had Epstein pearls (30%), followed by Bohn's nodule (16%) Table (3). Twelve children had more than one clinical finding at different sites Table (4).

**Table (2):** Frequency distribution of oral clinical findings and involved sites among the children

| **Oral clinical findings** | **Per child** | | **Per site** | |
|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** |
| Mid palatine raphe | 60 | 30 | 66 | 46.8 |
| Hard and soft palate's junction | 28 | 14 | 34 | 24.1 |

| | | | | |
|---|---|---|---|---|
| Dorsum of tongue | 7 | 3.5 | 12 | 8.5 |
| Ridge anterior | 7 | 3.5 | 12 | 8.5 |
| Syndrome | 3 | 1.5 | 3 | 2.1 |
| Anterior palate | 2 | 1 | 2 | 1.4 |
| Jaundice | 2 | 1 | 2 | 1.4 |
| Soft palate and oropharynx | 2 | 1 | 2 | 1.4 |
| Ridge posterior | 1 | 0.5 | 2 | 1.4 |
| Teeth | 1 | 0.5 | 2 | 1.4 |
| Floor of mouth | 1 | 0.5 | 1 | 0.7 |
| Mucosa of lips | 1 | 0.5 | 1 | 0.7 |
| Tip of nose | 1 | 0.5 | 1 | 0.7 |
| Tonsillar area | 1 | 0.5 | 1 | 0.7 |
| Two involved sites* | 12 | 6 | 0 | 0 |
| Total | 129 | 64.5 | 141 | 100 |
| Healthy children = 71 (35.5%) | | | | |

* Details of these sites are presented in Table 4; No. = number

**Table (3):** Frequency distribution of observed clinical features among the children

| **Observed clinical features** | **per child** | | **per site** | |
|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** |
| Epstein pearls | 60 | 30 | 65 | 46.1 |
| Bohn's nodule | 32 | 16 | 41 | 29.1 |
| Candidiasis | 7 | 3.5 | 12 | 8.5 |
| Erythematous | 6 | 3 | 7 | 5 |
| Gingival cyst of new born | 3 | 1.5 | 6 | 4.3 |
| Caries | 1 | 0.5 | 2 | 1.4 |
| Discoloration | 2 | 1 | 2 | 1.4 |
| HSV | 2 | 1 | 2 | 1.4 |
| Cleft lip and palate | 1 | 0.5 | 1 | 0.7 |
| Hemangioma | 1 | 0.5 | 1 | 0.7 |
| Large tongue / Down's syndrome | 1 | 0.5 | 1 | 0.7 |
| Treacher Collins Syndrome | 1 | 0.5 | 1 | 0.7 |
| Two clinical findings* | 12 | 6 | 0 | 0 |
| Total | 129 | 64.5 | 141 | 100 |
| Healthy children = 71 (35.5%) | | | | |

* Details of these sites are presented in Table 4; HSV = Herpes simplex virus; No. = number

**Table (4):** Combined clinical findings in more than one involved site

| Combined clinical findings | Localization in children with two involved sites | No. |
|---|---|---|
| Epstein pearls + candidiasis | Mid palatine raphe posterior and middle + tongue | 1 |
| Erythematous + candidiasis | Lips mucosa + tongue | 1 |
| Candidiasis + caries | Dorsum of tongue + ABCD \| ABD | 1 |
| Bohn s nodule + candidiasis | Hard and soft palate's junction + tongue | 2 |
| Gingival cyst of newborn + Bohn's nodule | Ridge anterior lower right + Hard and soft palate's junction | 1 |
| | Upper ridge anterior + Hard and soft palate's junction | 2 |
| Epstein pearls + Bohn's nodule | Mid palatine raphe posterior and anterior + both posterior ridge of palate | 1 |
| | Mid palatine raphe posterior + upper ridge anterior | 2 |
| | Mid palatine raphe posterior + Hard and soft palate's junction | 1 |
| Total | | 12 |

* No. = number

The site of the observed oral lesions depended on the age of the children Table (5) ($p < 0.001$). These clinical findings were more frequently seen in infants within the first week (78.3%). They are predominately located in the median palatine raphe, the junction between hard and soft palate, and the upper alveolar ridge. Besides, nine children presented with two lesions simultaneously. On the other hand, older children had alterations at the dorsum of the tongue Table (5). Concerning the age of the 71 healthy children, 26 (36.6%) were infants within the first week, and 45 (63.4%) were above one week of their ages.

**Table (5):** Age of children and type of clinical findings with the sites of the lesion

| Age | Mid palatine raphe | Anterior palate | Hard and soft palate's junction | Soft palate & oropharynx | Ridge upper | Lips mucosa | Dorsum of tongue | Floor of mouth | Tonsillar area | Tip of nose | Caries | Jaundice | Two lesions | Syndrome | Total | p-value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ≤ week | 57 | 0 | 26 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 9 | 1 | 101 (78.3%) | <0.001 |
| > week | 5 | 2 | 2 | 2 | 2 | 1 | 7 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 28 (21.7%) | |

## Discussion

Ensuring children's healthy development should be a significant concern for all societies because they represent the future [7]. Further, neonates and infants are vulnerable to many preventable and treatable diseases such as malnutrition and infections [7]. Besides, any oral cavity disease can affect proper feeding, children's growth, and development [1-4].

The OMLs in children, especially for children aged two years or less, are not well established, and it is a rare topic of interest

by many researchers [5,8-10]. Published articles showed heterogeneity in the incidence of the OMLs in children because the age ranges were dispersed in different studies [6, 10]. Our study focused on children aged two years or less, and their mean age was 3.5 ± 6.17 months. Therefore, this may explain why our patient's demographic features were not the same as other studies' demographic features [2-3, 6, 10-11].

The gender in the current study was almost had equal distribution; the male: female ratio was 1.06:1, which was about the same result as the study of Majorana *et al*. [11] who selected children from birth to 12 years. Also, the study of Babu *et al.* [10] showed female predilection. The demographic features, including ages, were not the same in previous literature [6,10]; Majorana *et al.* [11] selected children from birth to 12 years, while Babu *et al.* [10] enrolled ages from 1-92 years. Further, 117 (58.5%) children have resided inside the center of Sulaymaniyah city, and this may have affected the parental decision to choose the most accessible mode of delivery for their babies; the majority (64%) of them delivered by caeserian section (C/S). Besides, none consanguinity between the majority of the children's parents in the current study may decrease the possibility of congenital OMLs.

We selected the children from two major public hospitals in Sulaymaniyah city, Maternity and Pediatrics Teaching Hospitals. Although nearly one-third (35.5%) of the sampled children were healthy, hospitalized children are more likely to have OMLs. Also, there is no agreement on unified classification and prevalence for OMLs [11] due to the sample's sociodemographic features, heterogeneity of analysis, and diagnostic criteria differences. Therefore, our sample could represent the entire hospitalized children but not the entire children in our population. Although the ages of the children in the study of Yilmaz *et al*. [8] done in Turkey were the same as the ages of our children, i.e., two years or less, they had fewer healthy children (21.27%) as compared to our result. Further, this difference may be because we selected hospitalized children from pediatric and obstetrical hospitals; however, Yilmaz *et al*. [8] enrolled only children from the outpatient clinic of a pediatric hospital.

This study showed that 64.5% of children had clinical findings, predominated at the median palatine raphe followed by the hard and soft palate's junction. Epstein pearls (30%) and Bohn's nodule (16%) were the main clinical findings. Also, twelve children had more than one clinical finding at more than one site. In the current study, most OMLs were congenital (i.e., Epstein pearls and Bohn's nodule). On the contrary, studies performed in Iran [12], Turkey [13], Taiwan [14], Brazil [15], and the United States [16] showed OMLs of inflammatory and reactive types more frequently. However, a study performed in Thailand, partly in agreement with our results, reported cystic lesions, including congenital cysts, more frequently [17]. These differences may be due to age ranges that those studies took compared to the less than two years of age of the children in our study.

Therefore, our results showed a statistically significant difference between the location of the OMLs as compared to ages; infants aged a week or less were more afflicted with

OMLs. This result may be because the parent focuses early on the congenital lesions of their baby, and the immunity of the infants is not well developed for the acquired lesions.

## Conclusions

In conclusion, the majority of children aged less than two years had lesions at the median palatine raphe, followed by the hard and soft palate's junction. Furthermore, the majority of the types of lesions were Epstein pearls, followed by Bohn's nodule. There was a significant difference between the location of the OMLs as compared to ages, and infants of less than a week were more afflicted with OMLs.

## Recommendations

We recommend performing new studies on the same topic by either screening all the newly delivered babies, i.e., a very large sample size, or choosing cohort studies, and follow-up children for a longer period to find out the associated risk factors.

**Source of funding:** The authors did not receive any funding from any source.

**Ethical clearance:** The authors had nothing to declare

**Conflict of interest:** Nill.

## References

[1]Goyal R, Jadia S, Jain L, Agarawal C. A clinical study of oral mucosal lesions in patients visiting a tertiary care center in central India. Indian J Otolaryngol Head Neck Surg. 2016;68(4):413–6. DOI: 10.1007/s12070-015-0868-x

[2]Muthu J, Muthanandam S, Mahendra J. Mouth the mirror of lungs: where does the connection lie?. Front Med. 2016;10(4):405–409.DOI:10.1007/s11684-016-0476-5

[3]Islam NM, Bhattacharyya I, Cohen DM. Common oral manifestations of systemic disease. Otolaryngol Clin North Am. 2011;44(1):161–vi.
DOI:10.1016/j.otc.2010.09.006

[4]Jahanbani J, Sandvik L, Lyberg T, Ahlfors E. Evaluation of oral mucosal lesions in 598 referred to Iranian patients. Open Dent J.2009;3:42–47.
DOI:10.2174/1874210600903010042

[5]Abdulla BH, Abdul Qader OMJ, Mussedi OS. Retrospective analysis of 1286 oral and maxillofacial biopsied lesions of Iraqi children over a 30 years period. Pediatr Dent J.2016;26(1):16-20.
DOI: 10.1016/j.pdj.2015.10.003

[6]Colaci R, Sfasciotti G. Most common oral mucosal lesions in children: Prevalence and differential diagnosis. WebmedCentral DENTISTRY. 2013;4(12):WMC004483.

[7]Silva LVO, Arruda JAA, Martelli SJ, Kato CNAO, Nunes LFM, Vasconcelos ACU, *et al.* A multicenter study of biopsied oral and maxillofacial lesions in a Brazilian pediatric population. Braz Oral Res. 2018;32:e20.
DOI:10.1590/1807-3107bor2018.vol32.0020.

[8]Yilmaz AE, Gorpelioglu C, Sarifakioglu E, Dogan DG, Bilici M, Celik N. Prevalence of oral mucosal lesions from birth to two years. Niger J Clin Pract. 2011;14(3):349–353. DOI: 10.4103/1119-3077.86782

[9]Ataíde AP, Fonseca FP, Santos Silva AR, Jorge Júnior J, Lopes MA, Vargas PA. Distribution of oral and maxillofacial lesions in pediatric patients from a Brazilian southeastern population. Int J Pediatr Otorhinolaryngol. 2016;90:241–244. DOI: 10.1016/j.ijporl.2016.09.027.

[10]Babu RA, Chandrashekar P, Kumar KK, Reddy GS, Chandra KL, Rao V, *et al*. A

study on oral mucosal lesions in 3500 patients with dermatological diseases in South India. Ann Med Health Sci Res. 2014;4(Suppl 2): S84-93.
DOI: 10.4103/2141-9248.138019

[11]Majorana A, Bardellini E, Flocchini P, Amadori F, Conti G, Campus G. Oral mucosal lesions in children from 0 to 12 years old: ten years' experience. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2010;110(1):e13-8. DOI: 10.1016/j.tripleo.2010.02.025.

[12]Siadati S, Seyedmajidi M, Sharbatdaran M. Frequency of different oral lesions in children and adolescents in Babol, Northern Iran. Caspian J Intern Med. 2013;4(4):773-6. PMID: 24294472.

[13]Wan YL, Chang HH, Chang JY, Huang GF, Guo MK. A Retrospective survey of biopsied oral lesions in pediatric patients. J Formos Med Assoc. 2009;108:862-71.
DOI:10.1016/S0929-6646(09)60418-6.

[14]Dhanuthai K, Banrai M, Limpanaputtajak S. A retrospective study of pediatric oral lesions from Thailand. Int J Paediatr Dent. 2007;17(4):248-53.
DOI: 10.1111/j.1365-263X.2007.00828.x.

[15]Sousa FB, Etges A, Correa L, Mesquita RA, de Araujo NS. Pediatric oral lesions: a 15-year review from sao Paulo, Brazil. J Clin Pediatr Dent. 2002;26:413-8.
DOI: 10.17796/jcpd.26.4.47n1670jr961x566.

[16]Jones AV, Franklin CD. An analysis of oral and maxillofacial pathology found in children over a 30-year period. Int J Paediatr Dent. 2006;16(1):19-30.
DOI: 10.1111/j.1365-263X.2006.00683.x.

[17]Shamim T, Varghese VI, Shameena PM, Sudha S. A retrospective analysis of gingival biopsied lesions in south Indian population: 2001-2006. Med Oral Patol Oral Cir Buccal 2008;13(7): E 414-8. PMID: 18587304.