Print ISSN: 2321-6379
Online ISSN: 2321-595X
DOI: 10.17354/ijss/2016/579

Original Article

Oral and Maxillofacial Biopsy Reports of Children in South Kerala Population: A 20-year Retrospective Study

R Heera[1], Revathy Bharathan[2], S K Padmakumar[3], R Rajeev[4], R Sivakumar[3]

[1]Professor, Department of Oral Pathology and Microbiology, Government Dental College, Thiruvananthapuram, Kerala, India, [2]Post-graduate Student, Department of Oral Pathology and Microbiology, Government Dental College, Thiruvananthapuram, Kerala, India, [3]Assistant Professor, Department of Oral Pathology and Microbiology, Government Dental College, Thiruvananthapuram, Kerala, India, [4]Associate Professor, Department of Oral Pathology and Microbiology, Government Dental College, Thiruvananthapuram, Kerala, India

Abstract

Aim: To determine the frequency of distribution of various oral lesions biopsied in children 12 years and below in a tertiary health-care center in south Kerala.

Materials and Methods: The archives of department of oral pathology and microbiology were retrospectively analyzed. Biopsy records of all oral lesions from pediatric patients, aged 0-12 years, in the files of the Department of oral Pathology and Microbiology, Government Dental College, Thiruvananthapuram, from 1995 to 2015**.** Descriptive statistical analysis was performed using the computer software, Statistical Package for Social Sciences (SPSS) IBM SPSS Software version 16.

Results: Fifteen thousand five hundred and forty-one biopsy specimens were received, of which 540 (3.47%) were from the pediatric population. Prevalence was observed between females (52.4%) and males (47.6%). Mandible was the most commonly affected site for intraosseous lesions, followed by lower lip or soft tissue lesions. The most common conditions diagnosed individually were mucocele (17.4%), dentigerous cyst (12%), and radicular cyst (11.5%). Regarding the diagnostic categories, the largest number of cases was from inflammatory followed by cystic and odontogenic tumor category.

Conclusions: This study showed similar as well as contradictory results compared to other studies, probably due to geographical and ethnic variations which are yet to be corroborated.

Key words: Dentigerous cyst, Mucocele, Odontogenic tumor, Radicular cyst

INTRODUCTION

Children are a distinct part of the general population, having different types of diseases**.** Despite the vast literature reporting the prevalence of oral and maxillofacial diseases in the last decades, few studies have focused on biopsied lesions in the pediatric population. When comparing the occurrence of lesions in the pediatric population, variations in relation to the age, prevalence, and geographic distribution have been found.

Access this article online

www.ijss-sn.com

Month of Submission : 09-2016
Month of Peer Review : 10-2016
Month of Acceptance : 10-2016
Month of Publishing : 11-2016

Reviews on oral lesions in children are very few to quote. Some reviews reported are by Lima Gda *et al.*,[1] Skinner *et al.*,[2] Dhanuthai *et al.*,[3] and Saxena *et al.*[4] The review reported by Saxena *et al.* from Meerut, India is on pediatric tumors seen in jaws.[4] Literature reveals very few studies involving all pediatric pathologies from India and none from Kerala. This study will throw some light regarding the prevalence and characteristics of the lesions prevailing in the pediatric population in this geographic area, which in turn will be useful for the general dentist and pediatric dentist in diagnosing and managing these lesions appropriately.

MATERIAL AND METHODS

Sample Selection and Collection of Clinical Data

After the Institutional Ethics Committee clearance, archives of biopsy request of pediatric patients were retrieved from

Corresponding Author: Revathy Bharathan, Oral Pathology and Microbiology, Kerala University of Health Sciences, Government Dental College, Thiruvananthapuram, Kerala, India. Phone: +91-7736469098. E-mail: revathi.bharathan@gmail.com

the Department of Oral Pathology and Microbiology, Government Dental College, Thiruvananthapuram, during the time period from January 1995 to December 2015. For the oral and maxillofacial lesions detected, data regarding to age, gender, location, and histopathological diagnosis were evaluated. Biopsies were grouped under 6 categories. Recurrent lesions were counted as a single case to avoid reduplication. Children were categorized into 3 age groups, i.e., 0-6, 7-9, and 9-12, respectively.

Hyperplastic/reactionary lesions

Pyogenic granuloma, inflammatory fibrous hyperplasia, mucocele, pulp polyp, granulation tissue, and gingival hyperplasia.

Cystic lesions

Periapical cyst, odontogenic keratocyst, residual cyst, dentigerous cyst, eruption cyst, lateral periodontal cyst, and soft tissue cyst.

Odontogenic tumors

Odontoma, ameloblastoma, adenomatoid odontogenic tumor, calcifying epithelial odontogenic tumor, odontogenic myxoma, odontogenic fibroma, and malignant tumors.

Soft tissue neoplasms

Fibroma, neurofibroma, hemangioma, squamous papilloma, lipoma, lymphangioma, and salivary gland neoplasms.

Bone pathologies

Central giant cell central granuloma, peripheral giant cell granuloma aneurysmal bone cyst, traumatic bone cyst, fibrous dysplasia, central ossifying fibroma, peripheral ossifying fibroma, osteoma, cherubism, and osteosarcoma.

Others

Pericoronal follicle, natal tooth, supernumerary teeth, autoimmune diseases, and tooth-related pathologies.

Statistical Analysis

Data were recorded and analyzed by descriptive statistics using the Statistical Package for Social Sciences statistical package.

RESULTS

In the study period of 20-year, 15541 biopsy specimens were received, of which 540 (3.47%) were from pediatric population. Figure 1 shows the patient distribution for age groups. Prevalence was observed between females (52.4%) and males (47.6%). Mandible was the most commonly affected site for intraosseous lesions, followed by lower lip or soft tissue lesions (Figure 2). The most common conditions diagnosed individually were mucocele (17.4%),

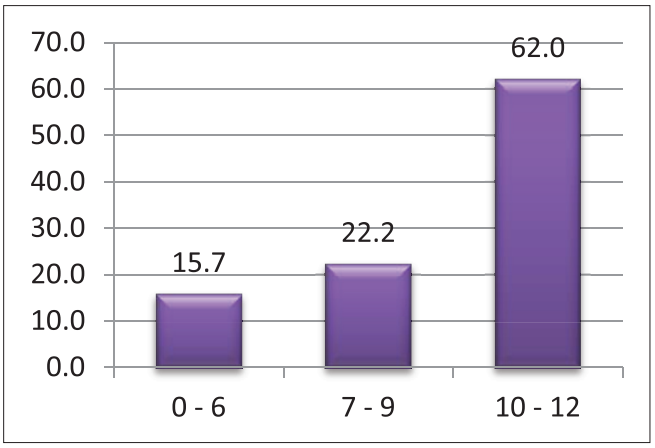

Figure 1: Percentage distribution of the sample according to age

dentigerous cyst (12%), and periapical cyst (11.5%). Regarding the diagnostic categories, the largest number of cases were from inflammatory followed by cystic and odontogenic category.

Mucocele was also the most common condition in the reactionary lesion category. Dentigerous cyst was the most common condition in the cystic lesion group, followed by periapical cyst. Odontoma was the most common in odontogenic tumor category. Fibroma was the most prevalent lesion in the benign neoplasm group, followed by squamous papilloma, followed by hemangioma. Odontoma accounted for 51.3% of the odontogenic tumors. Malignant lesions comprised only 0.5% of the total sample size.

DISCUSSION

Previous[5-7] studies on oral and maxillofacial lesions in pediatric patients showed that the number of pediatric biopsies accounts for <10% of all cases referred to histopathology services. Similar prevalence was observed, in the present study as well, since 4.4% of the total number of biopsies was conducted in children aged 0-12 years. One of the most important variables in any study concerning pediatric patients is age. The oral cavity undergoes extensive significant changes in children during development as they age. It is difficult to determine the age interval, in which pediatric oral and maxillofacial lesions occur most frequently because of the different age ranges used in different studies. For instance, some studies recruited children up to 15 years of age, whereas others accepted older children as well as into their studies. To compare and contrast the data, in the present study, pediatric population of children 12 years and below was subdivided into 3 age groups, and majority of the lesions occurred in children in 10-12 age groups. The number of cases reported was higher in the age group of 10-12 years compared to the other two

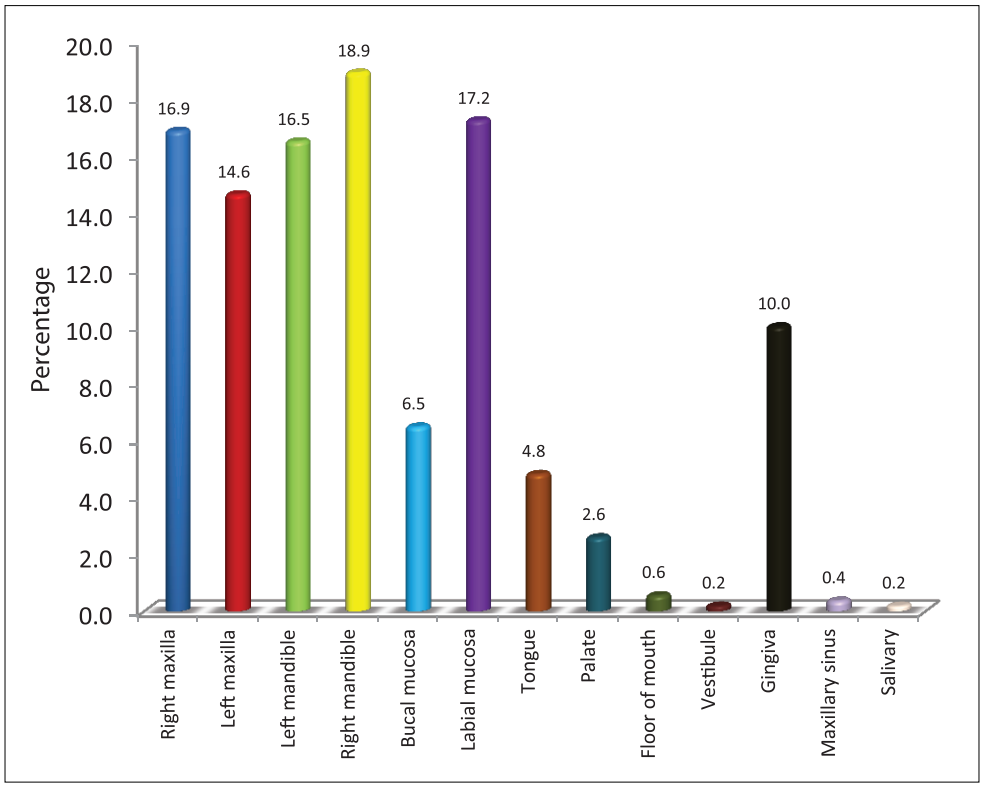

Figure 2: Percentage distribution of the sample according to site

groups. Many studies showed an almost equal distribution between both genders as reported by Das and Das[8] and Jones and Franklin.[9] However, in this study, the pathologies were more common in females. Studies of Maia *et al.*[10] and Lima Gda *et al.*[1] reported maxilla as the most common site, but in the present study, mandible was found to be more affected than maxilla. Both gender and site predilection was similar to a study done by Krishnan *et al.*[11] in a neighboring state in South India suggesting an ethnic and geographical predilection for the disease distribution.

Inflammatory and Reactive Lesions

The major category represented in the present study was inflammatory and reactive lesions. The largest group within this category as well as the most common lesion in this study was the mucocele similar to the studies reported by Skinner *et al.*[2] and Das and Das *et al.*[8] Mucocele formation is still unclear although it is known to be flavored by a traumatic etiology. Psychological stress is thought to be an initiating factor for the biting trauma in children. In our study also lower lip was the most common site with female predilection. The lower lip, a trauma-prone site also supports the role of trauma as an etiologic factor either in the form of sharp tooth cusp or biting habit in children. The greater number and density of salivary glands in the lower lip combined with downward forces of gravity, may also play a role in the predilection for mucocele development in the lower lip.[12] The second most common inflammatory or reactive lesion in our study was pyogenic granuloma. This incidence is comparable to that reported by Krishnan *et al.*[11] in South India. The unmastered toothbrushing techniques in children may be considered as a significant cause of microtrauma and inflammation to the gingiva. Trauma to deciduous teeth, aberrant tooth development, and occlusal interferences may also be other precipitating factor in children. According to Mo Mouchrek *et al.*,[13] inflammatory fibrous hyperplasia was the commonest lesion. According to Gulteklin *et al.*,[5] peripheral giant cell granuloma was the most common lesion.

Cystic Lesions

In the present study, we found the incidence of pediatric jaw cysts to be predominated by cysts of developmental origin (dentigerous cyst 41.1%) compared to that of inflammatory origin (periapical cyst 39.5%). This was in confirmation with findings of Dhanuthai *et al.*[3] Similarly, Bodner *et al.* in 2012 also showed that 45% of cystic lesions seen in children were dentigerous cyst while radicular cyst represented only 13.3% of such lesions. Our findings, however, were not in accordance with the distribution of cysts in the general population in Southern India as reported by Donoghue *et al.*[14] which showed a predominance of inflammatory cysts. As suggested in previous literature, this difference in the distribution of developmental and inflammatory cysts in children may probably be attributed to the state of

dynamism of dentoalveolar complex. There is interplay of several factors including the development and eruption of the succedaneous dentition and the simultaneous skeletal growth of the maxilla and mandible in this age. In addition, we also suggest that the incidence of inflammatory jaw cysts in the pediatric population is probably underreported owing to the fact that exfoliation/loss of primary teeth may result in the resolution of certain cystic lesions that are limited in size and are asymptomatic, particularly when they do not involve the underlying tooth follicles of permanent teeth. The increased number of developmental cysts also suggests a probable role of genetic factors in its formation whereas inflammatory cysts have obviously more of an environmental etiology.[14] Odontogenic keratocysts (10.8%) were the third most common odontogenic cysts seen. According to literature, occurrence of OKCs was reportedly around the second or third decade, or age approaching adulthood. Only lesser number of cases are diagnosed in the first decade of life. This may be because of the intramedullary growth of the cyst without obvious facial asymmetry.[4] Since our study group was children below 12 years, may be considered as one reason for the lesser number of cases recorded. Other cysts such as lateral periodontal cyst and fissural cyst were also seen. Right mandible was the most common site of involvement of these cysts with a male predilection.

Odontogenic Tumors

Among the odontogenic tumors in our study, odontoma was the most common tumor. Odontoma accounted for 51.3% of the odontogenic tumors. Since odontomas are mostly asymptomatic and most lesions are found only in routine radiographic examination, increased awareness of people in this region about pediatric oral health and increased number of referral cases may be a reason for increased number of reported cases compared to other cases in this category. Although the etiology of odontoma is unclear, infections or local traumas may be a cause. Most lesions were found left anterior maxilla with a male predilection. Odontoma was the most common odontogenic tumor as reported by Dhanuthai *et al.*[3] Saxena *et al.*,[4] and Arotiba.[15] The second and third being ameloblastoma and calcifying epithelial odontogenic tumor. The study done by Krishnan *et al.*[11] from Tamil Nadu shows ameloblastoma as the most common lesion. Three cases of odontogenic myxoma, two case of odontogenic fibroma, and one case of ameloblastic fibro-odontoma was also noted in the present study.

Soft Tissue Neoplasms

Fibroma was the most prevalent diagnosed condition, followed by squamous papilloma and hemangioma. It is important to know the fact that hemangioma may not always be biopsied. Therefore, hemangioma occurrence might be even higher than the number of cases reported herein. Of the three salivary gland tumors reported two were mucoepidermoid carcinomas and one pleomorphic adenoma.

Malignant lesions seen were only one case of osteosarcoma and two cases of mucoepidermoid carcinoma. Similar results have been reported by Jones and Franklin,[6] who detected malignancy in 1% of the all analyzed biopsies. In addition, the most commonly affected sites were the buccal mucosa, mandible, lower lip, and gingival, and a male predilection was observed. Maaita *et al.*[10] mentioned mandible and lip as the most prevalent sites, while Das and Das[8] found a higher prevalence in the periodontium and lip.

Bone Pathologies

Among the fibro-osseous lesions, fibrous dysplasia was the most common. Since craniofacial fibrous dysplasia is commonly seen in the second and third decades of life and the present study included only children 12 years and below may be one reason for lesser number of fibrous dysplasia cases reported in this study. Saxena *et al.*[4] studied pediatric jaw tumors and have reported 9 cases of fibrous dysplasia. Central ossifying fibroma, osteoma, peripheral giant cell granuloma, and central giant cell granuloma stand next showing a female predilection with right posterior mandibular region commonly involved.

Others

Few of pediatric biopsies were also formed by the pericoronal follicle also. Four cases of autoimmune diseases were also reported in children, of which three were pemphigus and one was lichen planus.

CONCLUSION

It is important to note that the overall and relative frequency of individual pediatric oral lesions differ from region to region. The difference in reported frequency could be due to geographic or ethnic differences although it remains to be proved. Therefore, studies from India could contribute additional knowledge to the literature and serve as a potential source of information to understand the role of regional or geographic variations. Because the populations in India are ethnically diverse and defined by their linguistics and caste linkages, more studies are required to contribute additional data. The present hospital-based study is designed to provide demographic data on pediatric lesions from the Southern Indian population in the state of Kerala, which is ethnically (Australoid) and linguistically (Dravidian) different from the central, northern, western, and eastern Indian populations, for comparison among pertinent series from other geographic regions. This study will also give general dentists and pediatric dentists of this

area, a solid background for diagnosis and treatment of these entities.

REFERENCES

1. Lima Gda S, Fontes ST, de Araújo LM, Etges A, Tarquinio SB, Gomes AP. A survey of oral and maxillofacial biopsies in children: A single-center retrospective study of 20 years in Pelotas-Brazil. J Appl Oral Sci 2008;16:397-402.
2. Skinner RL, Davenport WD Jr, Weir JC, Carr RF. A survey of biopsied oral lesions in pediatric dental patients. Pediatr Dent 1986;8:163-7.
3. Dhanuthai K, Banrai M, Limpanaputtajak S. A retrospective study of paediatric oral lesions from Thailand. Int J Paediatr Dent 2007;17:248-53.
4. Saxena S, Kumar S, Pundir S. Pediatric jaw tumors: Our experience. J Oral Maxillofac Pathol 2012;16:27-30.
5. Gültelkin SE, Tokman B, Türkseven MR. A review of paediatric oral biopsies in Turkey. Int Dent J 2003;53:26-32.
6. Sato M, Tanaka N, Sato T, Amagasa T. Oral and maxillofacial tumours in children: A review. Br J Oral Maxillofac Surg 1997;35:92-5.
7. Chen YK, Lin LM, Huang HC, Lin CC, Yan YH. A retrospective study of oral and maxillofacial biopsy lesions in a pediatric population from southern Taiwan. Pediatr Dent 1998;20:404-10.
8. Das S, Das AK. A review of pediatric oral biopsies from a surgical pathology service in a dental school. Pediatr Dent 1993;15:208-11.
9. Jones AV, Franklin CD. An analysis of oral and maxillofacial pathology found in children over a 30-year period. Int J Paediatr Dent 2006;16:19-30.
10. Maia DM, Merly F, Castro WH, Gomez RS. A survey of oral biopsies in Brazilian pediatric patients. ASDC J Dent Child 2000;67:128-31, 83.
11. Krishnan R, Ramesh M, Paul G. Retrospective evaluation of pediatric oral biopsies from a dental and maxillofacial surgery centre in Salem, Tamil Nadu, India. J Clin Diagn Res 2014;8:221-3.
12. Jani DR, Chawda J, Sundaragiri SK, Parmar G. Mucocele – A study of 36 cases. Indian J Dent Res 2010;21:337-40.
13. Mouchrek MM, Gonçalves LM, Bezerra-Júnior JR, Maia ED, Silva RA, Cruz MC. Oral and maxillofacial biopsied lesions in Brazilian pediatric patients: A 16-year retrospective study. Journal of dental science. 2011;26:222-6.
14. Padmakumar SK, Beena VT, Aloka D, Lav R, Sivakumar R. Cysts of the jaws in pediatric population: A 12-year institutional study. Oral Maxillofac Pathol J 2015;6:532536.
15. Arotiba GT. A study of orofacial tumors in Nigerian children. J Oral Maxillofac Surg 1996;54:34-8.

How to cite this article: Heera R, Bharathan R, Padmakumar SK, Rajeev R, Sivakumar R. Oral and Maxillofacial Biopsy Reports of Children in South Kerala Population: A 20-year Retrospective Study. Int J Sci Stud 2016;4(8):104-108.

Source of Support: Nil, **Conflict of Interest:** None declared.