Frequency of Paediatric Oral and Maxillofacial Tumors:A retrospective Study

Sidratulmuntaha[1], Nazia Noreen[2], Muslim Khan[3], Muhammad Younas[4], Muhammad Nisar[5], Momena Rashid[6]

1 General Dental Surgeon, Rural Health Centre Pirpiai Nowshera
2 General Dental Surgeon, Nowshera
3 Department of Oral and Maxillofacial Surgery, Khyber College of Dentistry, Peshawar
4 Department of Oral Medicine and Diagnosis, Peshawar Dental College, Peshawar
5 Department of Oral Pathology, Peshawar Dental College, Peshawar
6 Department of Oral Biology, Peshawar Dental College, Peshawar

Abstract

Background and objectives: Tumors in maxillofacial region can be classified in benign or malignant variety, they may also be of odontogenic and non-odontogenic origin. Surgical Intervention in childhood leads to many complications. The aim of this study was to determine the type and frequency of tumors in pediatric population in patients reported to Khyber College of Dentistry Peshawar.

Methods: The admission record of total 80 child patients having maxillofacial tumors were reviewed over a period of 4 years and 5 months i.e., from January 2013 to May 2017 in the department of oral and maxillofacial surgery, Khyber College of Dentistry, Peshawar.

Results: Out of 80 patients, 44 were males and 36 females. Mean age was 12.5±4.6. Most common age of presentation was 18 years. Most common tumor was vascular malformation followed by giant cell granuloma. Majority of the tumors were of benign nature.

Conclusion: Vascular malformation and giant cell granuloma are the most common maxillofacial tumors in children in this region. Timely diagnosis is the key to avoid morbidity and mortality

Key Words: Pediatric maxillofacial tumors, giant cell granulomas, vascular malformations

Introduction:

The maxillofacial region is the site for many neoplatic or malignant, neoplastic or malignant tumors[1]. These tumors have different histological types and clinical features an have function ,cosmetic and psychological affects due to their location.[1,2] Majority of the tumors in maxillofacial region are broadly classified as odontogenic and non odontogenic tumours.[3] Odontogenic cysts in children may be related to the fact that jaws are involved in developmental processes e.g growth of maxillofacial skeleton and development of dentitions. Most of them occur intraosseously.[4] Tumors in children are usually benign and are mesenchymal in origin.[5] Malignant tumors are rare and present after the age of five. Each tumor type has distinct characteristics which are important for treatment and prognosis.[6] Intervention in growing age can lead to complications.

Maxillofacial tumors show geographical variations in prevalence and pattern due to cultural, social, occupational or climatic factors. Previous reports show that the incidence of paediatric maxillofacial tumors was relatively low, (9.1% to10.7%). Majority of them were benign tumors (91% to 97.1%), while malignant tumors constitute 2.9% to 9%.[7] The aim of this study was to determine the type and frequency of maxillofacial tumors in paediatric population reported to Khyber College of Dentistry. This study will help in early clinical diagnosis and patient management. This study will also provide local data for comparison with international studies.

The study will further help in the timely diagnosis of these very important tumor groups. Because their late diagnosis is associated with grave functional and aesthetic consequences.

Corresponding Author:
Sidratulmuntaha
Dental surgeon RHC Pirpiai Nowshera
drsidra09@yahoo.com
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Methodology:

This descriptive retrospective study was conducted in the department of oral and maxillofacial surgery at Khyber College of Dentistry, Peshawar. A total of 80 patients with age 19 years and below were recruited in the study. The admission record of the child patients were reviewed from January 2013 to May 2017. The ages at the time of diagnosis and gender distribution were determined from the hospital admission charts. The objective of the study was to determine the frequency and types of various oral and maxillofacial tumors in children. Recurrent tumors were excluded from the study. The data collected was analyzed using descriptive statistics.

Results:

The admission records of total 80 children were reviewed in which 44 were males and 36 females with male to female ratio of 1.22:1.The age of the patients range from seven months to nineteen years with mean age of 12.5 ± 4.6.The most common age of presentation was 18 years. The type of tumors most commonly reported in children were vascular lesion (23%) followed by giant cell granulomas (17%). Majority of the children reported with benign tumours (91.25%). While malignant tumours were 8.75 % with carcinoma being 6.25% and sarcomas 2.5%.

Table 1: Age and gender distribution of benign oral and maxillofacial tumors in children (n=73)

Age (Years)		<1	1-5	6-11	12-15	16-19	Male	Female
Type of Tumors	Vascular lesion		2	6	3	8	13	6
	Giant cell granuloma		1	6	4	3	8	6
	Fibrous dysplasia		1		3	2	3	3
	Ossifying fibroma			3	1	1	3	2
	Ameloblastoma				1	5	3	3
	Pyogenic granuloma		1	1	1	1	3	1
	Keratocyst				2	3	1	4
	Odontome			1	2	1	3	1
	Osteoma				1	1	2	
	Adenomatoid odontogenic tumor				2		1	1
	Pleomorphic adenoma					1	1	
	Lipoma					1		1
	Neuroectodermal tumor of infancy	1						1
	Odontogenic fibroma							1
	Myofibroma							1
	Gingival Fibroma							1
	Total	1	5	20	20	27	41	32

Table 2: Age and gender distribution of malignant oral and maxillofacialtumors in children (n=7)

Age (Years)		<1	1-5	6-11	12-15	16-19	Male	Female
Type of Tumors	Spindle cell carcinoma		1					1
	Mucoepidermoid carcinoma			1				1
	Squamous cell carcinoma				2	1	2	1
	Ewing Sarcoma			1				1
	Synovial sarcoma					1	1	
	Total		1	2	2	2	3	4

Discussion:

Maxillofacial tumours are vast group of tumours with different histopathological and clinical presentation.2,8 Knowledge about clinical features, age, primary site and sex distribution is very important for prompt diagnosis.2 Most of the paediatric maxillofacial tumours are often treated with antibiotics being mistaken for infection leading to the late diagnosis and treatment of such tumours.[9,10]

Most of the oral and maxillofacial tumours in our series of children were benign, confirming the results of others.11 Age group between 16-19 years was most commonly involved.

In this series, of all the benign lesions, the most common were vascular lesion (26%). It included hemangioma, vascular malformation and lymphangioma. Most of the vascular lesions were reported in the age group 16-19 years.

There are two categories of vascular anomalies of the head and neck based on characteristics of endothelial cells and clinical behavior: hemaniomas and vascular malformations. Hemangioma is more common vascular lesion of infancy. They are soft tissue masses with different sizes and are compressible.

These tumors show rapid mitotic activity and endothelial cell proliferation. After maturation blood flow through these lesions and endothelium becomes flattened. Hemangiomas typically presents in early infancy, grow rapidly, and undergo fatty replacement and involution by the time the patient reaches adolescence.
On the contrary vascular malformations are lesions resulting from abnormal blood or lymphatic vessel morphogenesis. These lesions are classified by the predominant type of vessel involved and include capillary, venous, lymphatic, and arteriovenous malformations (AVMs). Vascular malformation are present at birth although some may not become clinically apparent until late infancy or childhood and they do not involute.[12] Among the benign lesions, lymphangioma is rare, and our study composed of only 5.47%.They are soft and non tender masses and less likely to regress

spontaneously. [13]

Central giant cell granuloma was formerly regarded as reparative process and was accordingly called central giant cell reparative granuloma.[14] It is by far the most common of giant cell lesions of jaws. Our study correlated with the above study that this lesion was commonest among giant cell lesions with only one case presenting with peripheral giant cell. Our study found a predilection for males. Overall in benign tumours in children giant cell granuloma was the second common lesion (19%).

Fibro-osseous lesion included fibrous dysplasia (8.21%) and ossifying fibroma (6.84%) and a total of 15.06% of benign lesions. The preference for gender is almost negligible. In these lesions, the normal bone is replaced by fibrous tissue containing mineralized products. Fibrous dysplasia is a developmental tumour. Ossifying fibromas have been considered a variant of fibrous dysplasia based on histologicalsimilarities.[15]

All odontogenic tumours were benign. Majority of the odontogenic tumours were found in adolescents. This is in consistent with many studies.[16,17,18]

Ameloblastoma is a common benign odontogenic tumour of the jaw. In children and adolescents it shows wide age variation. Review of previous literature show that most of tumours were found in patients between 11 and 20 years old.[19]

In our study there was a relatively low prevalence of ameloblastoma (8.21%) out of all benign lesions.This incidence is almost similar to 8.7% reported by Keszler and Dominguez.[20]

Keratocyst (6.84%) was second common odontogenic tumour in our study. No case was diagnosed in the first decade of life, this may be due to the tendency of the tumour's inter medullary growth and initially lack of any obvious facial swellings.Keratocyst is thought to arise from dental lamina. Originally classified as a cyst but later on, in 2005World Health Organisation (WHO) renamed it as keratocystic odontogenic tumour, due to its aggressive nature, increase recurrence, and presence of tumour markers.[21]

Pyogenic granuloma is a common tumour in the oral cavity and mostly present in second decade of life. It is a small exophytic lesion, the surface of which may be smooth or lobulated and color varies from reddish to pinkish. Females are more affected than males due to hormonal changes.[22]

In our study period there presented a total of 4 cases with pyogenic granuloma. 3 cases were reported in males and one in female. It was described in 1980 as lobular capillary hemangioma based on histological findings.[23]

Odontomes are of mixed origin. They include both the epithelial and mesenchymal tissues. They are thought to be thecommonest type in children.[24]

In our study, odontome composed of 5.47% of benign lesions.

Two male patients presented with osteoma in the second decade of life. This is in accordance with study performed by Sayan et al.25 But they are uncommon in maxillofacial region. Moreover, based on histological and clinical features they cannot be differentiated from torus palatinus except that osteoma doesn't present in mid palate.[26]

Adenomatoid odontogenic tumour is considered as the most common true odontogenic neoplasm according to study performed by Jones and Franklin.27 In our study period just two cases, in the second decade of life, presented with this tumour.

Of salivary gland, pleomorphic adenoma was diagnosed in one child. It is one of the most common tumors of parotid gland in pediatrics.28 Lipomas are rare soft tissue tumours in children. Although it is the commonest mesenchymal neoplasms but its prevalence in maxillofacial region is less frequent.29 Our study found 1 case in maxillofacial region which presented in second decade of life.

Odontogenic fibroma was reported in one patient in first decade of life. It is a very rare benign tumour, less than 0.1% of all odontogenic tumours, considered to be of mesenchymal origin and usually present in the age range of 11-80 years.[30]

Myofibroma was also reported as a single case in the first decade of life. Its most commonly found in head and neck region and has presentation in wide age range. They are benign tumours and may be developmental or reactive.[31]

Gingival fibroma is often controversial in that that whether it should be categorized as true neoplasm or reactive hyperplasia.[32] We found one case of gingival fibroma.

Only a single case of neuroectodermal tumours of infancy was reported in children of less than 1year. No other malignant or benign tumours were found below the age of 1year.

Head and neck malignancies in children are uncommon, yet 5% of all childhood cancers are head and neck malignancies, affecting almost 550 children annually.[33]

In our study group a total of 7 children appeared with malignant tumours of oral and maxillofacial region evenly dispersed in age group 6-19 years. Male and female ratio was almost same (0.75:1). Carcinoma was seen more than sarcoma. Three cases of Squamous cell carcinoma appeared in age group 12-19years.This is quite alarming as a recent studyby Liu X et al also found that

incidence of head and neck squamous cell carcinoma in young adults is increasing.[34]

As mentioned earlier only two cases of sarcomas were found in the study period.

Conclusion:

According to this study most common tumors were benign vascular tumors followed by benign giant cell lesion. Ameloblastoma was reported as most common odontogenic tumor. Among malignancies 4 out of seven patients had carcinomas.

Limitations and Recommendations:

Although this study describes the relative frequency of diagnosed lesions, presented in the past 4 years and 5 months rather than actual prevalence in children in Khyber Pakhtunkhwa province. Possibly the information might not be well enough e.g. the data on ethnicity and demographic information was ignored and the pathological specimen mightbe insufficient for diagnosis.

This would have been helpful in comparing data with other regions and communities. It will be valuable if data on biopsy form was collected in a format considering geographic locations and ethnic differences. The rising number of carcinoma in children is alarming and new diagnostic strategies should be acquired in order to help in the early diagnosis ofsuch tumors.

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Author Contributions

1. Muntaha S: Conception and study design, analysis, and interpretation of data, drafting the manuscript, critical review
2. Noreen N: Conception and study design, critical review
3. Khan M: Acquisition of data, drafting the manuscript
4. Younus M: Analysis and interpretation of data, critical review
5. Nisar M: Acquisition, analysis, and interpretation of data
6. Rashid M: Drafting the manuscript, critical review, approval of the final version to be published