

CLINICOPATHOLOGICAL ANALYSIS OF ODONTOGENIC CYSTS IN A SELECTED PAKISTANI POPULATION

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ABSTRACT

Introduction: The cysts of the jaw are broadly classified as odontogenic and non-odontogenic. The odontogenic cysts are pathological fluid filled cavities lined by odontogenic epithelium and further sub-classified as inflammatory and developmental. The objective was to determine the types, frequency, distribution, and demographic characteristics of odontogenic cysts in our setup.

Methodology: This 8 years retrospective study (from January 2003 to December 2010) was conducted at Histopathology department of Armed Forces Institute of Pathology, Rawalpindi (Pakistan). The histopathology record of odontogenic cysts were reviewed for age, gender, site, associated tooth and histopathological diagnosis. The data was analysed by using SPSS soft ware package version 17.

Results: The data revealed that periapical, dentigerous and odontogenic keratocysts were the most commonly reported odontogenic cysts which reported in the age range of 4 to 72 years (mean 29.09 ± 13.53 years). Amongst them 67.7% were males and 32.3% females with peak incidence in the 2nd and 3rd decades. The association of age and teeth with different type of cysts was statistically significant while gender association was insignificant although having predilection for males. None of the case of odontogenic keratocyst was found in deciduous teeth.

Conclusion: The statistically significant association of different types of Odontogenic cysts with the age, site, teeth and male prevalence reveals that demographic knowledge can be helpful in early diagnosis and their prompt treatment.

Key Words: Odontogenic cysts, Periapical cyst, Dentigerous cyst, Odontogenic keratocyst, Demography, Frequency.

INTRODUCTION

The cysts of the jaw are broadly classified as odontogenic and non-odontogenic. The odontogenic cysts are pathological fluid filled cavities lined by odontogenic epithelium and further sub-classified as inflammatory and developmental.¹ The demographic study of the odontogenic cysts can be of great help in their final diagnosis and treatment planning, thus avoiding their complications.^{2,3} However, different studies conducted in different populations in this regard shows variation in results which can be attributed to difference in genetic, environmental, geographical or methodological variations.^{4,5} Moreover, in our country only one study in Khyber Pakhtunkhwa (NWF) province was done to see their frequency and demography.⁶

Keeping all this in mind, the present study was planned with the aim to determine the types, frequency, distribution, and demographic characteristics of odontogenic cysts diagnosed in 8 years span of time in our setup at AFIP Rawalpindi (Pakistan).

METHODOLOGY

Study Design and Sample Collection

This retrospective study was carried out at the Histopathology department of the Armed Forces Institute of Pathology (AFIP) Rawalpindi (Pakistan). Histopathology record of odontogenic cysts (specimen referred from Armed Forces Institute of Dentistry Rawalpindi and various other dental clinics and hospitals of the vicinity) during the 8 years period (January 2003 to December 2010) were collected. The histopathological H&E diagnosis was considered as the final diagnosis. The data collected that included cases of all the age groups; both children and adults was reviewed for age, gender, site, associated tooth and histopathological diagnosis of these lesions.

Statistical Analysis

The data was entered and analyzed by using SPSS soft ware package version 17. The descriptive statistics and frequency for every type of Odontogenic

cyst was calculated and their association with age, gender, site (maxilla or mandible) and associated tooth was noted. Chi square test was applied to determine the association of these parameters with every type of cyst. p-value was calculated and its value of 0.05 or less was considered as significant.

RESULTS

During this study period of 8 years, a total of 268 cases of odontogenic cysts were diagnosed at AFIP Rawalpindi. The data revealed that periapical, dentigerous and odontogenic keratocyst were the most commonly reported cysts; comprising 98.9% of all the odontogenic cysts and their respective percentage noted was 51.5, 28.7 and 18.7%. A very small number of cases of calcifying odontogenic (0.7%) and glandular odontogenic (0.4%) cyst were also reported and not even a single case in this entire span was diagnosed as of eruption cyst, gingival cyst, lateral periodontal cyst or of buccal bifurcation cyst. Residual periapical cyst was included in the entity of periapical cyst (Figure 1).

All these reported cases were found in the age range of 4 to 72 years (mean 29.09 ± 13.53 years) with peak incidence in the 2nd and 3rd decades of life (Table 1). Out of these 268 cases, 67.7% were males and 32.3% females with male to female ratio of almost 2:1 (Table 2). The association of age with different type of cysts showed statistically significant results (P < 0.05) while gender association with each type of cyst was statistically insignificant (P > 0.05). Mandible and maxilla were the two sites involved in all the cases being 53.9% and 46.1% respectively (Table 3). This association of site with the ty-

pe of cyst was also of high statistical significance (P = 0.000).

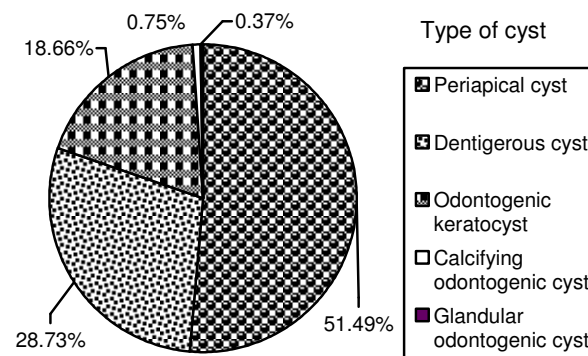


Fig. 1: Frequencies of Odontogenic cysts.

The association of teeth with all these odontogenic cysts is mentioned in table 4. Statistically this also showed significance relationship. Periapical cyst was predominantly found in maxillary incisors followed by mandibular incisors and canines. None of its case was noted to be associated with maxillary or mandibular third molar teeth. In deciduous teeth, it was mostly associated with mandibular molars.

Dentigerous cyst was commonly associated with impacted mandibular 3rd molars, followed by maxillary canines while Odontogenic Keratocyst was mostly associated with mandibular ramus area. None of its case was found in deciduous teeth.

DISCUSSION

Periapical, dentigerous and odontogenic keratocyst were found to be the most frequent types of odontogenic cysts in our study; comprising 98.9% of all. In a French study conducted in 2006, these three entities comprised 94.9%.⁷ Almost similar observations with some variation were reported in other studies conducted in different parts of the world. The respective frequencies of these three cysts were 51.5%, 28.7% and 18.7% respectively which also matched with the results of other studies.^{4,5} However, in contrast to our study, some studies mentioned that odontoge-

Table 1: Association of age with the type of odontogenic cyst.

Age category	Type of Cyst				
	Periapical	Dentigerous	Odontogenic keratocyst	Calcifying odontogenic	Glandular odontogenic
< 10 years	4 (2.9%)	13 (16.8%)	--	--	--
10 – 20 years	21 (15.2%)	21 (27.2%)	20 (40%)	--	--
20 – 30 years	42 (30.4%)	22 (28.5%)	12 (24%)	2 (100%)	1 (100%)
30 – 40 years	41 (29.7%)	14 (18.1%)	8 (16%)	--	--
40 – 60 years	25 (18.1%)	7 (9.09%)	7 (14%)	--	--
> 60 years	5 (3.6%)	--	3 (6%)	--	--
Total	138	77	50	2	1

Chi value 48.63 df = 20 P value 0.000 (P < 0.05)

nic keratocyst was more common than the dentigerous cyst.^{6,8-10} Moreover, two Nigerian studies reported dentigerous cyst the commonest amongst three.^{11, 12}

These odontogenic cysts were mostly found in patients in their 3rd decade of life followed by 2nd and 4th decades. Similar trend was reported in another Pakistani study done in the province of Khyber Pakhtunkhwa.⁶ The peak incidence of periapical cyst was seen in 3rd and 4th decades, while dentigerous cyst occurred more in 2nd and 3rd decades. This finding was also in accordance with the outcomes of a study done on Ethani population.¹³

Table 2: Gender association with the type of odontogenic cyst.

Gender	Type of cyst				
	Periapical	Dentigerous	Odontogenic keratocyst	Calcifying odontogenic	Glandular odontogenic
Male	92 (66.6%)	50 (64.9%)	38 (76%)	1 (50%)	1 (100%)
Female	46 (33.3%)	27 (35%)	12 (24%)	1 (50%)	--
Total	138	77	50	2	1

Chi value 2.679 df = 4 P value 0.613 (P < 0.05)

Table 3: Association of site with type of odontogenic cyst.

Site	Type of cyst				
	Periapical	Dentigerous	Odontogenic keratocyst	Calcifying odontogenic	Glandular odontogenic
Maxilla	81 (58.7%)	30 (39%)	12 (24%)	2 (100%)	0
Mandible	57 (41.3%)	47 (61%)	38 (76%)	0	1 (100%)
Total	138	77	50	2	1

Chi value 23.34 df = 4 P value 0.000 (P < 0.05)

Table 4: Association of teeth with types of odontogenic cyst.

Location in the jaw according to teeth	Type of cyst (cases & their percentage)				
	Periapical	Dentigerous	Odontogenic keratocyst	Calcifying odontogenic	Glandular odontogenic
Maxillary anterior teeth (canine – canine)	58 (42.02%)	18 (23.3%)	5 (10%)	2 (100%)	0
Maxillary posterior teeth (excluding 3rd molar)	23 (16.6%)	6 (7.8%)	4 (8%)	0	0
Mandibular anterior teeth (canine – canine)	30 (21.7%)	10 (12.9%)	6 (12%)	0	0
Mandibular posterior teeth (excluding 3rd molar)	27 (19.5%)	21 (27.2%)	24 (48%)	0	1 (100%)
Maxillary 3rd molar	0	7 (9%)	3 (6%)	0	0
Mandibular 3rd molar	0	15 (19.4%)	8 (16%)	0	0
Total	138	77	50	2	1

Chi value 230.97 df = 156 P value 0.000 (P < 0.05)

However, odontogenic keratocyst peak incidence noted in the 2nd decade of life differs from the study done by Petia and his colleagues in Bulgaria. Likewise, the mean age of patients of odontogenic cysts was 35.30 ± 0.73 years mentioned by them also shows some variation from our finding of 29.09 ± 13.53 years.¹⁴

In our study all types of odontogenic cysts showed male predominance which is in accordance with the results of numerous other studies.^{10,15,16} However, one Brazilian study reports the dominance of females⁵ while another study conducted in Chile reports radicular cyst to be more prevalent in females.¹⁶ This might be due to genetic, environmental or

social and cultural differences.

Mandible and maxilla were the only two sites involved by all these odontogenic cysts seen in our study; being 53.9% and 46.1% respectively. Our observation of distribution differs from the finding of a regional study where maxilla was comparatively affected more.⁶ This might have resulted because of difference in methodology and variation in study period. However, periapical cyst involvement of maxilla (58.7%) more matches with the result of this said study⁶ but is in contrast to other studies where mandible was more commonly involved.^{1,17} Dentigerous and odontogenic keratocysts were found in mandible in majority of cases; 61% and 76% respectively. A similar trend was noted in studies done on Jordanian and UK populations.^{4,18} However, it does not agree with the findings of Ansari et al where dentigerous cyst was more prevalent in maxilla and also from the results of Ortega and his colleagues (study done in Chile) where OKC commonly involved the maxilla.^{6,19}

The most common tooth affected by periapical cyst was maxillary incisors followed by maxillary canines (42.02%). In the mandible it involved canine to canine area (21.7%). The same trend was seen in Khyber Pakhtunkhwa (Pakistan) and Jordanian populations.^{6,18} However, it differed in UK population where more common site was mandibular molar region.⁴ None of the case of periapical cyst was associated with maxillary or mandibular third molar tooth, while in deciduous teeth was mostly associated with mandibular molars. The inflammatory nature of periapical cyst and its involvement of non vital teeth facts can somewhat explain the association with maxillary anterior teeth which are more prone to caries and trauma.

The occurrence of dentigerous cyst mostly in the maxillary and mandibular 3rd molar region (28.4%) and in maxillary canines (16.9%) shows its most frequent association with impacted teeth. Odontogenic keratocyst was mostly found in mandibular premolar / molar (48%) and in the 3rd molar region (16%). Our findings are in consistent with previous studies.^{1,14,16,20} Although our study included maximum data of all Odontogenic cysts, but glandular and calcifying odontogenic cyst was not dealt in detail as their percentage reported was too small.

It is *concluded* the present study confirms that periapical, dentigerous and odontogenic keratocyst are the most commonly reported odontogenic cysts (98.9%) in our setup; relative frequencies being 51.5%, 28.7% and 18.7% respectively. Our results are in accordance with other studies in this regard with some variations. The male dominance and statistically significant association of age, site, and teeth with different types of odontogenic cysts reveals

that demographic knowledge can be helpful in early diagnosis and prompt treatment of these lesions.

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