

Prevalence of odontogenic cysts in patients visiting a tertiary Dental Care Hospital in North India- An 8 year experience

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Abstract

Aims and Objectives: The present study aims at evaluation of age, sex and site of occurrence related prevalence of Radicular cyst, Dentigerous cyst, Odontogenic keratocyst (OKC), Lateral Periodontal cyst, Residual cyst, Adult Gingival cyst, Calcifying odontogenic cysts.

Materials and Methods: During 8 year period (From 2010 to 2017), 1000 patients with cystic lesions of the jaws were analysed. All patients underwent clinical examination and plain film radiography (panoramic, periapical, and occlusal views). Some of them were referred for CBCT or computed tomography (CT) with a multiplanar reconstruction program (MPR). Age, sex, type of cyst and location were recorded in designed performa. The treatment modalities used for the management of cysts are marsupialization, enucleation, enucleation with bone grafting or resection under local or general anaesthesia depending on the case.

Results: Radicular cyst(45.2%) is most common cyst followed by dentigerous cyst(23.2%), Odontogenic keratocyst (13.4%), lateral periodontal cyst(8.9%), residual cyst(4.5%), Calcifying odontogenic cyst (4.4%) followed by the least common occurring adult gingival cyst (1.1%). The mandibular posterior region (41.3%) is most predilected site of occurrence of cysts in orofacial region however maxillary anterior region (17.7%) is least predilected site of occurrence.

Conclusion: The radicular cyst is most common cyst of oral cavity while adult gingival cyst is least common cyst.

Keywords: Cyst, Jaw bone, Prevalence, Odontogenic, Nonodontogenic.

Introduction

Odontogenic cysts (OC^{'S}) are pathological cavities lined with odontogenic epithelium which loom in both jaws and intermittently in the oral soft tissues principally the gums.¹ Odontogenic cysts dawn at any age and remain asymptomatic and therefore unnoticed for long periods of time. In most cases, routine x-rays reveal conjecture of OC^{'S} existence. Their origin is closely related to dental ontogeny. 90% of OC^{'S} are formed from odontogenic epithelium or its embryonic remnants nevertheless in most cases their etiology is still unknown.²⁻⁵ Odontogenic cyst (OC^{'S}) are divided into two groups on the basis of their origin: developmental and inflammatory. OC^{'S} are unique in that they only affect the oral and maxillofacial region which are characterized by resorption of bone and develop from the components of the odontogenic epithelium or its residuals which remain trapped within the gingival tissue or bone.⁶ Inflammatory cyst is associated with inflammation while developmental cyst is of unknown etiology.⁷ Radicular and dentigerous cysts are relatively common and can be easily diagnosed⁸. Clinical and radiological presentations are almost similar for many of these cysts hence clinical misdiagnosis is possible. Some of these are known to have an aggressive behavior and propensity to recur. So correct diagnosis of these lesions is very essential.⁹ Hence, surgically excised tissue should be duly studied histopathologically and properly diagnosed to ensure appropriate treatment. Orofacial cysts and tumors are

known to exhibit geographic variations in prevalence and pattern. The knowledge of the epidemiology of odontogenic cysts and tumors is limited in a developing nation like India which may be attributed to inadequate documentation in our hospitals and health care centres.¹⁰ Studies on prevalence of odontogenic cysts have been carried out in a number of countries.^{6-8,11} But it is quite sparse in India. The present study was designed to know the relative frequency and information regarding the demographic profile of these lesions in Indian population and compare the findings with information reported in other parts of the world.

Materials and Methods

This prospective study is carried out from March 2010 to march 2017 at department of Oral medicine and radiology, King George Medical University, Lucknow. During these 8 years, 1000 study subjects with cystic jaw lesions were recruited for this study. The diagnosis of jaw cysts in all study subjects were done by clinical examination and radio-histopathological examination. All patients underwent clinical examination and plain film radiography (panoramic, periapical, and occlusal views). Depending on the case, some of them were referred for CBCT or computed tomography (CT) with a multiplanar reconstruction program. Age, sex, type of cyst and location were recorded in designed performa and statistical analysis was done using SPSS 21 version.

Results



Fig. 1: Panoramic radiograph showing the periapical radiolucency in maxillary 1st premolar region



Fig. 4: Saggittal section of CBCT showing multilocular radiolucency with impacted 1st and 2nd mandibular molar in left side suggestive of Dentigerous cyst

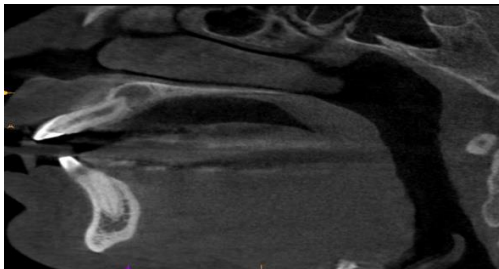


Fig. 2: Saggittal section of CBCT showing periapical radiolucency in maxillary 1st Premolar region suggestive of radicular cyst



Fig. 5: Panoramic radiograph showing odontogenic keratocyst



Fig. 3: Panoramic radiograph showing multilocular radiolucency in left mandibular 1st molar region suggestive of Dentigerous cyst



Fig. 6: Saggittal section of CBCT showing multilocular radiolucency

Table 1: Showing mean age, minimum and maximum age of occurrence of cyst

| | N | Range | Minimum | Maximum | Mean | Std. Deviation |
|---------|------|-------|---------|---------|-------|----------------|
| Age | 1000 | 44 | 15 | 59 | 33.99 | 10.009 |
| Valid N | 1000 | | | | | |

Table 2: Showing age wise distribution of study population

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------|-----------|---------|---------------|--------------------|
| Valid | Below 18 years | 33 | 3.3 | 3.3 | 3.3 |
| | 18 to 35 years | 558 | 55.8 | 55.8 | 59.1 |
| | 36 to 50 years | 331 | 33.1 | 33.1 | 92.2 |
| | 51 to 60 years | 78 | 7.8 | 7.8 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 3: Showing gender wise distribution of study population

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|--------|-----------|---------|---------------|--------------------|
| Valid | Male | 767 | 76.7 | 76.7 | 76.7 |
| | Female | 233 | 23.3 | 23.3 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 4: Showing the prevalence of radicular cyst

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 452 | 45.2 | 45.2 | 45.2 |
| | No | 548 | 54.8 | 54.8 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 5: Showing the prevalence of dentigerous cyst

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 232 | 23.2 | 23.2 | 23.2 |
| | No | 768 | 76.8 | 76.8 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 6: Showing the prevalence of Odontogenic keratocyst (OKC)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 134 | 13.4 | 13.4 | 13.4 |
| | No | 866 | 86.6 | 86.6 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 7: Showing the prevalence of lateral periodontal cyst

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 89 | 8.9 | 8.9 | 8.9 |
| | No | 911 | 91.1 | 91.1 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 8: Showing the prevalence of Residual cyst

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 45 | 4.5 | 4.5 | 4.5 |
| | No | 955 | 95.5 | 95.5 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 9: Showing the prevalence of Adult Gingival cyst

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 11 | 1.1 | 1.1 | 1.1 |
| | No | 989 | 98.9 | 98.9 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 10: Showing the prevalence of calcifying odontogenic cyst (COC)

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 44 | 4.4 | 4.4 | 4.4 |
| | No | 956 | 95.6 | 95.6 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 11: Showing the predilection of occurrence of cyst in maxillary anterior region

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 177 | 17.7 | 17.7 | 17.7 |
| | No | 823 | 82.3 | 82.3 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 12: Showing the predilection of occurrence of cyst in maxillary posterior region

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 178 | 17.8 | 17.8 | 17.8 |
| | No | 822 | 82.2 | 82.2 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 13: Showing the predilection of occurrence of cyst in mandible anterior region

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 232 | 23.2 | 23.2 | 23.2 |
| | No | 768 | 76.8 | 76.8 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

Table 14: Showing the predilection of occurrence of cyst in mandibular posterior region

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 413 | 41.3 | 41.3 | 41.3 |
| | No | 587 | 58.7 | 58.7 | 100.0 |
| | Total | 1000 | 100.0 | 100.0 | |

The study group consists of 1000 study subjects having mean age of 33.9+10.09 years. However the minimum age of occurrence was 15 years of age with maximum age being 59 years (**Table 1**). The study population is divided in 4 age groups. Most of study subjects were between age group of 18-35 years(55.8%) followed by 36-50 years(33.1%), 51-60 years(7.8%) and <18years(3.3%) (**Table 2**). The study population (N=1000) consists of 76.7% male and 23.3% female (**Table 3**). The study population (N=1000) consists of 452 study subjects(45.2%) with radicular cyst (**Table 4**), 232 study subjects(23.2%) with dentigerous cyst (**Table 5**), 134 study subjects(13.4%) with Odontogenic keratocyst (OKC) (**Table 6**), 89 study subjects (8.9%) with lateral periodontal cyst (**Table 7**), 45 study subjects(4.5%) with Residual cyst(**Table 8**), 11 study subjects (1.1%) with Adult Gingival cyst (**Table 9**) and 44 study subjects (4.4%) with calcifying odontogenic cyst (**Table 10**). On looking from Table1 to Table 10, It was concluded that radicular cyst (45.2%) is most common cyst followed by dentigerous cyst (23.2%), Odontogenic keratocyst (13.4%), Lateral periodontal cyst (8.9%), Residual cyst(4.5%), Calcifying odontogenic cyst (4.4%) followed by the least common occurring adult gingival cyst (1.1%). In the study population, 17.7% cyst is commonly found in maxillary anterior region (**Table 11**). However the occurrence of cyst in maxillary posterior region is 17.8% (**Table 12**). So it was concluded that the frequency of occurrence of cyst in maxillary anterior and posterior region was almost same. The prevalence of occurrence of cysts in mandibular anterior region was found to be (23.2%) (**Table 13**). However higher prevalence rate (41.3%) is reported in mandibular posterior region (**Table 14**). So it was concluded that mandibular posterior region (41.3%) is most predilected site of occurrence of cysts

in orofacial region however maxillary anterior region is least predilected site of occurrence.

Discussion

Studies of cysts and tumors of the oral cavity from several parts of the world indicate that knowledge of the location, frequency, and basic clinical features of these lesions is essential to assess the expression of these lesions in diverse populations as well as to identify the groups at risk. The incidence and epidemiological behavior of odontogenic lesions exhibits geographical variations in different regions of the world.¹² The present study solely focuses on the relative frequency and clinical and demographical characteristics of OC^{'s} in a north Indian population. 1000 patients with cystic lesions of the jaws were screened of OC^{'s} and reviewed. It was observed that 76% of study population were males which suggested that the odontogenic cysts were found more in the male population. Johnson et al¹³ also reported that males were more suffering from OC^{'s} along with the other studies which gave similar results.¹⁴⁻²⁰ On the contrary, female predominance was found in Brazilian population.²¹ In present study group maximum patients i.e, males and females were in between 18-35 years (55.8%) followed by 36-50 years (33.1%). So it was observed that peak incidence of OC^{'s} was between 18-35 years which was slightly consistent with the findings of other studies by Niranjana et al,²² Ochsenius et al,²³ Avelar et al²⁴ and Borges et al²⁵ who observed that the peak incidence of odontogenic cysts was between 20 and 29 years.

Radicular cysts represented 45.2% of all reported cysts and it was found in 452 cases out of which 328 (42.8%) are males and 124(53.2%) are females with an incidence peak at the 18-35 years (64.8%) of age group

followed by 36-50 years (34.9%) of age group. The dentigerous cysts which represented 23.2% of all reported cysts and was found in 232 cases out of which 137 (17.9%) were males and 95 (40.8%) were females with an incidence peak at 18-35 years (73.7%) of age group followed by below 18 years (13.7%) of age group. Odontogenic keratocysts represented 13.4% of all reported cysts and it was found in 134 cases out of which 120 (15.6%) are males and 14 (6%) are females with an incidence peak at the 36-50 years (66.4%) of age group followed by 18-35 years (33.5%) of age group. On the other hand Ramachandra et al²⁶ observed that Odontogenic keratocysts represented 22.65% of all reported cysts.

A presumptive explanation to condone this high prevalence of radicular cyst that it could be related to caries. Radicular cyst in most cases was an aftermath of deep carious lesions and dental pulp necrosis. Pulp necrosis, colonization and proliferation of microorganisms within the root canal system, release of bacteria toxins and inflammatory mediators into the periapical region and a combination of factors involving epithelial-stromal interaction lead to the formation of radicular cyst. On the other hand high prevalence of dentigerous cyst was cardinaly related to high prevalence of impacted teeth due to the fact that impacted teeth was indispensable condition to develop a dentigerous cyst. An average of worldwide rate of third molar impaction of 24.4%²⁷ had been reported.

On association of site of lesion with gender, it was observed that maximum cases were found in mandibular posterior region (413) out of which 281 (68%) were males and 132 (32%) were females followed by mandibular anterior region in which it was observed that total 232 cystic lesions were found out of which 187 (80%) were males and 45(19%) were females. So, we inferred that cysts occurred more frequently in men than in women in accord with findings reported in other studies that were conducted by Ledesma et al²⁸ and Prock et al.²⁹

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