Original Article

AGE AND GENDER DISTRIBUTION OF ODONTOGENIC CYSTS - A RETROSPECTIVE STUDY

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Abstract

Odontogenic cysts are considered relatively rare cystic lesions which affect the maxillofacial region. They can be classified based on their origin as Inflammatory cysts or Developmental cysts. These cysts are characterised by slow growth and a tendency to expand. In spite of presenting with benign biological behaviour, they can reach considerable size if not diagnosed or treated appropriately. There is however limited literature regarding the age and gender distribution of odontogenic cysts in the geographical location where the study is undertaken. The aim of the present study is to evaluate the age and gender distribution along with the frequency and site of occurrence of Odontogenic cysts (OC). It is a University/Hospital based study. 33 patients diagnosed with Odontogenic cystic lesions were included in the study. The age, gender, type of odontogenic cyst and site affected were evaluated. The data collected was imported to IBM SPSS Version 20 for analysis. It was observed that radicular cyst was the most frequently occurring cyst(54%) and greater predilection for OCs was seen in males than in females. Higher frequency of occurrence of OCs in the upper arch (53%) was observed with significant association between cyst type and site ($p<0.05$). Most common age of occurrence was in the 2^{nd}-3^{rd} decade of life. Within the limits of the study, it was observed that a greater prevalence of radicular cysts was seen, in the 2nd-3rd decade of life, with higher frequency in the upper arch and in male population.

Keywords: Odontogenic cyst, Radicular cyst, Dentigerous cyst, Odontogenic keratocyst

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INTRODUCTION:

Odontogenic cysts (OCs) are considered relatively rare cystic lesions which affect the maxillofacial region (Tortorici *et al.*, 2008; Gayathri and Don, 2017). Non Odontogenic cysts also occur in the oral cavity and arise from the ectoderm involved in the development of facial tissues(Slootweg, 2009). OCs have been characterised as bone destructive and develop from the components of the odontogenic epithelium or its residue which remains trapped in the bone or gingival tissues (Acikgoz *et al.*, 2012; Packiri, Gurunathan and Selvarasu, 2017) . According to the World Health Organisation (WHO) International Classification of OCs, they are classified into two main groups that reflect on their pathogenesis.

The first group consists of those cysts which are of inflammatory origin including Radicular cysts which develop as a consequence of advanced caries and pulpal necrosis(Kramer, 1992; Kumar and Sneha, 2016; Rahman and Mp, 2017) , whereas the second group consists of lesions of developmental origin including dentigerous cysts and odontogenic keratocysts. These cysts are characterised by slow growth and a tendency to expand and in spite of presenting with benign biological behaviour(Marimuthu *et al.*, 2018), they can reach considerable size if not diagnosed(Mp and Rahman, 2017) or treated appropriately(Ochsenius *et al.*, 2007; S. K. Mp, 2017; Rao and Santhosh Kumar, 2018) .

Though there is a lack of concrete evidence, the several risk factors believed to contribute to OC formation are dental trauma(Jain *et al.*, 2019; Sweta, Abhinav and Ramesh, 2019), gender variations, high caries index at early age, long term chronic processes(Santhosh Kumar Mp, 2017) and oral hygiene(Browne, 1972; Ledesma-Montes, Hernández-Guerrero and Garcés-Ortíz, 2000; Patturaja and Pradeep, 2016) . Radicular cysts are thought to be the most common cysts of the jaws(Wood *et al.*, 1988). Dentigerous cysts enclose the crown of the unerupted tooth and are thought to originate from a tooth follicle(Waldron, 1972; Benn and Altini, 1996) . Odontogenic keratocysts are aggressive lesions arising from the dental lamina and are known for their high frequency of recurrence(Brannon, 1977).Our team has extensive knowledge and research experience that has translate into high quality publications (Kumar *et al.*, 2006;

Devi and Gnanavel, 2014; Varghese *et al.*, 2015; Sivamurthy and Sundari, 2016; Chen *et al.*, 2019) (Rao and Kumar, no date; Nair, Jeevanandan and Vignesh, 2018; Anbu *et al.*, 2019; Sekar *et al.*, 2019; Johnson *et al.*, 2020).The aim of the present study is to determine the relative frequency of OCs as well as their age, gender and site wise distribution.

MATERIALS AND METHODS:

Study Design/ Setting:

The present study is a University/ Hospital based study. The pros of the study include the comprehensive digital data available from the online database. The cons of the study include the fact that it is limited to an isolated population. 33 patients diagnosed with odontogenic cystic lesions were included in the study.The study was commenced after approval from the scientific review board, and the ethical clearance was obtained from the ethical committee of the University (SDC/SIHEC/2020/DIASDATA/0619-0320)

Sampling:

The Type of study was Retrospective. Data for the study was collected from June 2019 to March 2020. To minimize the sampling bias, consecutive sampling was done. 33 Case sheets were reviewed for the study. Cross verification of the data for errors was done with the aid of an external reviewer and photographic evaluation. The data was generalized to the South Indian population.

Data Collection:

Data of the age, gender, type of OC and affected site of the study participants was retrieved. Data was systematically compiled in Microsoft Excel. Incomplete or censored data was excluded from the study. The final records were imported for analysis to IBM SPSS Version 20.0.

Statistical Analysis :

IBM SPSS 20.0 Software was used for data analysis. The Independent variables included- type of OC. The Dependent variables included- age, gender and Site affected. Descriptive and Inferential statistics were used. Inferential statistics included Chi Square Test. Descriptive statistics included frequency distribution of the type of OCs.

RESULTS AND DISCUSSION

Out of the 33 patients reviewed, 39% were female, 61% were males. Considering the distribution of the Odontogenic cysts, the majority of the patients presented with Radicular cysts(54%), and they were seen prevalently in patients below 31 years of age(33.33%).

Males are shown to have greater predilection for Dentigerous cyst compared to females (12%). However no significant difference was found between gender and type of cyst, P=0.74, Chi Square test(Figure 1).

Higher prevalence of OCs has been seen between the 2nd-3rd decade of life. However there is no statistically significant association with age and type of odontogenic cyst, P>0.05, Chi Square test.(Figure 2).

Higher prevalence of OCs was seen in the upper arch (53%). The association between the type of OC as well as the anatomic site was not found to be significant, P>0.05, Chi Square Test.(Figure 3).

Odontogenic cysts are benign lesions of the maxillary and mandibular bones(Patil *et al.*, 2017) . To reach the correct diagnosis, we require extensive clinical, radiographic as well as histopathological study (Núñez Urrutia, Barbosa de Figueiredo and Gay Escoda, 2010; Steele *et al.*, 2015). Various studies over different geographical areas have shown varying frequencies of occurrence of odontogenic cysts. Frequency of OCs in biopsies of Oral pathologies have shown to be 17.2% in the Canadian population, while Tay et al, reported 14.9% of biopsies in Singaporean population and Mosqueda et al found a figure of 11.5% of biopsies to be OC (Daley, Wysocki and Pringle, 1994; Tay, 1999; Mosqueda-Taylor *et al.*, 2002). Radicular cysts were found to be the most frequently occurring OC in the present study (54%) while dentigerous cysts were found in (15%) of the cases which is similar to the study by Koseoglu et al, where 59% and 14% of the cases were found to be Radicular and dentigerous cysts respectively(Koseoglu, Atalay and Erdem, 2004). In the present study males(80%) have been shown to have greater predilection for dentigerous cysts compared to females. These findings are consistent with those in a study by Oschenius et al. However no significant difference between the type of cyst and the gender was found in our study.

Radicular cysts were found in greater frequency in the upper arch in the present study. This is in accordance with a study by Nunez et al(Núñez Urrutia, Barbosa de Figueiredo and Gay Escoda, 2010) and many other studies but contrary to the findings of Avelar et al (Avelar *et al.*, 2009). Significant association between the affected site and type of cyst was found in our study.Our institution is passionate about high quality evidence based research and has excelled in various fields (Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Mathew *et al.*, 2020). We hope this study adds to this rich legacy.

Dentigerous cyst was found in the third highest frequency which differed from the findings of a study by Ahlfors et al, which found Dentigerous cyst as having the second highest frequency(Ahlfors, Larsson and Sjögren, 1984). OCs were found in higher prevalence between the 2nd-3rd decade of life in the current study which was in accordance with a study by Meningaud et al(Meningaud *et al.*, 2006). Though no strong association could be found between the age and type of odontogenic cyst in the present study it could be attributed to the limited sample size of the study. The greater prevalence of OCs in males than in females is consistent with a study by Prockt et al, and can be attributed to the fact that males have a greater susceptibility to trauma and poor oral hygiene when compared to females(Prockt *et al.*, 2008; Jesudasan, Wahab and Sekhar, 2015; Christabel *et al.*, 2016; Abhinav *et al.*, 2019) . The findings of this study indicate that radicular cysts are the most prevalent OCs which mostly occur in the 2nd-3rd decade in the upper arch. The limitations of this study are the small sample size and that it cannot be generalized to a larger population. Further scope of the study involves study of a larger population and further consideration of Risk factors.

CONCLUSION:

Within the limits of the study, the distribution of OCs was found to be predominant in males, in the second and third decade of life, with the upper arch being the most common site and radicular cyst being the most prevalent type of cyst. This is in consensus with many existing studies. Hence it can be concluded that odontogenic cysts distribution in our population is comparable to other geographical locations.

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CONFLICT OF INTEREST: The authors declare no conflict of interest.

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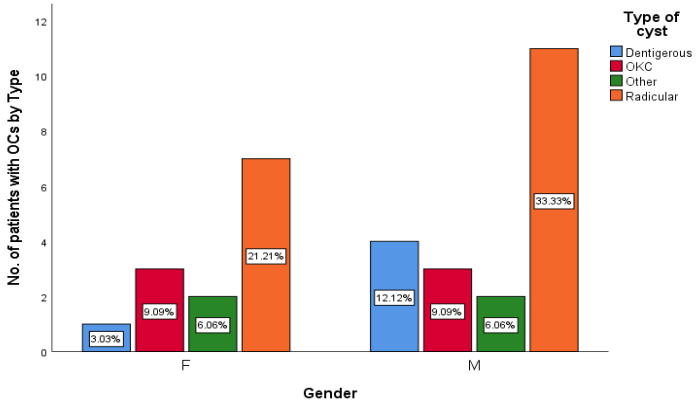

Figure 1: Bar graph showing association between Gender and Type of cyst where, X axis denotes the number of patients in both Genders (Male and Female) and Y axis denotes the number of patients with OCs by Type. Radicular cyst (Orange) is observed to be the most commonly occurring cyst, followed by Dentigerous cyst (Blue). Dentigerous cyst appears to be more prevalent in males than females. Chi square test; p-value = 0.73; not statistically significant.

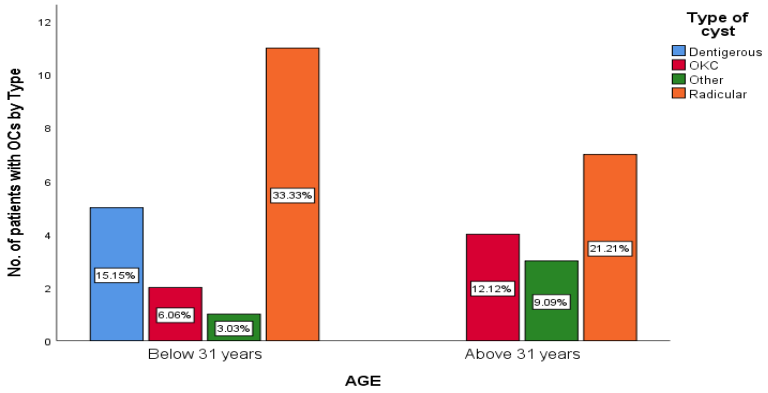

Figure 2: Bar graph depicting association between Age and Type of cyst where, X axis denotes the age wise distribution of patients (above 31 years of age and below 31 years of age) and Y axis denotes the number of patients

with OCs by Type. However higher prevalence of OCs has been seen between the second and third decade of life. Radicular cyst (Orange) followed by Dentigerous cyst (Blue) are observed to occur more frequently in patients below 31 years of age. Chi square test; p-value = 0.07; not statistically significant.

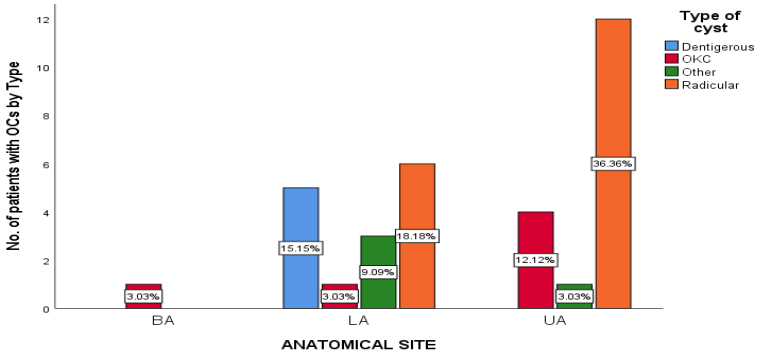

Figure 3: Bar graph showing association between site of occurrence and Type of cyst; where X axis denotes the Site wise distribution of patients (BA- Both arches, LA-lower arch, UA-Upper arch) and Y axis denotes the number of patients with OCs by Type. Higher prevalence of Radicular cyst (Orange) was seen in the upper arch and Dentigerous cyst (Blue) was seen in the lower arch. Chi square test; p-value = 0.02; hence statistically significant.