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PREVALENCE OF ODONTOGENIC CYSTS AND TUMORS IN KANCHEEPURAM DISTRICT, CHENNAI, TAMIL NADU: A RETROSPECTIVE STUDY OF 158 CASES

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ABSTRACT

Aim: The purpose of this study was to determine and collate the prevalence of odontogenic cysts and tumors in Kancheepuram dist. of Tamil Nadu over a period of 8yrs and to compare with other national and international studies. **Materials and methods:** Data for this study was ascertained from the reports of patients diagnosed with OCs and OTs between 2009-2017. Case records of the patients that fit the histological classification of 2002 were involved in the study and the variables of age, gender, site and location were analysed. **Results:** In a total of 2156 biopsies, OCs accounted for 17.9%and OTs 3.4% of all lesions. Mean age occurrence was 34.5 yrs for OCs and 29.5 yrs for OTs. Males showed predilection by 56.29% for OCs and female predilection by 56.5% for OTs. The commonest OC was radicular cyst and tumor was ameloblastoma. **Conclusion:** This study provides epidemiological information on OCs and OTs at an institutional level. Prevalence and frequencies of these lesions can be studied at a global level to further obtain their prevalence, incidence, behaviour and distribution.

INTRODUCTION

Odontogenic cysts are distinctive lesions and comprise an important facet of oral and maxillofacial pathology derived from the odontogenic epithelium and its remnantswhich stay confined within the gingival tissue or bone.

Odontogenic tumors are procured from epithelial / ectomesenchymal elements of tooth forming apparatus and are relatively rare and destructive lesions of the jaws. Because of the multiplicity of the odontogenic tumors, various classifications have been revised in order to ascertain their diagnostic criteria and biological behaviour[1], [Table 1 and 2] The following tables depict the comparison of prevalence rate of OCs and OTs in different countries published in international literature [Table 3 and 4].

MATERIALS AND METHODS

A retrospective study was conducted where biopsy reports over an 8 year old period (2009-2017) were retrieved and catalogued from clinical records of department of oral pathology and microbiology. The OCs and OTs were assessed and the following variables were studied – age, gender, site and location. To classify the location of the cysts and tumors each jaw was divided into anterior, posterior, left and right zones.

RESULT

Among 2156 biopsy reports analysed from the year march 2009 to may 2017; 422 cases of cysts and 334 tumors were diagnosed out of which 135 were odontogenic cysts (31.9% of all cysts) and (17.9% of all the biopsies) reported; and 23 were odontogenic tumors (6.8% of all tumors) and (3.4%of all biopsies).

The patient's age ranged between (6-80 yrs) with a mean age of 34.5 [Table 5] for odontogenic cysts and between (7-65 yrs) with a mean age of 29.5 years [Table 6] for odontogenic tumors.

The gender distribution showed a slight male predilection (56.29%) in odontogenic cysts [Table 7] while odontogenic tumors showed a female predilection (56.5%). [Table 8]

Odontogenic cysts were more commonly involved in the mandible other than the radicular and residual cyst being more common in the maxilla while all the other cysts majorly detected in posterior mandible. The most common cyst being radicular cyst (48.8%) followed by OKC (25.9%) and dentigerous cyst (16.2%). [Table 9]

While the odontogenic tumors were mainly confined to posterior mandible than any other site. The most common being Ameloblastoma (69.5%) followed by Odontoma being the second commonest (17.3%). [Table 10]

TABLES AND GRAPHS

TABLE 1: WHO CLASSIFICATION OF ODONTOGENIC CYST (2005).

WHO CLASSIFICATION OF ODONTOGENIC CYSTS 2005	
EPITHELIAL	
DEVELOPMENTAL ORIGIN	**NON ODONTOGENIC**
ODONTOGENIC	nasolabial cyst
gingival cyst of new born	nasopalatine cyst
primordial cyst	
follicular cyst	**NON EPITHELIAL**
eruption cyst	traumatic bone cyst
lateral periodontal cyst	aneurysmal bone cyst
adult gingival cyst	stafne bone cyst
odontogenic glandular cyst	
INFLAMMATORY	
radicular cyst	
residual cyst	
paradentalcyst	

Table 2: WHO CLASSIFICATION OF ODONTOGENIC TUMOR (2005).

WHO CLASSIFICATION OF ODONTOGENIC TUMORS 2005
MALIGNANT TUMORS
ODONTOGENIC CARCINOMAS
metastatizing ameloblastoma
ameloblastic carcinoma -primary
ameloblastic carcinoma - secondary (dedifferentiated) intraosseous
ameloblastic carcinoma -secondary (dedifferentiated) periphery
primary intraosseous squamous cell carcinoma - solid type
primary intraosseous squamous cell carcinoma - derived from KCOT
primary intraosseous squamous cell carcinoma derived from Ocs
clear cell odontogenic carcinoma
ghost cell odontogenic carcinoma
ODONTOGENIC SARCOMAS
ameloblastic fibrosarcoma
ameloblastic fibrodentino/fibrodontosarcoma
BENIGN TUMORS
ODONTOGENIC EPITHELIUM WITHOUT ODONTOGENIC ECTOMESENCHYME
ameloblastoma solid,multicystic type
ameloblastoma extraosseous / peripheral type
ameloblastoma, desmoplastic type
ameloblastoma , unicystic type
squamous odontogenic tumor
calcifying epithelial odontogenic tumor
adenomatoid odontogenic tumor
keratocystic odontogenic tumor
ODONTOGENIC EPITHELIUM WITH ODONTOGENIC ECTOMESENCHYME
ameloblastic fibroma
ameloblastic fibrodentinoma
ameloblastic fibro odontoma
Odontoma
comlex type
compoud type
odontoameloblastoma
calcifying cystic odontogenic tumor
dentinigenic ghost cell tumor
MESENCHYME / OD. ECTOMESENCHYME WITH OR WITHOUT OD. EPITHELIUM
odontogenic fibroma
odontogenic myxoma / myxofibroma
cementoblastoma

TABLE 3: VARIOUS STUDIES OF ODONTOGENIC CYSTS.

AUTHOR	YEAR	M:F	DENT CYST	RAD CYST	OKC	MAXILLA	MAND
Fahneih baghaie	2014	0.63:1.57	27.20%	18.60%	18.60%	0	0
Natheer Hashim Al - rawi	2013	01:01.2	7.90%	69.10%	0	ant-23.2%,post-19.6%	42.70%
Saima Akram	2013	1.5:1	0	53%	0	0	0
Aydan Acikgoz	2012	1.1:1	26.30%	54.10%	3.20%	0	0
Deepashree . H . Kambalimath	2012	1.38:1	17.33%	48.67%	8%	0	0

TABLE 4: VARIOUS STUDIES OF ODONTOGENIC TUMORS.

AUTHOR	YEAR	M:F	AMELOBLASTOMA	ODONTOMA	AOT	MAX	MAND
Govindraj.K	2016	0.43:0.69	49.06%	6.20%	-	-	-
Fahimeh Baghaei	2014	0.63:1.57	64%		-	-	-
Rattapong Worawongvasu	2014	-	35%	15.20%	3.90%	-	-
Natheer Hashim Al- Rawi	2013	01:01.7	2.90%	12.20%	-	-	-
Saima Akram	2013	1.7:0.5	24.80%		-	-	-
B.S.M.S Siriwardena	2012	01:01	48.70%	10%	-	-	62.70%
Vijay Ebenezer	2010	01:01.6	14%	56%	-	-	71%
Hai-Yan Luo	2009	1.35:1	36.52%	6.11%	-	-	-

TABLE 5: AGE DISTRIBUTION OF ODONTOGENIC CYSTS.

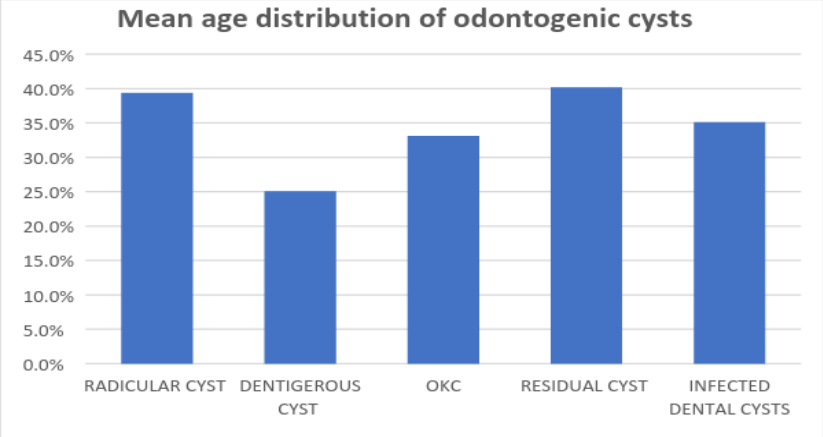


TABLE 6: AGE DISTRIBUTION OF ODONTOGENIC TUMORS.

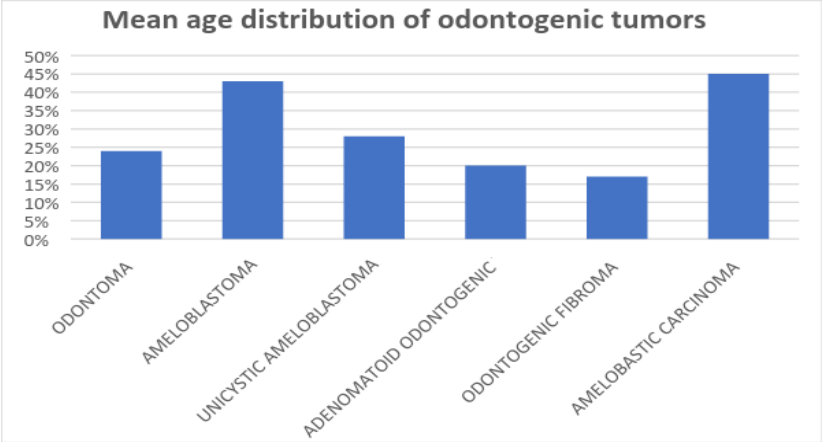


TABLE 7: FREQUENCY OF ODONTOGENIC CYSTS.

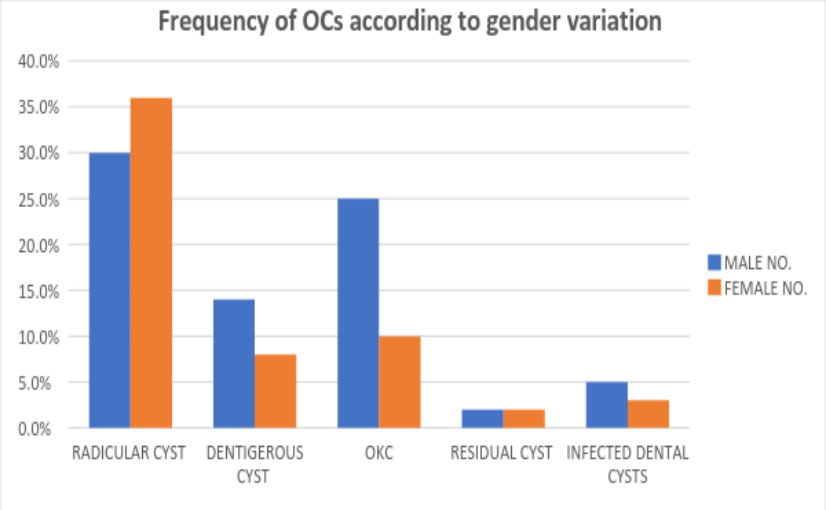


TABLE 8: FREQUENCY OF ODONTOGENIC TUMORS.

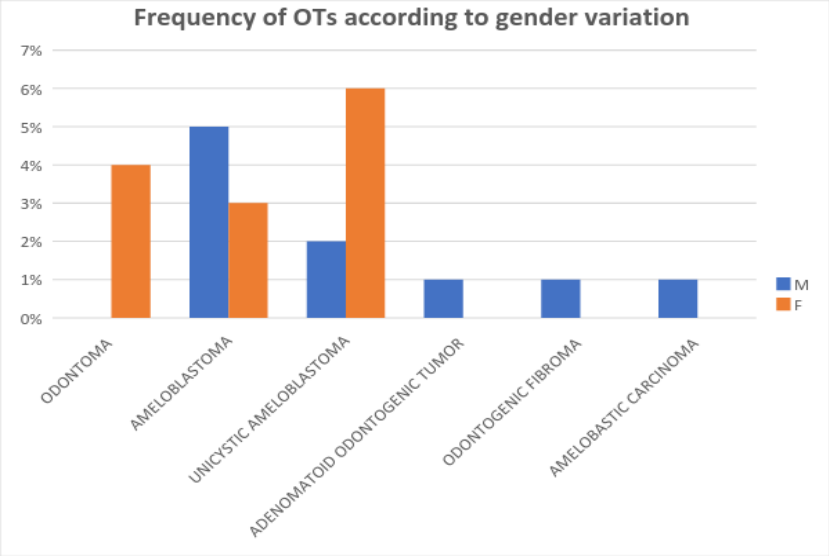


TABLE 9: SITE DISTRIBUTION OF ODONTOGENIC CYSTS.

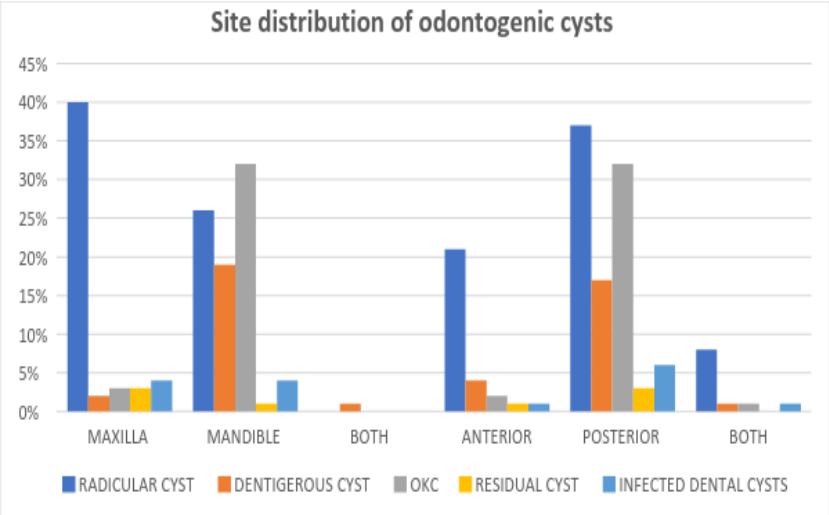
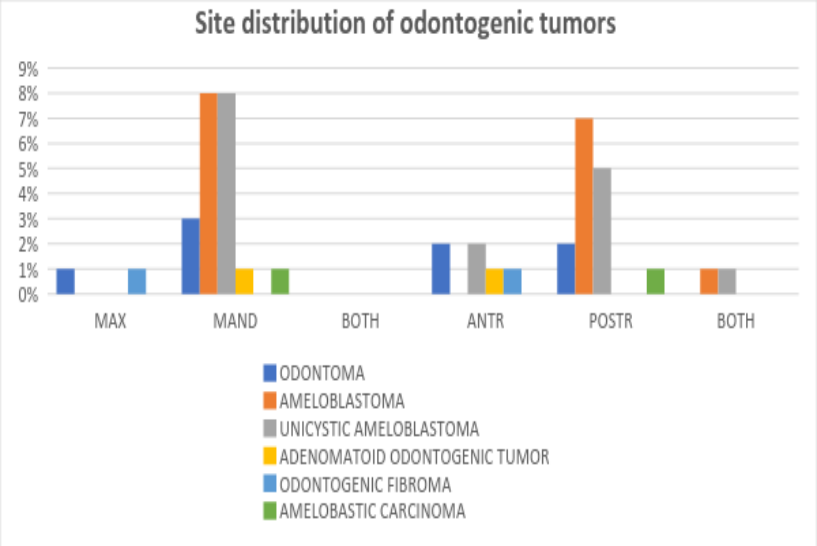


TABLE 10: SITE DISTRIBUTION OF ODONTOGENIC TUMORS.



DISCUSSION

Odontogenic cysts affecting the jaws have some similarity in the clinical and radiographic features therefore the diagnosis should be made on the basis of careful clinical examination and investigations.[2] On the other hand odontogenic tumours are usually rare and make up a diverse group of lesions derived from the odontogenic tissues. The first classification of this heterogenous group of lesions was published in 1971 which was then revised in 2002. Due to advances in molecular biology and immunochemistry the classification was modified by Philipsen and Reichart (2005).[3]

The present study aimed at providing epidemiological information of OCs and OTs at an institutional level. The total reported cases during the year 2009-2017 were taken from the department of oral pathology. The no. of cases reported were 2156 in the 8 year period out of which 422 cases of cysts and 334 tumors were reported which further comprised of 135 odontogenic cysts (17.9%) of all the lesions and 23 odontogenic tumors (3.4%) of all lesions. The incidence was similar to studies conducted in Iran (OC-16.9%, OT- 2.6%), Sri Lanka (OT-3.8%), India Bhopal (15.4% OC), Pakistan (OT-3.5%), and China (OT-2.4%).[2,3,4,5,6] Studies conducted in UAE and Thailand[4,6] showed higher incidence of odontogenic cysts and tumors.

The mean age for odontogenic cysts in the present study was 34.5 yrs and for odontogenic tumours was 29.5 yrs and results were in accordance to studies conducted in Thailand(34.6), Iran(OC-27.8,OT-23.9) UAE (OC-35) Sri Lanka (OC-30.6) Bhopal (India OC-33.2)[1,2,3,7]

whereas a study conducted in Andhra Pradesh, India revealed higher mean age values (OC-41.5 yrs, OT- 39.5 yrs).[8]

The present study showed a slight male predilection (56.29%) for odontogenic cysts. These values were similar to the studies conducted in Iran, Andhra Pradesh (OC-73% in males) UAE, (Bhopal) India (OC-58% in males).[2,4,7,8]

However the odontogenic tumors in our study showed a slight female predilection (56.5%) which were similar to studies conducted in Andhra Pradesh in 2014(OT- 39% in females)[8], Chennai (M:F=1.0:1.6).[9] On the flip side the studies conducted in Andhra Pradesh in 2016 (OT – 59%),[1] UAE[6], Karachi[5] showed a higher prevalence of the tumors in males.

The frequency of odontogenic cyst encountered in our study was highest for Radicular cyst (48.8%) followed by okc (25.9%), dentigerous cyst (16.2%) this was in agreement with studies conducted in UAE (RC-69.1%),[6] Karachi (OC-53%),[5] (Bhopal) India (RC-56.6%),[2] however differing results were published by the studies conducted in Iran[4] and Andhra Pradesh[8] with the commonest cyst for both being dentigerous cyst (27.2%, 68.4% respectively). In the present study, frequency of ameloblastoma amongst the OTs was highest (69.5%) followed by odontoma which accounted for 17.3% of all lesions. This result was consistent with other studies conducted in Andhra Pradesh[10], Thailand[1], Iran[4], Sri Lanka[3] whereas differing results were obtained from studies carried out in UAE (odontoma>ameloblastoma)[6], Karachi (KCOT >ameloblastoma)[5],Chennai (odontoma >ameloblastoma)[9], Chinese population (KCOT >Ameloblastoma).[10]

The most prevalent site for Radicular cyst in our study was anterior maxilla, on the contrary it was posterior mandible for rest of the cysts which coincided with results obtained from studies conducted in Iran[4], Bhopal.[2] On the contrary only Karachi[5] had greater prevalence of Radicular cyst in the mandible. The most prevalent site for Ameloblastoma in our study was posterior mandible which was coherent with studies conducted in Andhra Pradesh[10],Thailand[1], Iran[4], UAE[7], Karachi[5], Sri Lanka[3], Chennai[9], China.[6]

Malignant OTs was rare (4.3%), including only a single case of Ameloblastic carcinoma in the present study. Ameloblastic Carcinoma is a rare aggressive malignant epithelial odontogenic tumor of the maxillofacial skeleton with a distinct predilection in the mandible. Clinically these carcinomas are more aggressive than typical ameloblastomas. Perforation of

the cortical plate, extension into surrounding tissues, numerous recurrent lesions and metastasis, usually to cervical lymph nodes is associated with ameloblastic carcinomas. They usually reoccur 0.5-11 years after therapy. Distant metastasis is usually fatal and may appear as early as 4 months or as late as 12 years post operatively. The most common site for distant metastasis is the lung, bone, liver and brain.[11] According to various other studies, malignant odontogenic tumors were rare and represent 1.3%-5%[3] of all the tumors.

Adenomatoid odontogenic tumor (AOT) accounted for 4.3% of all tumors with its predilection at an early age of 20 years which was in accordance with previous studies conducted in Sri Lanka[3], China.[1]

This study provides epidemiological information on OC and OT at an institutional level. Retrospective analysis of the relative frequency of OCs and OTs across the globe will be of extreme help in understanding of these lesions which is valuable for both surgeons and pathologists.

CONCLUSION

It is noteworthy to take into account the few number of OCs and OTs in this study, further investigations are required to determine the relative frequency of both in Kancheepuram dist. Tamil Nadu.

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