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Oral and Maxillofacial Pathologies — An Institutional Study

Sam John Koshy, Madhulaxmi M*, Sivakumar

Department of Oral & Maxillofacial Surgery, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai - 600077, Tamil Nadu, India

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ABSTRACT

Oral and maxillofacial pathology infers all the diseases of the mouth and structures related to the mouth inclusive of salivary glands, temporomandibular joints (TMJ), facial muscles and perioral skin. Management of oral and maxillofacial pathology remains one of the most universally performed procedures by oral and maxillofacial surgeons. Lesions of the oral and maxillofacial region are a group of heterogeneous diseases with a wide spectrum of clinicopathologic characteristics. Predictability of lesions helps in rightly predicting, diagnosing, treating and eliminating pathologies that arise in the oral cavity. The aim of this study is to determine the frequency of oral and maxillofacial pathologies encountered in a single centre institution. This is a single centre retrospective study done from June 2019 – March 2020. Sixty-five patients who were diagnosed with a pathology pertaining to the oral and maxillofacial region were considered. Lesions were grouped as a cyst, tumors, infections, salivary gland pathologies and others for better understanding and interpretation. Out of a total of 65 patients considered with oral and maxillofacial pathological lesion requiring surgical management, the most common type of pathology was a cyst (40.0%) followed by tumors (21.5%). Gender predilection for oral and maxillofacial pathology was evident with greater incidence among males (63.1%) with p value = 0.049 < 0.05, by chi square test and in an age group of 21-30 years (30.8%) with p value = 0.044 < 0.05 by chi square test. This study concludes to establish the predominance of oral and maxillofacial pathologies that arise in the age group of 21-30 years with a gender preference to males over females. The most common pathology was cysts, followed by tumors with radicular cyst (53.8%) and ameloblastoma (35.7%) being most common in their respective pathological genre.

*Corresponding Author

Name: Madhulaxmi M
Phone: 7373814000
Email: madhulaxmi@saveetha.com

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INTRODUCTION

The word Pathology is derived from two Greek words 'patho' and 'logos' meaning 'suffering' and 'study' respectively. Together it stands for "study of disease". Pathology is the branch of science which studies the nature, cause and effect of a disease (Ha *et al.*, 2014). It deals with all aspects of a disease or condition, particularly on the nature, cause and development of certain abnormal conditions which leads to a functional and structural alteration in the well-being of an individual (Kumar *et al.*, 2013).

It is essential for understanding and identifying the frequency of disease patterns within popula-

tions to help aid in the differential diagnostic procedure leading to hastened treatment or management protocol and initiation of preventive measures (Jaafari-Ashkavandi *et al.*, 2013). This further helps enlighten the use of diagnostic histopathological and immunological aids to conclude the pathology effectively making it a universally valid element for rightful diagnosis (Christabel *et al.*, 2016; Jesudasan *et al.*, 2015; Kumar and Rahman, 2017). In literature, only limited number of studies illustrated the most commonly occurring oral and maxillofacial pathology in a general population and its correlation to variable factors such as age and gender. Till date, the institutional team of researchers has conducted several clinical trials (Marimuthu *et al.*, 2018; Packiri, 2017), in-vitro studies (Kumar, 2017a; Patil *et al.*, 2017) and awareness surveys (Rao and Kumar, 2018; Abhinav *et al.*, 2019a; Kumar and Sneha, 2016) in the field of Oral and Maxillofacial Surgery. Hence, a retrospective epidemiological setup is used for this study in order to highlight the differences in trends among the population (Patturaja and Pradeep, 2016; Abhinav *et al.*, 2019b; Jain *et al.*, 2019).

This study was conducted to determine the prevalence of various types of pathologies of the oral and maxillofacial region and their association with variables of age and gender who have undergone surgical management (Kumar *et al.*, 2015; Kumar, 2017b).

MATERIALS AND METHODS

Clinical records of all patients who attended the Department of Oral and Maxillofacial Surgery between June 2019 and March 2020 were screened. Among these, case records of patients who underwent treatment for maxillofacial pathology were segregated. A total of 89 cases were retrieved for this study. Biopsy and histopathological reports, along with clinical records, were comparatively evaluated in this study. Institutional ethical committee clearance was obtained for data retrieval and usage as needed for the study (SDC/SIHEC/2020/DIASDATA/0619-0320)

Case records of 89 patients were examined with photographic, radiological and histopathological cross verification of data for the elimination of errors which could've to arouse in the course of the study. Patients who underwent surgical management for a pathological lesion with reference to the availability of data of age, gender, availability of radiographs (IOPA/OPG, CT, MRI), biopsy and histopathological reports and followed up reviews were considered in the study. Inclusion of all available data with no sorting process has helped minimalized sampling bias and stating applicable validity to the study.

Data were collected from the patient information archives. Patient data with absence of histopathological reports, malignant pathologies and tooth-related localized infections like pericoronitis, dentoalveolar abscess and with absent follow up review notes were excluded from the study.

Out of a total of 89 patients considered for the study, 24 patients were excluded based on the exclusion criterion. A total of 65 patients were considered in this study. All pathological lesion were surgically managed with standard surgical protocols and treatment modalities. Data were collected and verified by an external examiner, and the statistical evaluation was done using IBM SPSS Version 20.

With the dependent variables being age and gender and Independent variable being the pathology, the statistical test of correlation 'chi-square' test was used to obtain the analysis of correlation and association in consideration. All results underwent statistical analysis at a confidence interval of 95%.

RESULTS AND DISCUSSION

Out of a total of 89 patients considered, 24 samples were excluded from the study as 12 patients did not have a histopathological report for evaluation, seven patients had a malignant lesion and five patients failed to turn up for post-operative follow-up and review. Out of the considered 65 samples of pathological lesion, they were further classified into four oral and maxillofacial categories of the cyst, tumors, infections, salivary gland pathologies and others.

According to age, 20 patients (30.8%) belonged to the age group of 21-30 years, 14 patients (21.5%) belonged to the age group of 31-40 years, nine patients(13.8%) in the age group of 11-20 years, and seven patients (10.8%) belong to the age group of 0-10 years [Figure 1].

In consideration of the gender, out of the total of 65 patients included in the study, 41 patients (63.1%) were male, whereas 24 patients (36.9%) were female [Figure 2].

According to the pathology considered, 26 patients (40.0%) were cysts in nature out of which 15 patients (57.7%) had a radicular cyst and six patients (23.1%) had Odontogenic keratocyst (OKC). Fourteen patients (21.5%) had tumor of the oral and maxillofacial region, of which five patients (35.7%) had ameloblastoma and three patients (21.4%) had odontoma. Twelve patients (18.5%) had infections, of which six patients (50%) had

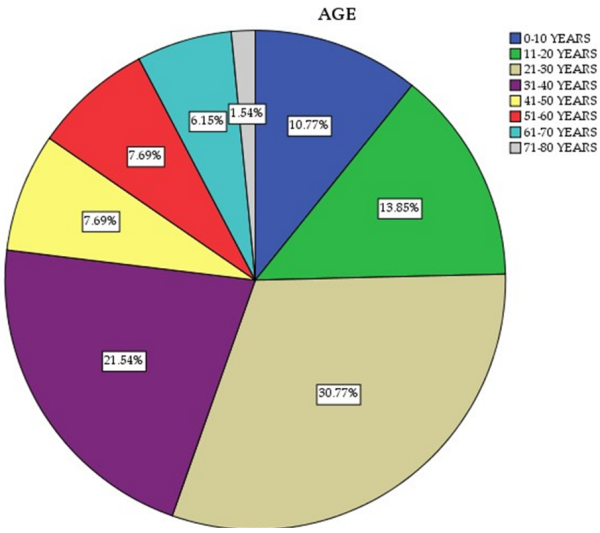

Figure 1: Piechart showing the percentage of incidence of Oral and Maxillofacial Pathology based on different age groups.

periapical granuloma and two patients (16.7%) had space infections. Eight patients (12.3%) had salivary gland pathologies out of which five patients (62.5%) had mucous extravasation cyst and two patients (25.0%) had pleomorphic adenoma. Five patients (7.7%) were categorized with other forms of pathologies out of which three patients (60.0%) had oral submucous fibrosis [Figure 3].

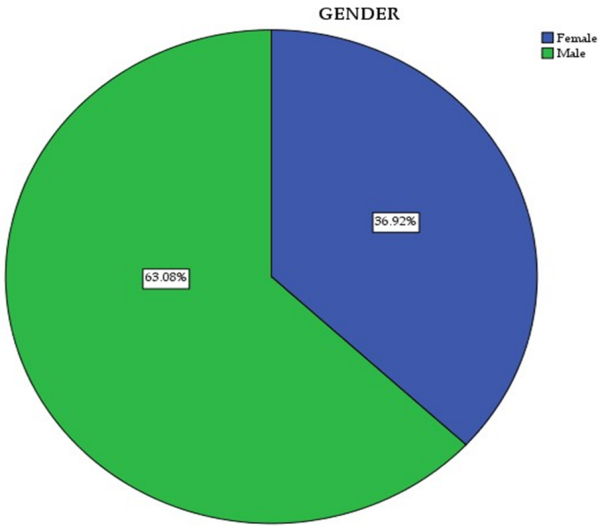

Figure 2: Piechart showing the percentage of incidence of Oral and Maxillofacial Pathology based on the gender of the patient.

The association of various types of pathologies with age revealed the predominance of cysts among the age group of 31-40 years (26.9%). 42.9% of tumors and 58.3% of infections of the oral and maxillofacial region were seen in the age group of 21-30 years. However, 50.0% of salivary gland pathologies were seen in the age group of 0-10 years and 40.0% of other pathologies were evident in the age group of 41-50 years. Most pathologies were seen in the age group 21 - 30 years and were statistically significant, p value = 0.044 < 0.05 by chi square test [Figure 4].

On the association of oral and maxillofacial pathologies with gender, there was male predilection in cyst (53.8%), tumors (85.7%) and infections (83.3%) of the region. However, female patients have shown a higher rate of predilection in pathologies of the salivary gland (62.5%) and other lesion (60.0%) of the oral and maxillofacial region. There was the statistically significant predilection of occurrence of maxillofacial pathologies in males with p value = 0.049 < 0.05, by chi square test [Figure 5].

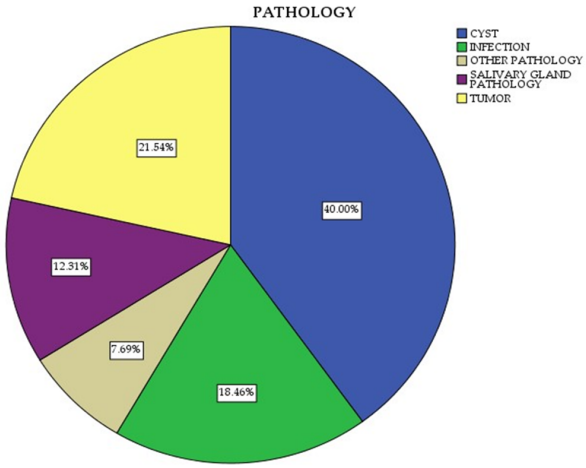

Figure 3: Piechart showing the percentage of incidence of various types of oral and maxillofacial pathologies.

Oral and maxillofacial pathology confines the study of nature of the disease, its cause, processes, development and consequences (Bhaskar, 1968). In this present study, pathologies of the oral and maxillofacial region have proved to be confined more to an age group of 21-30 years. Many studies have proved to be in agreement with the results obtained (Ha *et al.*, 2014). Other studies have obtained variable results. Jones and Franklin et al. have stated the most prevalent age of pathology in the oral and maxillofacial region to be 41-50 years (Jones and Franklin, 2006). Weir et al. in his study has stated the mean age group for the development of pathologies to be of the sixth decade (61-70 years) (Weir *et al.*, 1987).

Studies have probed to undermine the reason for the male predilection of oral and maxillofacial pathologies over females. Deleterious habits, negligence and lack of oral hygiene are the most sought out reasons for male predilection over female for pathologies (Ha *et al.*, 2014; Kreidler *et al.*, 1993). This study has proven to have a higher male predilection over female for oral and maxillofacial pathologies.

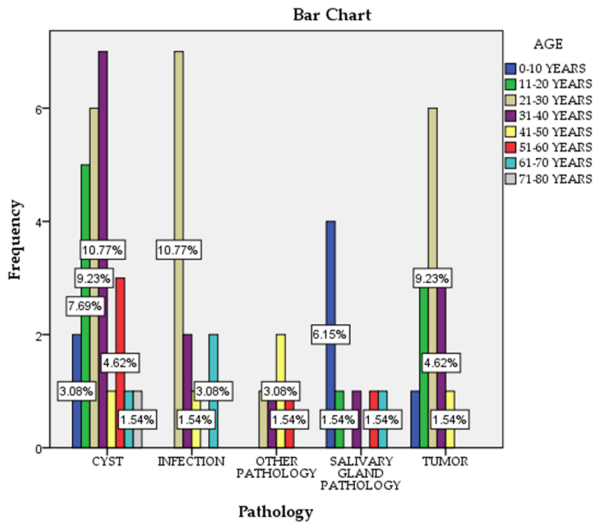

Figure 4: Bar graph showing association between age and Type of Pathology.

Many studies are dyssynchronous with this finding proving to have a higher female predilection over males (Weir *et al.*, 1987; Ha *et al.*, 2014; Ameri *et al.*, 2014; Bhaskar, 1968).

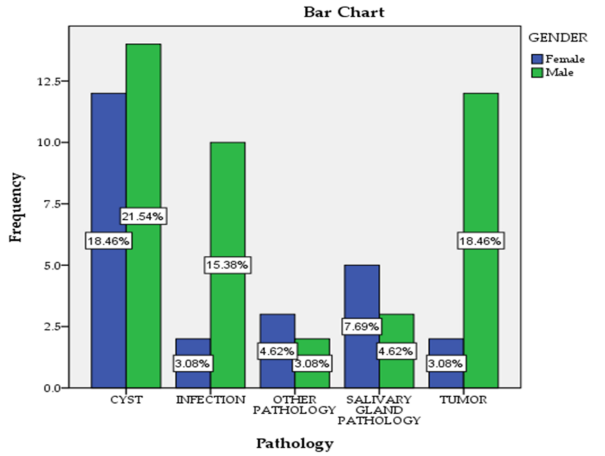

Figure 5: Bar graph showing association between Gender and Type of Pathology.

Pathologies of the oral and maxillofacial region are classified by many authors based on feasibility of understanding and clinicopathological examination of the lesion (Santosh *et al.*, 2015; Biswas *et al.*, 2019). This study has proven to show an increased frequency of cysts, tumors, infections, salivary gland pathologies and other pathologies pertaining to the region of oral and maxillofacial (Ha *et al.*, 2014; Biswas *et al.*, 2019; Jaafari-Ashkavandi *et al.*, 2013). Many studies have also stated the increased frequency of incidence of oral cysts when compared to other pathological lesion (Jones and Franklin, 2006; Kamulegeya and Lakor, 2011). However, Cavalcante et al. have proven the increased rate of incidence for salivary gland pathologies over other forms of pathologies (Philipone and Yoon, 2017). Weir et al. and Bhaskar et al. have enlightened the vast supremacy of infections pertaining to the oral and maxillofacial region to have a greater incidence (Bhaskar, 1968; Weir *et al.*, 1987).

The most prevalent incidence of oral and maxillofacial pathology among cyst, tumors, infections, salivary gland pathologies and other pathologies include Radicular cyst, Ameloblastoma, Periapical granuloma, Mucous extravasation cyst and Oral submucous fibrosis respectively. Many studies have shown its results to be in sync with our findings (Kamulegeya and Lakor, 2011; Ha *et al.*, 2014; Jain *et al.*, 2019).

A survey of Brisbane based on the general and specialist dentists and oral and maxillofacial surgeons found that many don't perform a routine biopsy procedure. Out of those who do, the majority of the tissue specimens were not submitted for histopathological assessment (Cawson and Odell, 2008). In other populations, these diagnostic groups may also be under-represented due to the limited accessibility of histopathology services (Buchner *et al.*, 2006). Alternatively, the management and treatment of some pathology may result in the loss of tissue specimen for histopathological submission. These unresolved problems do hinder in the rightful completion and interpretation about the oral and maxillofacial pathologies.

Figure 1, Patients within age group 21-30years showed the highest incidence rate (30.77%) (represented by Cream color)

Figure 2, The incidence in males (represented by green colour) were more than half of the study population (63.08%)

Figure 3, Most common pathology was cyst 40%(Blue) and least were salivary gland (purple)(12.3%) and other pathologies (7.69%)(Cream)

Figure 4, The X-axis denotes the pathology in different age groups of patients; Y-axis denotes the frequency of pathological lesions; Majority of the cysts occured in the age group of 31-40 years (violet) (10.77%). Majority of the infections and maxillofacial tumors occurred in the age group of 21-30 years (cream) (10.77% and 9.23% respectively). Other pathologies, including OSMF and osteoradionecrosis, occurred in the age group of 41- 50 years of age (yellow) (3.08%). Salivary gland pathologies were most prevalent in the age group of 0-10 years (blue) (6.15%). The association was statistically significant (Chi square test, p value- 0.044 < 0.05- statis-

tically significant)

Figure 5, (X-axis denotes the pathology in different gender of patients, and Y-axis denotes the frequency of pathological lesions; Among males(green) the most frequent pathology was a cyst (21.54%) followed by tumors of maxillofacial region (18.46%), infections (15.38%), salivary gland pathologies (4.62) and other pathologies (3.08%). Among females (blue), the most frequent pathology seen was the cyst (18.46%) followed by pathologies of the salivary gland (7.69%), other pathologies including OSMF and osteoradionecrosis (4.62%), infections and tumors (3.08%). Most pathologies were predominantly seen in males and are statistically significant. (Chi square test, p value = 0.049 < 0.05, statistically significant).

Accurate diagnosis of pathologic lesions of the oral and maxillofacial region is crucial as various types are aggressive and may lead to local recurrence if incorrectly diagnosed and inappropriately treated (Bhaskar, 1968; Weir *et al.*, 1987; Jones and Franklin, 2006). Predictability of lesions helps in rightly predicting, diagnosing, treating and eliminating pathologies that arise in the oral cavity.

CONCLUSION

This study concludes to establish the predominance of oral and maxillofacial pathologies that arise in the age group of 21-30 years with a gender preference to males over females. The most common pathology was cysts, followed by tumors with radicular cyst (53.8%) and ameloblastoma (35.7%) being most common in their respective pathological genre.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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