

# PREVALENCE OF SALIVARY GLAND DISEASE IN PATIENTS VISITING A PRIVATE DENTAL COLLEGE

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## ABSTRACT:

The aim of the study was to estimate the prevalence of salivary gland diseases in patients visiting a private dental college. A retrospective analysis was conducted on patients who visited the Department of Oral Medicine from March 2019 to March 2020. Clinically diagnosed cases of salivary gland diseases which included salivary gland neoplasms, xerostomia, necrotizing sialometaplasia, mucocele, ranula, sjogren's syndrome, sialodochitis, sialadenitis were included in the study. The details of each case were reviewed from an electronic database. From the study we found that 17 patients were diagnosed with salivary gland disease. The most commonly observed salivary gland disease was mucocele of the lip with a frequency of 41.17% in the study population followed by xerostomia (17.65%). Salivary gland disease can occur due to variable causes and might significantly affect the quality of life and daily functioning. Only with a thorough knowledge of the subject it is possible to detect the diseases of the salivary gland in their early stage and manage them more efficiently.

**KEYWORDS:** Mucocele, Necrotizing sialometaplasia, Ranula, Salivary gland disease, Xerostomia.

## INTRODUCTION:

Saliva is a complex combination of fluids, electrolytes, enzymes and macromolecules that contribute to several important functions combined together (Venugopal and Uma Maheswari, 2016; Maheswari *et al.*, 2018). Salivary functions include lubrication to help swallowing, producing amylase enzymes to help in digestion, taste modulation, protection against caries, pathogens and enabling communication through speech (de Almeida *et al.*, 2008; Malathi, Mythili and Vasanthi, 2014; Wilson, Meier and Ward, 2014). Without adequate salivary output, the oro-pharyngeal health declines along with a person's quality of life. The major salivary glands are the paired parotid, submandibular and sublingual glands and there are several hundred minor salivary glands distributed throughout the oral cavity (Riva, 2010; Glick, 2015).

The complaint of a dry mouth and the objective finding of a salivary gland dysfunction are common occurrences in older individuals, producing transient and permanent oral and systemic problems. Salivary gland dysfunction however is not a normal sequence of growing older and can occur due to systemic diseases, medications and head and neck radiotherapy.

Diagnosis of salivary gland disorders begins with a careful medical history, head and neck examination(Steele *et al.*, 2015).While complaints of dryness of the mouth or swelling may indicate a salivary gland disorder,sometimes salivary gland diseases may also present without any symptoms.Patient may also complain of sore throat,bad breath,difficulty in chewing,swallowing and talking.The oral hygiene in these patients might be compromised.Salivary gland hypofunction and xerostomia are associated with increased development of dental caries(Rohini and Kumar, 2017).Hence a proper maintenance of oral hygiene is essential in these patient.(Dharman and Muthukrishnan, 2016; Subashri and Maheshwari, 2016).

A routine examination of salivary gland function must be a part of head,neck and oral examination.Health care professionals play an important role in recognising patients who are at risk for developing salivary gland diseases and should provide appropriate preventive and interventive techniques to help preserve a patient's health,function and quality of life(Ship, 2002; Muthukrishnan and Bijai Kumar, 2017; Muthukrishnan and Warnakulasuriya, 2018).(Muthukrishnan, Bijai Kumar and Ramalingam, 2016)

Salivary gland diseases can be broadly classified as neoplastic (benign and malignant), infectious and noninfectious which should be considered in the diagnostic process of examining a patient with salivary gland dysfunction(Norman and Mitchell, 1998).

Most salivary gland tumours are benign.The majority of benign salivary gland neoplasms occur within parotid gland, with preponderance of pleomorphic adenomas(Martin, Salmaso and Onnis, 1989; Nagler and Laufer, 1997)(Choudhury *et al.*, 2015).Malignant salivary gland tumour incidence increases with age and they are more commonly seen in the submandibular and sublingual glands.These patients may present with symptoms such as swelling,pain,numbness over the region of salivary gland(Subha and Arvind, 2019).Mucoepidermoid carcinoma is the most common malignant salivary gland tumors followed by the adenoid cystic carcinoma, acinic cell carcinoma, adenocarcinoma,squamous cell carcinoma and carcinoma arising in a pleomorphic adenoma(Lopes *et al.*, 1999) (Misra *et al.*, 2015).

Bacterial infections are predominantly seen in older persons who experience salivary hypofunction secondary to medications,head and neck radiation,systemic diseases or dehydration(Almståhl and Wikström, 1999).Viral infection of salivary glands occurs in patients of all ages, but specifically seen in immunocompromised patients,predominantly affecting the parotid glands.Mumps caused by paramyxovirus is a commonly seen viral infection in children which presents as bilateral parotid gland swellings. Cytomegalovirus infection is observed primarily in adults and tends to be mild with non specific findings.

Acute parotitis was commonly seen before the antibiotic era in the terminally ill and dehydrated patients,but now it is not frequently seen.Chronic parotitis is common and occurs following obstruction of a major salivary gland duct with subsequent bacterial colonization and infection(August *et al.*, 1996).

Non infectious (reactive) causes of salivary gland diseases are most common because of obstruction of a salivary gland excretory duct. It can be divided into acute and chronic conditions. Acute sialadenitis usually results from an immediate partial or complete ductal obstruction whereas chronic recurrent sialadenitis occur as a result of prior infection and/or ductal scarring(Williams, Connor and Edmondson, 2000).

Mucoceles are the most common reactive lesions occurring in the lower lip which are caused due to local trauma.When a minor salivary gland duct is severed,mucin leaks into the surrounding connective tissue, resulting in a smooth surfaced painless swelling. Mucous cyst of the sublingual and submandibular glands are referred to as ranulas(Anastassov *et al.*, 2000).

Salivary gland swellings may also be caused due to calculi, which are calcifications of mucous plug and cellular debris resulting from dehydration and glandular inactivity. Salivary calculi are most frequently seen in submandibular gland ducts systems.

Salivary dysfunction may also be seen due to any underlying systemic conditions. A wide range of diseases may affect the salivary gland functions which includes alzheimer's disease, parkinson's disease, HIV/AID,sarcoidosis,sjogren's syndrome,stroke, rheumatoid arthritis,scleroderma, lupus, cystic fibrosis, diabetes, dehydrations, head and neck radiotherapy and chemotherapy.

Considering the varied presentation of salivary gland disease the objective of our study was to estimate the prevalence of salivary gland diseases in patients visiting a private dental college.

## **MATERIALS & METHODS:**

A retrospective study among patients who visited the Department of Oral Medicine in a private dental college during the period of March 2019 to March 2020 was conducted.A primary researcher and reviewer were involved in this retrospective study.Clinically diagnosed cases of salivary gland disease which included salivary gland neoplasms, xerostomia, necrotizing sialometaplasia, mucocele,ranula, sjogren's syndrome,sialodochitis, sialadenitis were included in the study.Data was reviewed from an electronic database.Case sheets were cross verified based on clinical diagnosis,lab reports and histopathological diagnosis. The reviewed data was tabulated in SPSS software.The data included information on age,sex,the chief complaint of the patient,clinical diagnosis,investigations done and the management undergone by the patients for salivary gland disease.Descriptive analysis (frequency and percentages) were used for statistical analysis.

## **RESULTS & DISCUSSION:**

In this retrospective study 17 patients who were diagnosed with salivary gland disorders were reviewed and included in the study.

The frequency distribution of age of the patients who were diagnosed with salivary gland disease included 5-15 years(11.76%),15-25 years(23.53%), 25-35 years(11.76%),35-45 years(11.76%),45-55 years(5.88%),55-65 years(29.41%) and 65-75 years(5.88%)(graph 1).

The frequency distribution of sex showed slightly higher male presenetation(52.94%) than females(47.06%)(graph 2).

In our study the chief complaint present in maximum patients were swelling in the lower lip(35.29%),followed by dryness of the mouth(17.65%) and swelling below the tongue(11.76%)(graph 3).

In our study the maximum patients presented with no relevant medical history (70.59%) followed by diabetes(11.76%) and cancer treatment(5.88%),joint stiffness(5.88%)(graph 4).

The frequency distribution of clinical diagnosis included mucocele in lower lip(35.29%), xerostomia (17.65%), bacterial sialadenitis (11.76%), necrotising sialometaplasia (11.76%), mucocele in upper lip (5.9%), ranula (5.88%), sjogren's syndrome(5.88%) and sialodochitis (5.88%)(graph 5).

The frequency distribution of the investigations undergone by the patients included biopsy (52.94%),sialometry(17.65%)(graph 6).Excisional biopsy(47.06%) was the most commonly undergone management followed by topical wet mouth rinse(23.53%),antibiotic therapy(17.65%) and topical steroid therapy (11.76%) in patients who were diagnosed with salivary gland disease(graph 7).

Salivary glands are one of the main soft tissue structures seen in the maxillofacial region which are complex in nature. These glands may be tubuloacinar, merocrine or exocrine glands secreting mainly saliva. Salivary glands may be affected by a number of diseases due to local and obstenic causes. The

prevalence of salivary gland disease depends upon various etiological factors. The glands may be affected by viral, bacterial infection or obstruction of the ductal system which may cause painful swelling and affect salivary functions. The salivary glands may also be affected by various benign and malignant tumours (Patil *et al.*, 2018).

Based on the present study, the most commonly present salivary gland disease was mucocele in the lower lip (35.29%) followed by xerostomia (17.65%) in the study population.

Mucocele was most commonly seen in younger age groups with frequency distribution of 5-15 years (37.50%) and 15-25 years (37.50%) (graph 8). Excisional biopsy was the most commonly undergone treatment by these patients. The study findings were supported by the study done by More *et al.*, which found that oral mucoceles were frequently seen in oral medicine service, mainly affecting young people with predominant occurrence in lower lip (More *et al.*, 2014).

Xerostomia was the second most commonly observed salivary gland disorder in our study. It was predominantly seen in the older age group with frequency distribution of 33.33% in 45-55 years, 33.33% in 55-65 years and 33.33% in 65-75 years. The commonly observed underlying cause for xerostomia was due to diabetes and history of chemotherapy and radiotherapy in these patients. The study finding was concurrent to a study done by Liu *et al.* in 2012, which found there was high prevalence of xerostomia and salivary gland hypofunction in vulnerable elders. The common aetiology included medications, poor general health, female gender and age (Liu *et al.*, 2012). Recent evidence suggests that radiotherapy induced xerostomia can be limited to a certain extent by short term supplementation with antioxidants vitamin E and C (Chaitanya *et al.*, 2018) (Chaitanya *et al.*, 2017). Sialometry was the most frequently employed investigation in these patients and therapy with topical wet mouth rinse was the most preferred type of medical management in these patients.

Necrotizing sialometaplasia was seen in 11.76% of the study population. Necrotizing sialometaplasia is a benign self-limiting inflammatory reaction which commonly affects the minor salivary glands. It often mimics oral squamous cell carcinoma or mucoepidermoid carcinoma, both clinically and histologically, creating a diagnostic dilemma leading to unwarranted aggressive surgery. The most commonly affected site is the minor salivary glands of the palate, but could also be seen in other sites like retromolar pad, gingiva, lip, tongue and buccal mucosa.

On evaluating the association between salivary gland disease and age it was found that mucocele in the lower lip was seen the most in the age group of 5-15 and 15-25 years. Xerostomia was seen the most in age group 45-55, 55-65 and 65-75 years. Chi-square test was done to see the association between salivary gland disease and age. There was statistically no significant association between salivary gland disease and age (p value >0.05) (graph 9).

On evaluating the association between salivary gland disease and sex it was found that necrotizing sialometaplasia was seen only in males and ranula, Sjogren's syndrome, sialodochitis were seen only in females. Mucocele of the lower lip was seen equally in both males and females while, mucocele of the upper lip was seen only in males. Chi-square test was done and there was statistically no significant association found between salivary gland disease and sex (p value >0.05) (graph 10).

In our study the most commonly affected site was lateral border of tongue. In a study conducted by Joshi *et al.* it was found that palatal minor salivary glands were the most commonly affected site. This finding contradicts our study finding, as the lateral border of tongue was the most commonly seen affected site (Joshi *et al.*, 2014). Topical corticosteroid therapy was the most commonly prescribed medication in these patients.

The limitations of the present study were small sample size availability, retrospective study with lesser number of follow-ups available. The findings of our study cannot be generalized. A prospective study with adequate number of follow-ups with clinical, laboratorial and histopathological diagnostic correlation can be done.

### **CONCLUSION:**

In our study the most prevalent salivary gland disease was mucocele of lips (41.17%), followed by xerostomia (17.65%) and necrotising sialometaplasia (11.76%). Salivary gland disease can occur due to variable causes and might significantly affect the quality of life and daily functioning. Only with a thorough knowledge of the subject it is possible to detect the diseases of the salivary gland in their early stage and manage them more efficiently.

### **AUTHORS CONTRIBUTION:**

Dr.J.Abarna contributed in the research design, collection and interpretation of data, drafting the manuscript.

Dr.G.Maragathavalli contributed in the conception, data analysis, data interpretation and critically revising the manuscript.

Dr.Manjari has contributed to the final drafting of the manuscript.

### **CONFLICT OF INTEREST:**

Nil

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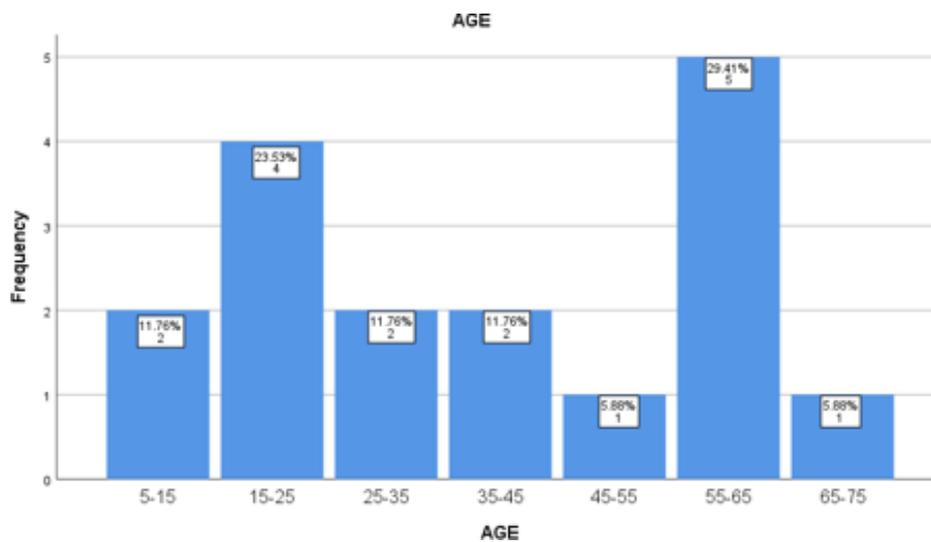
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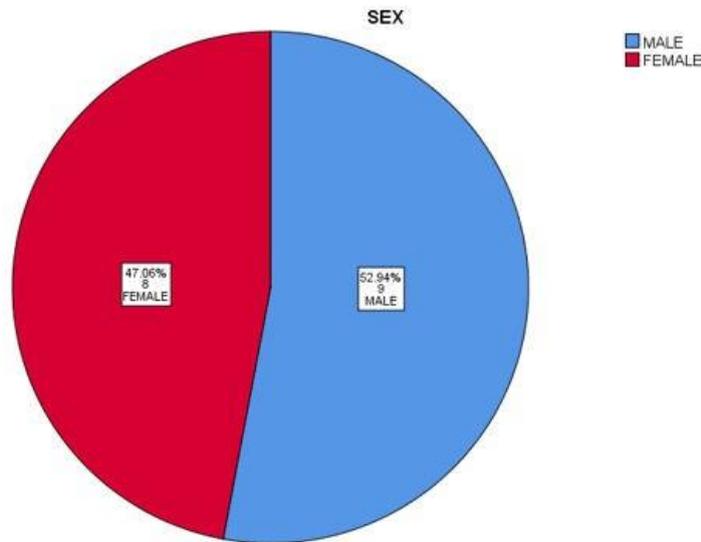
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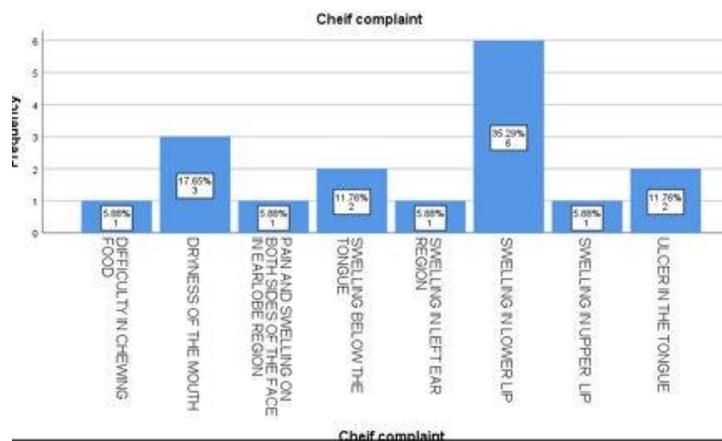
## GRAPHS:



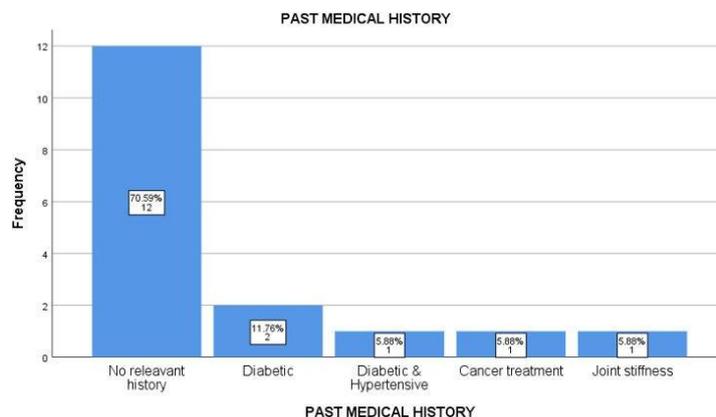
Graph-1: This graph shows age distribution of the study population where X axis denotes age in years and Y axis denotes frequency in numbers. In our study the maximum patients belonged to the age group of 55-65 years(29.41%).Chi-square test was done and there was statistically no significant association between salivary gland disease and age. Pearson chi square=40.375 p value=0.542( >0.05).



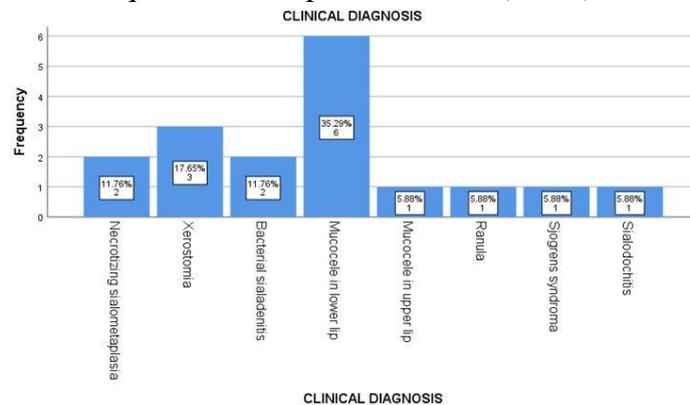
Graph-2: This pie-chart shows sex distribution of the study population, where blue colour denotes male and red colour denotes female. In our study 9 patients (52.9%) were males and 8 patients were females (47.06%). Chi-square test was done and there was statistically no significant association between salivary gland disease and sex. Pearson chi square=6.296 p value=0.506 (>0.05).



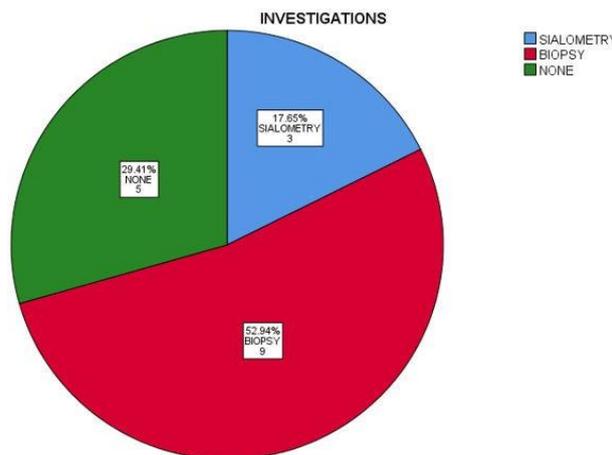
Graph-3: This graph shows the chief complaint present in the study population, where X axis represents chief complaint present and Y axis represents frequency in numbers. In our study the maximum patients presented with a chief complaint of swelling in the lower lip (35.29%), followed by dryness of the mouth (17.65%), swelling below the tongue (11.76%) and ulcer in the tongue (11.76%). Chi-square test was done and there was statistically significant association between salivary gland disease and chief complaint presentation in our study. Pearson chi square=86.889 p value=0.001 (<0.05).



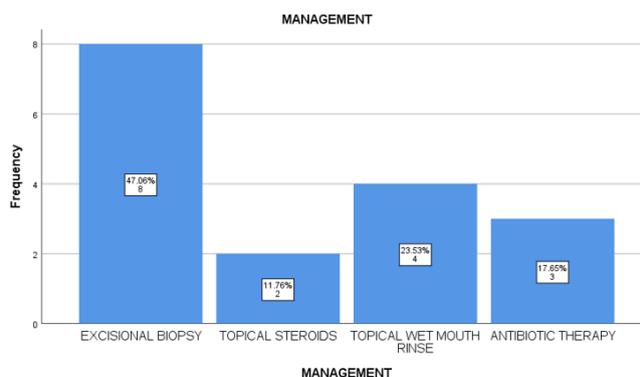
Graph-4: This graph shows the past medical history in the study population, where X axis represents the past medical history and Y axis represents frequency in numbers. In our study the maximum patients presented with no relevant medical history (70.59%). Chi-square test was done and there was statistically significant association between salivary gland disease and past medical history in our study. Pearson chi square=41.792 p value=0.045 (<0.05).



Graph-5: This graph shows the clinical diagnosis of the study population, where X axis represents the clinical diagnosis and Y axis represents frequency in numbers. In our study the maximum patients were diagnosed with mucocele in the lower lip (35.29%) followed by xerostomia (17.65%).

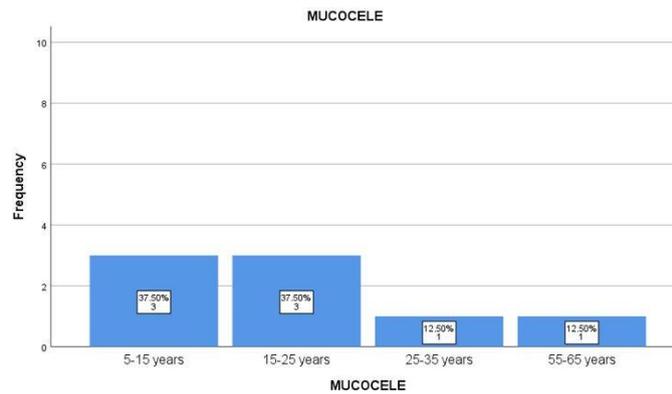


Graph-6: This pie-chart shows the investigations done for salivary gland disease in the study population, where red colour denotes biopsy, blue colour denotes sialometry and green colour denotes none. In our study the most done investigation was biopsy (52.94%) followed by sialometry (17.56%). Chi-square test was done and there was statistically significant association between salivary gland disease and investigations done in our study. Pearson chi square=34.000 p value=0.002 (<0.05).

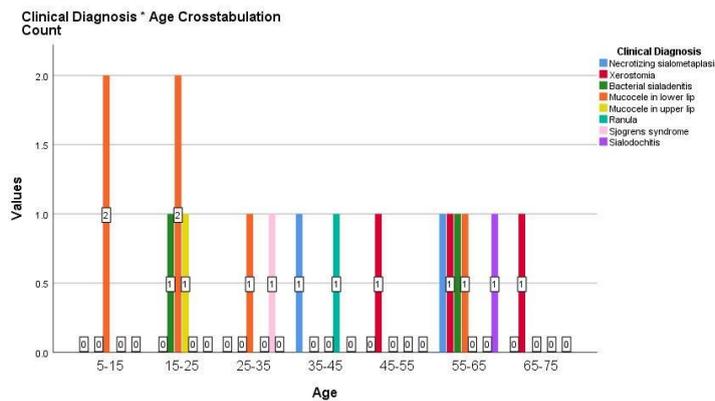


Graph-7: This graph shows the management undergone for the salivary gland disease in study population, where X axis represents the management and Y axis represents frequency in numbers. In our study the maximum patients underwent excisional biopsy (47.06%) followed by therapy with topical wet mouth rinse (23.53%), antibiotic therapy (17.56%). Chi-square test was done and there was statistically

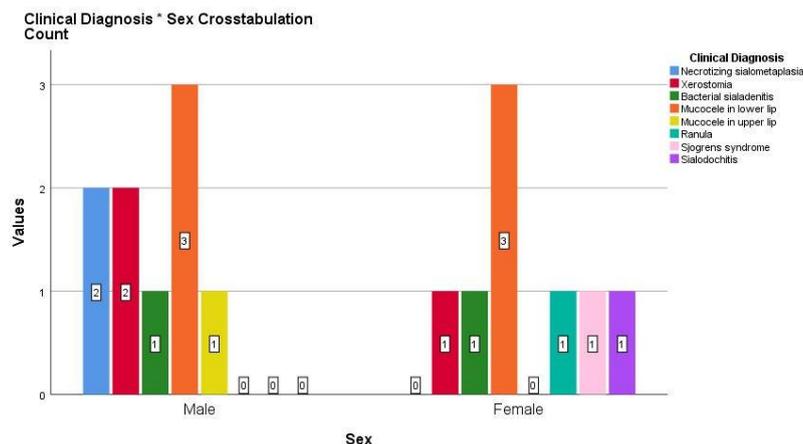
significant association between salivary gland disease and management in our study. Pearson chi square=51.000 p value=0.000( <0.05).



Graph-8: This graph shows the presentation of mucocele in different age groups, where X axis denotes the age in years and Y axis denotes the frequency in number. In our study mucocele was reported more in the age groups 5-15 years(37.50%) and 15-25 years(37.50%). Chi-square test was done and there was statistically no significant association between mucocele and age in our study. Pearson chi square=1.556 p value=0.670( <0.05).



Graph-9: This graph represents the association of salivary gland disease and age, where blue colour denotes necrotising sialometaplasia, red colour denotes xerostomia, green colour denotes bacterial sialadenitis, orange colour denotes mucocele in lower lip, yellow colour denotes mucocele in upper lip, blue colour denotes ranula, pink colour denotes sjogren's syndrome and violet colour denotes sialodochitis. X axis denotes age in number and Y axis denotes frequency in number. Graph shows that the mucocele in the lower lip was seen the most in the age group of 5-15 and 15-25 years. Xerostomia was seen the most in age group 45-55, 55-65 and 65-75 years. Chi-square test was done and there was statistically no significant association between salivary gland disease and age. Pearson chi square=40.375 p value=0.542( >0.05).



Graph-10: This graph represents the association of salivary gland disease and sex, where blue colour denotes necrotising sialometaplasia, red colour denotes xerostomia, green colour denotes bacterial sialadenitis, orange colour denotes mucocele in lower lip, yellow colour denotes mucocele in upper lip, blue colour denotes ranula, pink colour denotes sjogren's syndrome and violet colour denotes sialodochitis. X axis denotes age in number and Y axis denotes frequency in number. Graph shows that necrotising sialometaplasia was seen only in males and ranula, sjogren's syndrome, sialodochitis were seen only in females respectively. Mucocele of lower lip was seen equally in both males and females, while mucocele of upper lip was seen only in males in our study. Chi-square test was done and there was statistically no significant association between salivary gland disease and sex. Pearson chi square=6.296 p value=0.506 (>0.05).