ADDIS ABEBA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

DEPARTMENT OF ORAL AND MAXILOFACIAL SURGERY

PREVALENCE AND PATTERN OF JAW CYSTS AMONG PATIENTS WHO VISITED MAXILLOFACIAL SURGERY DEPARTMENT FROM JANUARY 2018 TO JANUARY 2020, RETROSPECTIVE ANALYSIS.

RESEARCH PAPER TO BE SUBMITTED TO DEPARTMENT OF DENTISTRY, SCHOOL OF MEDICINE, COLLEGE OF HEALTH SCIENCES, ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SPECIALTY CERTIFICATE IN ORAL & MAXILLOFACIAL SURGERY.

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DECLARATION OF WORK

I hereby declare that this report is entirely my own work and appropriate credit has been given to the references of the work of others.

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LIST OF ABBREVIATIONS

CHS-College of Health Science

OPD-Out Patient Department

AAU-Addis Ababa University

WHO- world Health Organization

A.A-Addis Ababa

OC- Odontogenic cyst

NOC-Nonodontogenic cyst

TASH-Tikur Anbesa Specialized Hospital

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ABSTRACT

Background:

Cysts are pathologic cavity within the hard and soft tissue which may contain fluid, semi fluid or gaseous material either lined by an epithelium, fibrous tissue or neoplastic tissue involving the bone and soft tissue. It occurs more in the jaw bones commonly due to the presence of numerous rests of odontogenic epithelium that remain after tooth development (1). Epithelial intraoseaous cysts can either be odontogenic or nonodontogenic. Odontogenic cysts are cysts that arise from tooth germ apparatus. Nonodontogenic cysts are cysts that arise from the epithelial remnants of embryonic structures(2). Depending on the type of cystic lesion whether odontogenic or nonodontogenic their distribution seems to vary according to different age groups as well as sex distributions(8,9). Some even seem to show preference to specific anatomic sites and demographics differences (2,11).

Methodology: Cross sectional retrospective study were conducted on patients report cards from patients who visited the oral and maxillo facial surgery outpatient department(OPD) in both black lion hospital & dental center at Addiss Abeba University college of health science, whom were registered from January 2018 up to January 2020. All the data from the charts with a diagnosis of odontogenic and nonodontogenic cysts who fulfilled the criteria were used in the study. Data's regarding demography, duration, cystic type, anatomic location and specific cystic diagnosed and intervention were reviewed from the chart.

Result: From a total of 70 cases 59(84.3%) were Odontogenic cyst and 11(15.7%) were non odontogenic, in which 38(54.3%) were females and 32(45.7%) were males, with a female to male ration off 1.19.The mean and median ages were 30.01 and 26 respectively (SD=13.844). Among this 51(72.9%) were Periapical cysts, 4(5.7%) were Dentigerous cysts. The most prevalent remaining Nonodontogenic cyst were Nasolabial, Nasopalatine cysts, Lateral periodontal and Residual cysts. The commonest age groups were the first and second decades of life. The location of this cysts were mostly in Anterior maxilla 49(70%).

Conclusion: Odontogenic cysts were the most frequent lesion of the jaw that was in this study. Females were more commonly affected. Periapical cyst followed by Dentigerous cyst were the most common inflammatory and developmental odontogenic cysts respectively.

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1. INTRODUCTION

1.1 BACKGROUND

Cyst is an expansile process in the jaw affecting both of the mandible and the maxilla also overlying soft tissue or any of orofacial region. It is a pathologic cavity within the hard and soft tissue which may contain fluid, semi fluid or gaseous material either lined by an epithelium, fibrous tissue or neoplastic tissue (1). It occurs more in the jaw bones commonly due to the presence of numerous rests of odontogenic epithelium that remain after tooth development (1).

The development of cyst involves initiation and expansion phase. Infections and other precipitating factors (e.g trauma)play a role in the initiation of the cyst that leads to the formation of a cyst by proliferation of the epithelial lining, fluid accumulation within the cyst cavity, bone resorption. Once it is formed it begins to enlarge by increasing the volume of its content and surface area of the sac, resorption of the surrounding bone and possibly vie displacement of the surrounding soft tissue(1).

Cysts in the oral and maxillofacial region are basically classified in to two categories intraosseous and soft tissue. Furthermore intraosseous cysts are classified as epithelial, nonepithelial and cysts of the maxillary antrum. Epithelial cyst can either be odontogenic (OC)and non odontogenic cysts(NOC). Cysts that arise from tooth germ apparatus (epithelial rests, dental lamina remnants, degenerative epithelium surrounding a tooth germ that is impacted or partially unerupted or from the tooth germ itself) are named odontogenic cysts while those that arise from the epithelial remnants of embryonic structures that are required for the development of the maxillofacial skeleton or from various organs in the head and neck region are named non odontogenic(2).

Classification of cyst according to 2017 world health organization(WHO) classification regarding odontogenic lesions outlining changes from the 2005 WHO classification had classified odontogenic cysts as inflammatory and developmental origin. Off which radicular cyst and collateral inflammatory cyst are included as inflammatory while dentigerous cyst, odontogenic keratocyst, lateral periodontal and botryoid odontogenic cyst, gingival cyst, glandular odontogenic cyst, calcifying odontogenic cyst, orthokeratinezed odontogenic cyst are included as developmental (3,4). Non odontogenic cysts are nasopalatine duct cyst, nasolabial cyst,

thyroglossal tract cyst, branchial cyst, epidermoid cyst , epidermal inclusion cyst, tricholemmal cyst, dermoid cyst, teratoid cyst, hetrotropic gastrointestinal cyst (2,4). Most of this cystic lesions are asymptomatic and seems to have similarities in presentation both clinically and radiologically which makes then prone to miss diagnosis with one another. For this reason correct diagnosis plays critical role as such because some of this lesions have a higher recurrence rate and aggressiveness (1,2). Also both OCs and non NOCs seems to be associated with different age range, sex distributions as well as specific anatomical site preference plus ethnic variation depending on the type of cyst (10,11)

1.2 STATEMENT OF THE PROBLEM

Cysts of the jaw are not a rare clinical condition like other oral diseases due to the presence of numerous rests of odontogenic epithelium that remain after tooth development (2). They are pathologic cavity within the hard and soft tissue which may contain fluid, semi fluid or gaseous material either lined by an epithelium, fibrous tissue or neoplastic tissue affecting both the maxilla and the mandible or orofacial structures involving the bone either or both the soft tissue(1). Epithelial intraoseaous cysts can either be odontogenic or nonodontogenic. odontogenic cysts are cysts that arise from tooth germ apparatus. Nonodontogenic cysts are cysts that arise from the epithelial remnants of embryonic structures(2).

Depending on the type of cystic lesion whether odontogenic or nonodontogenic their distribution seem to show preference to specific anatomic sites(2), vary according to different age groups as well as sex distributions(8,9). Some researches even indicate demographic relations to the occurrence of cystic lesions(11).

Most of this lesions seems to have a similar clinical and radiographic presentation(imaging pattern) which hiders proper diagnosis. In addition some of this lesions have high recurrence and aggressive nature resulting in extensive damage mandating early diagnosis and surgical management. At the same time due to the fact that some of this lesions have also clinical similarities with tumors like ameloblastoma up on presentation or could have the probability of transforming in to one, indicates its need for early diagnosis and management. In addition the nature of most of this cystic lesions unlike inflammatory cysts is that they are asymptomatic in a way that they are found either through routine examination or when they enlarge or become visible

after causing destructions. In which all will mandate the significance of early diagnosis by increasing awareness of the nature and distribution of this cystic lesions in this population.

The asymptomatic nature of most of this cystic lesions makes early diagnosis difficult in our country since routine medical checkups are not accustomed. Both of this cystic lesions have a tendency to cause functional dysfunction, like Dentigerous cyst which limits eruption of permanent tooth, destruction of the surrounding anatomic structure as they enlarge resulting in disturbance of occlusion which further could result in both esthetic and functional difficulties as such causing tempromandibular dysfunction, weakening of the facial bones resulting in fracture and disfigurement in the long run.

Many literatures have tried to address the pattern and distribution of the occurrence of cysts in different countries and have tried to point out the most prevalent odontigenic and non odontogenic cysts by evaluating clinical, radiographic data and through histophatologic examination (7,8,9,10).In Africa there seems to be little data in regard to this including Ethiopia. Considering the racial/ethnic difference in a specific population some researches suggests more research to be done in different racial groups(11,12). In fact having the knowledge assists to improve the treatment prognosis; help to address few odontogenic cyst with aggressive behavior with high tendency of recurrence.

This study is therefore of great importance because it is necessary to investigate all odontogenic and nonodontogenic cyst in this environment. It will help to compare the results from this research with other countries in addition it will also help to the asses demographic data. Over all the data obtained from this study provides theoretical knowledge adding in early diagnosis, treatment as well as prevention. The objective of the study is to determine the prevalence and pattern of cysts among patients who visited maxillofacial surgery department from January 2018 to January 2020.

1.3. JUSTIFICATION/ SIGNIFICANCE OF THE STUDY

The significance of this study is to provide insight in this population since few study has been conducted so far in this topic and to increase the awareness of clinicians regarding the distribution and frequency of the occurrence of both odontogenic and nonodontogenic cyst. In addition it helps to provide knowledge in assisting in early diagnosis and treatment of epithelial cysts. Perhaps helps to address few odontogenic cyst with aggressive behavior and those with high tendency of recurrence. At the same time helps to determining the demographic distributions in this population. It provides a base line for the development of further research in this related topic. It also helps in a way for the development of better performance of practitioners in the future; as a result of which increases early diagnosis and adequate surgical therapy because treatment and prognosis of variable lesions are different. Considering the racial differences that was observed from the above researches and the fact that no research of this nature was found in Ethiopia indicates the need. In conclusion the epidemologic data obtained from this study provides an insight on the distribution and pattern of epithelial cyst to aid in the clinical management of both odontogenic and nonodontogenic cyst and be a base for future researchers and investigators. Over all helps in providing information on disease to make decisions, rule and policies for health planning and to effectively allocate resources.

2. LITRATURE REVIEW

Many researchers have tried to address cysts of the jaw and associated risk factors off which one was a research done in sicily, Italy to assess the prevalence and distribution of odontogenic cyst from 1986 up to 2005, which was retrospective cross sectional study aimed at in assessing the prevalence, behavioral and demographic data. Twenty years retrospective study was carried at odontostomatologic clinic of university of palermo out of 12,197 patients who attended the clinic a total of 1310 patients were found to be diagnosed with cysts of the jaw by histological findings off which 708 were males and 602 were females with a mean age of 35.1. Out of this 1273 where found to be odontogenic (692 males and 581females with a ratio of 1.19) the most common being radicular cyst 1107(84.5%) followed by dentigerous cyst 149(11.4%) and keratocyst 17 (1.3%). Nonodontogenic cysts were found to be 37 off this 16(43.2%) were male and 21(56.8%) were female with a ratio of 0.76, among this the most common were psuedocyst 28(2.1%) and fissural 9(0.7%). Male seems to show a higher prevalence in inflammatory cysts mainly radicular cysts with a ratio of 1.15,out of 1107 patients with radicular cyst 592(53.5%) where males and 515 (46.5%) where females and the mean age was 35.6. Likewise 91 male and 58 females with M/F ratio of 1.57 and mean age group 31years were diagnosed with dentigerous cyst. Mean while out of 1.3% of odontogenic keratocyst M/F ratio were1.12 and mean age were 39.1. The most prevalent location of radicular cyst were anterior maxilla (68.6%) and mandible (41.5%) and for dentigerous cyst were anterior maxilla(72.1%) and posterior premolar part of mandible(70.5%). Posterior molar part of the mandible is the most prevalent are for keratocysts (5).

Similarly in a study conducted in Mexico to determine prevalence and clinical-demographical characteristics of OC in a Mexican population, 753 cases of OC coming from the archive of a head and neck histopathological teaching service, from January 2000 to December 2013, were included in the study based up on 2005 WHO classification of odontogenic Cyst and Tumor. In this retrospective study demographical and clinical data were obtained from medical files: gender, age at moment of diagnosis, and lesion location were assessed from lesional tissue embedded and preserved wax block. Both of the jaws (upper and lower) were divided into anterior zone and posterior zone, anterior zone was considered from right upper canine to left upper canine in case of maxilla and from right lower canine to left lower canine in case of mandible; while posterior zone was considered the area comprised from the first bicuspid to the third molar, irrespective of whether it was right or left. From a total of 10,970 cases,753 were diagnosed as OC from this

369(49.1%) were female and 384(50.9%) were male(P>0.05). Posterior mandible was found to be the most common location with 260 cases (34.5%) followed by anterior maxilla with 193 cases (25.6%) and the maxillary posterior area with 144 cases (19.1%). Majority of OC 148 cases (19.6%) were found in the 10-19 year old age group, 129 (17.1%) cases were in the 30-39 year old age group, 52.9% of them were in their 2nd- 4th decade of life. Radicular cyst was found to be the most common type with 408 cases(3.7%), followed by dentigerous cyst with 309 cases(2.8%). Radicular cysts were more frequent in maxillary anterior zone mainly associated to central and lateral incisor teeth, more frequent in females (p 0.0002), peak at their fourth decade of life. Dentigerous cysts were more frequent in the mandibular posterior zone of males (p 0.0000) in their second decade of life, mainly associated to third molars. In addition 18 cases of residual cysts, were identified, most frequently found in females at their 6th decade of life, located primarily in the posterior area of the mandible, mainly in the premolar area. Six cases of periodontal lateral cyst; 4 cases of paradental cysts; 4 eruption cysts and 4 cases of adult gingival cyst, as well were identified(6).

In another study done in Turkish population to determine the relative frequency and distribution of odontogenic and nonodontogenic cyst during the period of 9yrs from 2000- 2008, among 12350 individuals 5500 male and 6850 female off which a total of 434 was diagnosed with jaw cyst based on histopathologic, clinical and radiographic evaluation vie panoramic, periapical and CT. Age, gender. type and number of cyst, lession location was obtained from the data and the maxilla was classified in to three anatomic region anterior, premolar and molar and the mandible in to four anterior ,premolar, molar, ascending ramus. In addition the imaging pattern was classified in to unilocular, lobulated or multilocular. From 434 cases 233 were males and 201 were females, with a prevalence of 3.51%. From this 459 cysts were diagnosed in which 247 (53.8%)cases were males and 212(46.2%) cases were females with (P<0.05).Among this 413 patients (95.2%) had solitary cyst, 18 patients (4.1%) had two cysts, 2 patients (0.5%) has three cysts, 1 patient (0.2%) had four cysts. Out of this 452 (98.5%) were OC and 7(0.2%) were NOC. From OCs 314 (69.5%) were inflammatory and 138 (30.5%) were developmental. Out of this OC radicular (54.7%) being most frequent followed by dentigerous (26.6%), residual (13.2%), odontogenic keratocyst (3.3%) and lateral periodontal cyst (0.2%). Nasopalatine duct cyst (1.5%) was the only NOCs. This study didn't found any statistical significance difference between males and females with male to female ratio of 1.1:1.The age distribution were from first to eighth

decayed of life in which 378 (82.4%) cases were found in the 2nd, 3rd, 4th, 5th decayed with a peak in the 3rd decayd,111 cases (24.2%). Most radicular cysts occur in the 3rd decay(25.9) and dentigerous in the fourth decay (34.4%), residual cyst(25.4%) in the 6th decay and odontogenic keratocysts in the 2nd (26.7%) and 6th (26.7%) decade of life. No statistical significance was found regarding cyst distribution between maxilla and mandible ($p>0.05$). Maxillary anterior region 152 cases (152 cases,33.1%) was the most frequent site followed by madibular molar (121 cases,26.4), mandibular premolar (54 cases,11.8%), maxillary pre molar (50 cases,10.9%). Unilocular radiographic presentation was the most frequent (93.7%) followed by lobulated(5.0%), mulitilocular(1.3%). OKC showing the most lobulated and multilocular pattern. From the total of 459 cases, in 67(14.6%)cases pathologies associated with the cystic lesion were found, most frequent being root resorbtion (6.5%) mostly radicular cyst followed by displacement of the adjacent tooth and/or root(4.6%), displacement of impacted tooth(2.6%) and prevent eruption of adjacent tooth (0.9%). The last two were seen mostly associated with dentigerous cyst which was statistical significant ($P<0.001$) and the same is true with radicular cyst and its association with root resorption (7).

On a similar note in a study conducted to assess the relative frequency and demographic profile of non-odontogenic jaw lesions in an Iranian population using demographic and biopsy information of all patients with non-odontogenic lesions of the jaw bones submitted to the Oral Pathology Department of Dental School of Tehran University of Medical Sciences from 1984 to 2014, over a 30- year period study included demographic profile of age at the time of diagnosis, gender and location of lesion. The classification used for odontogenic lesions and non-odontogenic lesions was according to the latest edition of Neville oral and maxillofacial pathology textbook. This study basically classified non odontogenic jaw lessions into cystic lesions, tumors and tumor-like lesions, and infectious/ inflammatory/reactive lesions. Out of 3,669 intra-osseous jaw lesions, 2,697 (73.5%) were odontogenic lesions and 972 (26.4%) were non-odontogenic lesions. which showed 2.77 times increment on odontogenic than non-odontogenic lesions. From this non-odontogenic lesions, 346 (35.6%) involved the maxilla, 566 (58.2%) involved the mandible, 3 (0.3) involved both jaws and the location of 57 (5.8%) cases was not specified. The ratio of mandibular to maxillary lesions was 1.63:1. From these, 549 (56.4%) cases were in females, 412 (42.3%) cases were in males, and the gender of 11 (1.1%) cases was not specified. The age range of these patients was 2-90 years with a mean age of 29.09 years. The most frequent nonodontogenic

lesion was central giant cell granuloma (CGCG) (341; 35%), followed by ossifying fibroma (95; 9.7%), osteomyelitis (83; 8.5%), aneurysmal bone cyst (53; 5.4%), fibro-osseous lesions (51; 5.2%), nasopalatine duct cyst (48; 4.9%), Langerhans cell histiocytosis (34; 3.5%), lymphoma (27; 2.7%), osteoma (27; 2.7%), fibrous dysplasia (25; 2.5%), osteosarcoma (25; 2.5%) and traumatic \bone cyst (25; 2.5%). From non odontogenic cysts nasopalatine duct cyst was the most common lesion observed 48(75%). This lesion was frequently seen in males and the mean age of patients was 39.56 years followed by Surgical cilliated cyst 16 (25.0%) frequent in 10 (62.5) with a mean age of 44.9 mostly in maxilla, the same is true for nasopalatine duct cyst(8).

On the contrary in another study that was conducted in Sheffield, England in determining range of all histologically diagnosed odontogenic cysts along with age range, sex distribution and site of presentation over a 30-year period occurring during 1975–2004; a total of 55446 specimens were received from Hospitals in Sheffield and the South Yorkshire/East Midlands region, occasional hospitals elsewhere and General Dental Practitioners and 7121 (12.8%) specimens were diagnosed as odontogenic cysts. Off which 553 (7.8%) were diagnosed in children 16 years and under and 6385 (89.6%) were diagnosed in adults 17 years or older, the remaining 183 cases (2.6%) no information was provided with regards to their age. Out of this specimens 3972 were from male patients and 3137 were from female patients (M:F = 1.27:1),in the remaining 12 cases (0.2%), the gender of the patient was not provided. The site of presentation was known in 5323 (74.8%) of all submitted cases. Radicular cyst was the most common diagnosis 3724(52.3%) with male predominance with M:F ratio 1.06, followed by dentigerous cyst 1292(18.1%) again with male predominance with M:F ratio 1.86 followed by odontogenic keratocysts 828 (11.6%), Residual cyst 573 (8.0%), Paradental cyst a 402 (5.6%), Unclassified odontogenic cyst 210 (2.9%), Lateral periodontal cyst 28 (0.4%), Calcifying odontogenic cyst 21(0.3%), Gingival cyst 16(0.2%), Eruption cyst 15 (0.2%), Glandular odontogenic cyst 11 (0.2%) and lastly Epstein pearl 1(0.0%). Anterior maxilla was the most commonly affected site by radicular cyst 1478 cases (52.8%), out of 2801 cases where the site of occurrence was indicated in which 1996 being in the maxilla. Similarly the most common site for residual cyst is the anterior maxilla closely followed by the mandibular molar region. Adults 3359 cases (52.6%) were commonly affected by radicular cyst than paediatric patients 241 cases (43.6%). For dentigerous cysts the lower molar region accounted for 733 cases(73.2%) followed by the anterior maxilla with 106 (10.6%) cases. Mean age at diagnosis was 41 years, with a gradual increase per decade until the fifth decade after which there

is a steady decrease in number, the mandible was the most commonly affected site with 817 (81.6%) cases among 1001 cases from which the site of presentation was known. There were higher proportion of odontogenic cysts in children (28.9%, 160 cases) than in adult population 17.4%, 1114 cases. with odontogenic keratocysts mandible was the most frequently affected site with 545 cases, 71.1% of the 795 (96%) cases of known site of presentation with a mean age at presentation of 41 years and M/F ratio of 1.27:1. Specially the mandibular molar region are the most common regions with 236(30.8%) cases. For odontogenic keratocyst two peaks of presentation are evident the first between the ages of 1 1–30 years and the second between the ages of 51– 7 0 years. Likewise the same is true for paradental cyst with 340(84.6%) cases located at the mandibular molar area with a mean age at diagnosis of 29 years and a M/F ratio of 1.37:1.Paradental cysts were twice as common in adults than in children (5.9% and 2.7% respectively). In paediatric patients both dentigerous and calcifying odontogenic cysts were less common in males than in female patients (0.55:1 an d 0.33: 1 respectively). Of all the odontogenic cysts, only the gingival cysts of adults occurred more frequently in female than in male patients with M:F of 0.33: 1. All in all of the 7121 cases 2212 (31.1%) cases were developmental and 4699(66%) were inflammatory and the remaining 210 (2.9%) were Unclassified odontogenic cyst (9).

Mean while in a study conducted in India in analysis of 153 cases of odontogenic cysts in a South Indian sample population through a retrospective study by studying biopsy specimens obtained from the archives of the Department of Oral and Maxillofacial Pathology, College of Dental Sciences, Davangere, Karnataka, India, over a decade among 2275 cases of oral biopsy specimens that was retrieved, 194 cases (8.5%) were jaw cysts, 153 cases (6.7%) being odontogenic cysts and 5 cases (0.25%) being nonodontogenic cysts. From this odontogenic cysts 106 cases (69.3%) were radicular cysts frequently seen in the second and third decades, 31 cases (20.3%) were dentigerous frequently seen in the second decade, 8 cases (5.2%) were keratinizing odontogenic (KOC) frequently seen in the third decade of life, 5 cases (3.3%) were residual, and 3 cases (1.9%) were other cysts, such as lateral periodontal, botryoid odontogenic, and gingival cysts. From odontogenic cysts 84(55%) of specimens were observed in men and 69(45%) of specimen were observed in women, with a M/F ratio of 1.2:1. In the second decayed of life 52 cases (33.9%) and in the third decades of life 42 cases (27.4%) were observed with mean age of 28 years (range: 6–84 years). From the total of the 153 odontogenic cysts the location of 88 cysts (57.5%) were on

the maxilla most commonly affected site was the anterior region (82 cysts,53.6%) and 65 cysts (42.5%) were on the mandible, the most common site was the posterior region (48 cysts, 31.4%). For inflammatory cysts (radicular or residual cysts) the most frequent locations were the anterior maxilla (59 cysts, 53.2%) and the posterior mandible (39 cysts, 35.1%). KOCs were most common in the mandible while Dentigerous cysts were most commonly seen in the anterior maxilla (20 cysts, 64.5%). Swelling weather associated with pain or not are the most common clinical manifestation. Most cases were discovered through radiographs especially of developmental origin . Over all there were 111(27.6%) cases of inflammatory cysts and 42 (72.6%) cases were of developmental cysts(10).

On the other hand in a retrospective study conducted in sub-Saharan Africa in determining the Pattern of Odontogenic and Nonodontogenic Cysts in Kenyan population at the Departments of Oral and Maxillofacial Surgery and Oral Medicine and Pathology, University of Nairobi Dental Hospital from 1991 to 2010 (19 years) 4257 oral and maxillofacial lesions was evaluated and194 cysts (4.56%) were diagnosed in which 57.2 % were OCs and 42.8% were NOC lesions of the bone and soft tissues. From OCs 68 (35.1%) were developmental and 43(22.2%) were inflammatory lesions. The classification was according to the World Health Organization. From the 194 biopsy specimen 64.4% were from male and 35.6% were from female patients making M/F ratio 1.8:1.With an age range of 1 to 70 years (mean, 23.76 [SD, 14.05] ; peak and median of 20 years). The most common developmental OCs 61 cases (31%) were dentigerous occurring between the age of 4 and 60 years with mean age of 22.7 years and the most common inflammatory OCs were radicular cyst 43cases(22%) occurring between the age of 7 and 70 years, whereas the most common nonodontogenic cyst (42.8%) was nasopalatine duct cyst 51 cases (26.3%) between the age of 5 and 57 years. Other soft tissue cysts reported were epidermoid 13 cases, branchial 4 cases, thyroglossal 4 cases, dermoid 2 cases, and cystic hygroma 1 case. This research finally made a conclusion that Oral and maxillofacial cysts are not uncommon in this population and that the cysts are male predominant, the majority being dentigerous cyst from OCs, followed by nasopalatine cyst from nonodontogenic cyst. They occur 10 to 15 years earlier compared with those in the white population(11).

Mean while in a retrospective study conducted in Ethiopia, Addis Abeba in BLSH at pathology department in a retrospective study done on the odontogenic tumors and cysts and bone lesions

diagnosed from Sep 2013 - Oct 2018 a 5 years study in which age, gender, site of tumor and histopathologic typing were analyzed among the 107 cases having complete records suitable for the study from a total of 132 patient. Fifty nine (55.1%) of the study subjects were males while the remaining 48(44.9%) were female with M:F ratio of 1:1.2. Mean age of patients was 27.8years. This study used 2005 World Health Organization classification system of odontogenic tumors. Mean age of the patients was 27.8 years in which the minimum age was 2 years and the maximum was 67 years. The first and second decades were the commonest age group for both neoplastic and nonneoplastic lesions. One hundred one (94.4%)of the biopsy specimen were received from Maxillofacial surgery unit of Yekatit 12 Hospital, 5(4.7%) from Tikur Anbesa Hospital and the remaining 1(0.92%) of the case was from Addis Ababa University Dental School. Among the 107 cases 60(56.1%) of cases were Benign, 16(15.0%) were Malignant and the rest 31(29%) were nonneoplastic. From this 55(51.4%) of all cases occurred in the mandible, 46(43.0%) in maxilla, 4(3.7%) in jaw(exact site not specified) and the rest 2(1.9%) were in other site. Out of the total 31 non-neoplastic cases, odontogenic cysts were 27(87%) in which 17(63%) occurred in males and 10(37%) in females with mean age of occurrence of 31.56 years. Benign Odontogenic cyst 9(33.3%) were the most frequent, followed by dentigerous cyst 8(29.6%), Odontogenic keratocyst 5(18.5%) and Radicular cyst 5(18.5%)(fig5). The maxilla 17(63%) were the most commonly affected location by odontogenic cysts followed by mandible 9(33.3%).This study finally concluded that Odontogenic tumors, cysts and maxillofacial bone lesions show a definite geographic variation(12).

In conclusion odontogenic and nonodontogenic cysts seems to have variation in different age group as well as sex and anatomic location and the knowledge of this variation is important in the clinical management to aid in the treatment prognosis.

3. OBJECTIVE OF THE STUDY

3.1 GENERAL OBJECTIVE

- The aim of this study is to investigate the prevalence and pattern of jaw cysts among patients who visited maxillofacial surgery department from January 2018 to January 2020.

3.2 SPECIFIC OBJECTIVES

- To determine the presence of odontogenic and nonodontogenic cysts
- To ascertain the pattern of odontogenic and nonodontogenic cysts
- To determine sex distribution of odontogenic and nonodontogenic cysts
- To determine age range for different types of odontogenic and nonodontogenic cysts
- To investigate geographic distributions of odontogenic and nonodontogenic cysts
- To aces surgical intervention

4. METHODS & MATERIALS

4.1 STUDY AREA & PERIOD

This study was conducted in TASH Addis Abeba University college of health science oral and maxillo facial surgery department in Addis Abeba, Ethiopia starting from January 2019 until January 2020. Addis Abeba is the capital city and also biggest c

ity of Ethiopia which lies few miles west of rift valley. It is located at 9°1′48″N 38°44′24″E, with area coverage of 527 km^2 and with an elevation of 2355 m. The Climate is characterized by sub tropical highland climate .It is one of Ethiopia's principal economic and educational centers with a total population of 2,739,551 urban and rural inhabitants according to the 2007 population census conducted by the Ethiopian national statistics authorities(13).

The health facility in Addis Abeba city is composed of 52 hospitals, 12 of them state run in addition more than 40 private(14).Tikur Anbesa Specialized Hospital is one of the leading health facilities in the country which was established in 1964 run by the state. Serving as one of the main referral hospitals in the country, which provides trainings for most disciplines and specialized services to the public. It envelops various departments, facilities, interns and residents under specialty training in the school of medicine including oral and maxillofacial department(15).

The study had taken a total of nine months.

4.2 STUDY DESIGN

A retrospective Cross-sectional descriptive design was used.

4.3 POPULATION

4.3.1 SOURCE POPULATION

All patients who visited maxillofacial surgery OPD from January 2018- January 2021.

4.3.2 STUDY POPULATION

All patients who were diagnosed with jaw cysts in the specified study period and visited maxillofacial surgery OPD

4.3.3ELIGIBILITY CRITERIA

4.3.3.1 INCLUSION CRITERIA

- ✓ Complete medical record of the patient
- ✓ Odontogenic cyst and Non odontogenic cyst according to 2005 WHO classification
- ✓ Cases with unambiguous histopathological diagnosis

4.3.3.2 EXCLUSION CRITERIA

- ➢ Cases that cannot fulfill the inclusion criteria

4.4 SAMPLE SIZE DETERMINATION AND SAMPLING PROCEDURE

4.4.1 SAMPLE SIZE DETERMINATION

All cases with jaw cysts within study period was taken as a sample from the charts.

4.4.2 SAMPLING PROCEDURE

Target population of the study were all odontogenic and non odontogenic cystic cases diagnosed at oral and maxillofacial surgical OPD collage of health science, AAU. A fully recorded charts of the patients data were retrieved from the record room of the department registered from January 2018 to January 2020 and were subjected to review of the clinical, anatomic site, demographic, type of cyst, final diagnosis based on the prepared check list.

4.5 STUDY VARIABLES

4.5.1 DEPENDENT VARIABLE

- ➢ Odontogenic and non odontogenic cysts

4.5.2 INDEPENDENT VARIABLE

- ➢ Sex distribution
- ➢ Anatomic site
- ➢ Age range
- ➢ Socio demographic

4.6. DATA COLLECTION TOOLS AND PROCEDURES

For this purpose a predetermined check list on the variables was prepared based on previous studies that where conducted in different countries, in which an English language was used to record the findings. Demographical and clinical data were obtained from medical files: gender, age at the moment of diagnosis, lesion location and the type of cyst were assessed. The location of the cyst were categorized in six groups; Anterior maxilla and mandible being from canine to canine, posterior maxilla and mandible indicating the premolars and molars and involving the whole maxilla and mandible. The samples were collected from the OPD in black lion Hospital and dental health and training center AAU. All cases were given a code and de-identified prior to analysis.

4.7 DATA MANAGEMENT AND QUALITY

The data were checked for completeness with the fulfillment of all the necessary information considering the inclusion criteria. At the same time the data were coded and collected. The reviewed data were checked prior to data entry for completeness, accuracy, range and consistency regularly to ensure the quality of the data. Any results that are incomplete or appear to be out of range or do not comply with the consistency checks were not used.

4.8 DATA ANALYSIS

The completed check list were checked for completeness, consistency and were categorized and then coded. The data were entered and the analyzed with SPSS version 26.0. The results were presented using descriptive statistics including frequencies tables, percentages, graphs, mean, and standard deviation for variables under the study. To see the association between dependent and independent variables chi-squared test were used.

Then data cleanup were performed to check for, accuracy, consistencies, & values. Any error that were identified were corrected. And the statistical significance were accessed with 95% confidence interval.

4.9 OPEATIONAL DEFINITIONS

Odontogenic cyst- Cysts that arise from tooth germ apparatus like epithelial rests, dental lamina remnants, degenerative epithelium surrounding a tooth germ that is impacted or partially unerupted or from the tooth germ itself

Nonodontogenic cyst- Cysts that arise from the epithelial remnants of embryonic structures that are required for the development of the maxillofacial skeleton or from various organs in the head and neck region

4.10 LIMITATION OF THE STUDY

The limitation of this study were, since previous study has not been found of this nature in this country there is a reference limitation. Plus Some medical records or files were found to be incomplete, missing as well as lost. Even though TASH is a tertiary referral center for the country, this hospital based study were not a representative of generalized entire population.

4.11 ETHICAL CONSIDERATION

The Proposal were submitted to the department of oral and maxillofacial surgery and ethical approvals were obtained from the ethical review committee of the department and the institutional review board and research and publication committee of the medical faculty of Addis Ababa University. Accordingly, permission letter were secured from medical director at TASH.

4.12 DISSEMINATION OF STUDY FINDINGS

The results from this study can be used to make recommendations for the future and enhance the knowledge of the practitioners. I will require the expertise and knowledge from a research mentor or facilitator to review my study before submission. The findings may also encourage further studies in this area. These findings will be disseminated to AAU school of medicine and AAU University department of Oral and Maxillo facial surgery in partial fulfillment of the requirement for the award of Oral and Maxillo facial surgeon in AAU University, to Oral and Maxillo Facial surgery Professionals Association, to Dental Professionals Associations and to funding agencies if any. Copies of the findings will be submitted to articles of peer review journals.

5- RESULT

Of all the total of 85 cases that were reviewed 15 cases were found to have incomplete relevant clinical data, were unable to fulfill the inclusion criteria for which they were excluded. The remaining 70 cases were included in the study, Among this 38(54.3%) were females and 32(45.7%) were males (Table 1). With a total of female to male ratio off 1.19. From this cases the minimum age were found to be 11 yrs and the maximum were 74 yrs with a range 63 yrs. The mean and median ages were 30.01 and 26 respectively with a standard deviation of 13.844 (Table 2). The commonest age groups were the first and second decade of life (Figure 1). From the total of 70 cases 59(84.3%) were found to be diagnosed with Odontogenic cyst and 11(15.7%) were found to be none Odontogenic in origin (Table 3).

Fifty nine (84.3%) cases had surgical intervention done while for the remaining 11(15.7%) no surgical intervention were done (Table 4). Regarding city of residence 63(90%) where Addis Abeba residents, 4(5.7%) were from Oromia region, 2(2.9%) were from Amhara region, and the remaining 1(1.4%) were from South nation and nationality region (Table 5).

Out of total cases 51(72.9%) were found to be Periapical cysts, 4(5.7%) were found to be Dentigerous cysts, 3(4.3%) were both found to be Nasolabial and Nasopalatine cysts respectively, 2(2.9%) were found to be Lateral periodontal and Residual cysts respectively as well and the remaining 1(1.4%) each were Palatal cyst, Globulomaxillay cyst, Cysts of Maxillary antrum, Aneurysmal bone cyst and Gengival cyst of adults independently (Table 6 and figure 2). The location of this cysts were 49(70%) in Anterior maxilla, 14 (20%) were in Anterior mandible, 5(7.1%) were in Posterior maxilla and 2 (2.9%) were in Posterior mandible (Table 7). Among this 37(52.9%) were distributed in the duration of 0-1yrs, 11(15.7%) were 2-3 yrs, 4(5.7%) were in 4-5yrs, 5(7.1%) 6-7yrs and lastly 13(18.6%) were above 8yrs in total (Table 8).

Within the total of 59 cases of odontogenic cysts 30 were male and 29 were females. Among this odontogenic cysts 40 were located in the anterior maxilla, 13 were in the anterior mandible, 4 were in posterior maxilla, 2 in the posterior mandible and no cases were found to involve both the whole maxilla and mandible. Twenty seven cases of this odontogenic cysts were distributed in age groups of 21-30 yrs, 14 cases were in the 11-20 yrs age group, 9 cases where in 31-40 yrs age group and in the remaining age groups of 41-50yrs, 51-60yrs and 61yrs, 3 cases were found each.

In addition the remaining 11cases were non odontogenic cysts with 8 of them being males and 3 of them being females. In which 9 were found in anterior maxilla,1 in the posterior maxilla and 1 in the anterior mandible and no cases were found in posterior mandible as well as evolving neither the maxilla nor the mandible as a whole. While 4 cases were found in 11-20 yrs of age groups, 2 cases in 20-30 yrs, 2 cases in 31- 40yrs, 2 cases in 41-50yrs, 1 case were in the 51-60yrs of age and no case were found above this ages for the non odontogenic cysts.

Among the total of 59 odontogenic cysts 37 of the periapical cysts were located in anterior maxilla, 11 were in anterior mandible and 3 were in posterior maxilla making a total of 51 cases in which no case was found in involving the posterior mandible. While in dentigerous cyst 2 cases were found in posterior mandible,1 case in the anterior mandible,1 in the anterior maxilla and no data were found involving posterior maxilla making a total of 4 cases. Two cases were found to involve only the anterior maxilla in regards to residual cyst. One case of lateral periodontal cyst were found in the posterior maxilla and 1 in the anterior mandible making a total of 2 cases. Out of 11 non odontogenic cysts, 3 cases of nasopalatine duct cyst were located in the anterior maxilla and 3 cases of nasolabial cysts were also found in the same location as well. Over all from a total of all odontogenic and non odontogenic cysts 49 were found involving anterior maxilla,14 anterior mandible, 5 posterior maxilla and only 2 cases in the posterior mandible making anterior maxilla the most common location for both cysts and posterior mandible the 2nd most common location for odontogenic cysts. And posterior maxilla and anterior mandible were found to be the 2nd most frequent areas for the non odontogenic cysts.

Table 1- Gender Distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	38	54.3	54.3	54.3
	Female	32	45.7	45.7	100.0
	Total	70	100.0	100.0	

Table 2- Age

Age

N	Valid	70
	Missing	0
Mean		30.01
Median		26.00
Std. Deviation		13.844
Range		63
Minimum		11
Maximum		74
Percentiles	25	20.00
	50	26.00
	75	35.00

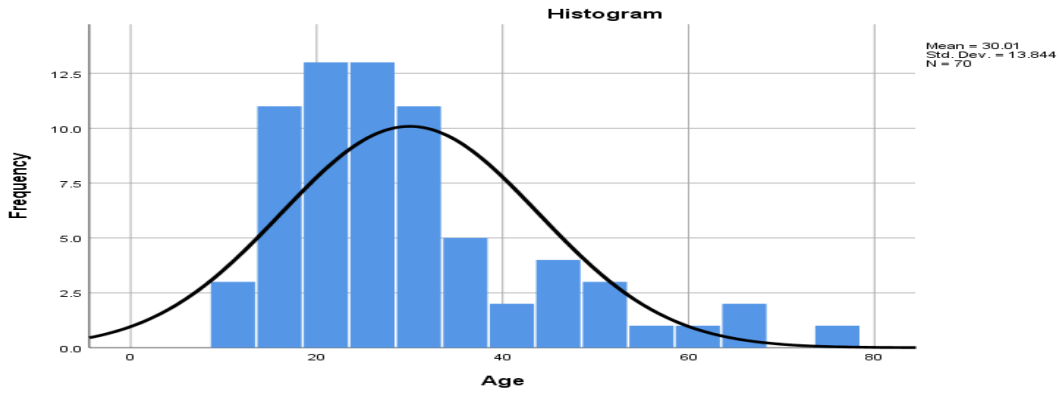

Figure 1 - Age Distribution in Frequency

Table 3- Type of Cyst

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Odontogenic Cyst	59	84.3	84.3	84.3
	Non odontogenic Cyst	11	15.7	15.7	100.0
	Total	70	100.0	100.0	

Table 4- Surgical Intervention

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	11	15.7	15.7	15.7
	yes	59	84.3	84.3	100.0
	Total	70	100.0	100.0	

Table 5- Distribution of Residence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A.A	63	90.0	90.0	90.0
	Amhara	2	2.9	2.9	92.9
	Oromia	4	5.7	5.7	98.6
	South	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

Table 6- Specific Cystic Lesion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	periapical cyst	51	72.9	72.9	72.9
	Gengival cyst of adults	1	1.4	1.4	74.3
	Aneurysmal bone cyst	1	1.4	1.4	75.7
	Nasolabial cyst	3	4.3	4.3	80.0
	Nasopalatine cyst	3	4.3	4.3	84.3
	Lateral periodontal	2	2.9	2.9	87.1
	Residual	2	2.9	2.9	90.0
	palatal cyst	1	1.4	1.4	91.4
	Globulomaxillary cyst	1	1.4	1.4	92.9
	Dentigerous cyst	4	5.7	5.7	98.6
	Cyst of maxillary antrum	1	1.4	1.4	100.0
	Total	70	100.0	100.0	

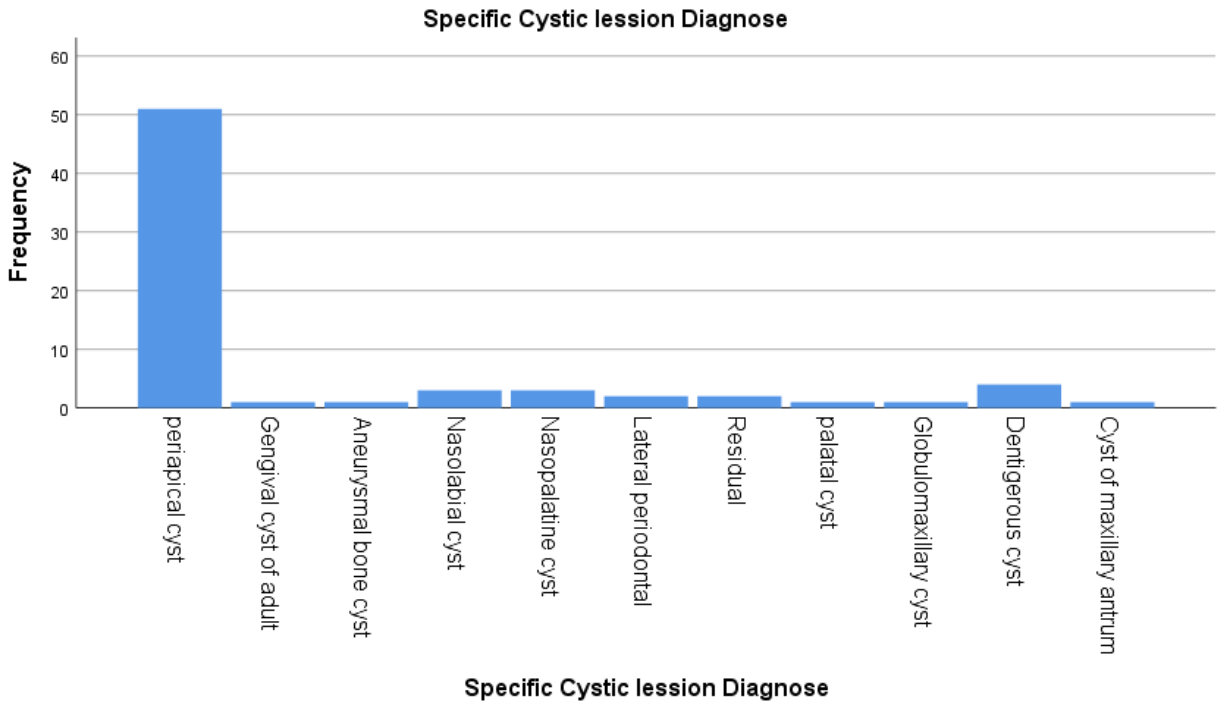

Figure 2- Specific Cystic lesion Diagnosed

Table - 7 Location of the cyst

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Anterior Maxilla	49	70.0	70.0	70.0
	Posterior Maxilla	5	7.1	7.1	77.1
	Anterior Mandible	14	20.0	20.0	97.1
	Posterior Mandible	2	2.9	2.9	100.0
	Total	70	100.0	100.0	

Table- 8 Duration of the cysts

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-1 yrs	37	52.9	52.9	52.9
	2-3 yrs	11	15.7	15.7	68.6
	4-5 yrs	4	5.7	5.7	74.3
	6-7 yrs	5	7.1	7.1	81.4
	> 8 yrs	13	18.6	18.6	100.0
	Total	70	100.0	100.0	

6. DISCUSSION

In this study classification of odontogenic cyst and Non odontogenic cyst according to 2005 WHO classification (3) were used as a reference to determine the prevalence from the data of 70 cases that were found, 59(84.3%) were found to be diagnosed with Odontogenic cyst and 11(15.7%) were found to be non Odontogenic cysts as seen to correlate with other studies making odontogenic cysts most prevalent (6,7,8,11). Among the odontogenic cysts the most frequent cyst were found to be periapical cyst 51(72.9%) and dentigerous cyst with 4(5.7%) being second most prevalent. This result was comparable to a study done in Italy, Mexico and Turkey (5,6,7) but in conflict with the study done in Kenya dentigerous (61) were most common followed by radicular cyst (43cases) .On the other hand nasopalatine duct cyst (same as the study conducted in Kenya(11)) and nasolabial cyst were the most frequent non odontogenic cysts with a frequency of 3(4.3%) each.

Out of these females were 38(54.3%) in which 30 cases were odontogenic and 8 were non odontogenic in contrast to males which occupied 32(45.7%). Mean while from this males, 29 cases were diagnosed with odontogenic cyst and 3 cases were nonodontogenic cysts. This result was found to be not comparable to other studies even from the ones that were conducted in Kenya (M/F ratio of 1.8:1) and Black lion hospital (male 59 and female 48) (9,10,11,12). Most of this odontogenic cysts were located in the anterior maxilla 49 (25 cases in males and 15 in females) making the distribution odontogenic cysts slightly higher for males than females in this location. This were also observed from previous studies conducted in Turkey (152,33.1%) , Iran (346,35.6%), India (82,53.6%) and Addis Ababa (17,63%) (7,8,10,12). The second common location for the odontogenic cysts were anterior mandible 13(4 in male and 9 in females). This contradicts the results that were found in England which indicates posterior mandible as the second most common location(9). The distribution of non odontogenic cysts showed similar results as odontogenic cyst with the most prevalent being anterior maxilla 9 (7cases in males and 2 cases in females) and least prevalent being posterior mandible.

The mean age of occurrence in the current study were 30.01 close to the study that were conducted in Iran (29.09) (8) with a median age of 26 and the standard deviation of 13.844. This results were different from previous conducted study in Kenya mean 23.76(SD 14.05) and range of 1-70 yrs(11). The minimum and maximum age being 11yrs and 74 yrs respectively in this study making

a rage of 63 yrs. The age distribution shows slight left shift from the normal curve. The first and second decades were found to be the most prevalent age groups which correlates with previous studies done in Turkey and Addis Abeba showing similar result (7,12), 14 cases of odontogenic cyst and 4 cases of non odontogenic cyst in the first decayed. While in the second decade of age group odontogenic cyst occupied 27 cases and non odontogenic cyst 2 cases. Which showed that odontogenic cysts were most prevalent in the second decayed while non odontogenic cysts were most prevalent in the first decay of age groups. The common odontogenic cyst in both first and second decay were periapical cyst 11cases in the first decay mostly in anterior maxilla (9 cases) and 25 cases the second decay mostly again in the anterior maxilla of 21 cases. In regards to nonodontogenic cyst nasoplatine cyst were more common in 1st decades (2 cases) while nasolabial cyst had equal distribution in second, third and fourth decayed of life each (1 cases), All of them where located in the anterior maxilla.

Majority of the cases were from Addis Abeba region 63(90%), 56 were odontogenic and 7 were non odontogenic cysts and the least being the Southern region in which only 1 case was found. Not much could be said to compare this because most of the cases were from addiss abeba and the amount data that was found was not representative enough. From the total reviewed cases 59 (84.3%) had surgical intervention done while for the remaining 11(15.7%) did not.

The most prevalent duration of time of the symptoms were found to be from 37(52.9%) from 0-1yrs, 13(18.6%) greater than 8 yrs, 11(15.7%) 2-3 yrs, 5(7.1%) 6-7yrs and the least were 4(5.7%) for 4-5 yrs. Indicating that the majority of the cases were diagnosed with in the first three years from the start of the symptoms.

The most prevalent cyst as were mentioned were periapical cyst in conflict from the Kenyan study indicating dentigerous cyst as most prevalent (61cases), making 72.9% within the location of all cysts, 37 (75.5%) in the anterior and 3(60.9%) in the posterior maxilla, the remaining 11 (78.6%) making the anterior mandible. On the same note 5.7% within the location of all cysts were dentigerous cyst indicating 2 (100%) in posterior mandible 1(7.1%) in anterior mandible and 1(2%) in the anterior maxilla respectively making dentigerous cyst the second most common cyst. Residual cyst 2.9% within location of all cysts were located in the anterior maxilla 2 (4.1%). Similarly lateral periodontal cyst occupied 2.9% within the location of all cysts but unlike residual cyst it was found in both posterior maxilla 1(20%) and anterior mandible 1(7.1%). On the other

hand nasopalatine and nasolabial cysts had shown similar distribution within the location of cyst 3(4.3%) involving anterior maxilla only 3(6.1%) each one of them.

Chi- square statistics were used to examine association between gender and Type of cyst. There is no significant association at 5% significance level between gender and Type of cystic lession (X^2 =1.789, df=1, p= 0.181). Chi- square statistics were also used to examine association between anatomic location of cyst and type of cyst. There is no significant association at 5% significance level between gender and type of cystic lesion (X^2 =1.479 , df=3, p= 0.687).

7. CONCLUSION

In this study odontogenic cysts were the most frequent lesion of the jaw. Females were more commonly affected by both odontogenic and non odontogenic cysts. Periapical cyst followed by Dentigerous cyst were the most common inflammatory and developmental odontogenic cysts respectively. Nasopalatine duct cyst and Nasolabial cyst were the most common non odontogenic cyst that were found, Anterior maxilla were the most frequent anatomic location for both cysts. The first and second decades of life were more prevalent age groups for both odontogenic and non odontogenic cysts.

8- RECOMMENDATION

Further large scale research is recommended to clarify the difference in this population. Awareness creation measures have to be implemented among health professionals and the community so as be able to identify the jaw cysts at an early stage.

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Letter to Chairperson of Ethics Committee of AAU

Mr/ Dr_____, Chairperson Ethics Committee,
Addis Abeba University,
Date_____

Re: To determine the prevalence and pattern of odontogenic and nonodontogenic cyst among patients who visited maxillofacial surgery department from January 2018 to January 2020

Dear Mr. / Dr., _____

I am caring out a cross sectional study to determine the prevalence and pattern cyst among patients who visited maxillofacial surgery department from January 2018 to January 2020 as part of my partial fulfillment of oral and maxillofacial surgery specialty program, which will need the collaboration of Tikur anbessa lion Referral Hospital and school of dentistry. By carrying out a review of the literatures, I have found that no previous research has been done on this related topic so; this research will be a base for further researchers and investigators. In addition it will provide theoretical knowledge in regards to the pattern of odontogenic and nonodontogenic cysts in our population.

A cross sectional study with random sampling and predetermined check list will be used as a study methodology.

Please see my stamped addressed envelope and research proposal enclosed as a hard copy and an e-copy. You can view my ethical considerations in the methodology section and copies of the letter to the medical director of AAU Black Lion Referral Hospital in the appendices of the proposal.

Please contact me if necessary. Thank you for your time,

Yours sincerely,