PATTERN AND DISTRIBUTION OF PRIMARY MALIGNANT LESIONS OF ORAL AND MAXILLOFACIAL REGIONS IN PATIENTS TREATED AT JIMMA UNIVERSITY MEDICAL CENTER,A 5 YEARS RETROSPECTIVE STUDY

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REASERCH PAPERTO BE SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR SPECIALTY CERTIFICATE IN ORAL AND MAXILLOFACIAL SURGERY POSTGRADUATE PROGRAM OF JIMMA UNIVERSITY, INSTITUTE OF HEALTH SCIENCES, SCHOOL OF DENTAL MEDICINE

SEPTEMBER, 2019

JIMMA, ETHIOPIA

JIMMA UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

SCHOOL OF DENTAL MEDICINE

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ABSTRACT

Background: - Theprimary malignant lesions of oral and maxillofacial regions may refer to any cancers originating in the oral cavity, and jaw bones of mandible and maxilla. Locally destructive effects of these tumors, or their treatment, can have a damaging effect on the lives of patients by affecting their appearance; the vital functions of breathing, swallowing, talking and the senses of taste. These devastating effect and lack of any study in this specific area in Ethiopia has prompted us to propose this study.

Objective; This study aims to determine the pattern and distribution of primary malignant lesions of oral and maxillofacial regions in Jimma university medical center.

Methodology; All patients' record (83)ofprimarymalignant lesionsof oral and maxillofacial regions from Jul 1/2015 to Jun 30/2019 were retrieved from Jimma university medical center, maxillofacial unit registry. Reports with doubtful diagnosis, incomplete records and benign tumors were excluded. Finally, (77) eligible patients' data were collected, summarized and analyzed using SPSS version 20.0 program. Frequencies, percentages, cross tabulation of different variables were determined.The result was presented using figures and tables.

Result and discussion; The mean age of all patients was 46.66 years (SD± 17.249, range: 12 to 85 years). The overall male to female ratio was 2:1. Oral tongue was the most frequently involved site (19.48%). Squamous cell carcinoma (SCC) was the most common specific histological type comprising of 49.35% followed by mucoepidermoid carcinoma (MEC) 18.18 %. Most of the patients 52 (67.5%) had history of exposure to predisposing factors.

Conclusion and recommendation; Majority of primary malignant lesions of OMFR occurred in males and older adults were the mostcommonly affected age groups. Most of the patients' particularly younger adults had a history of exposure to predisposing factors. Creating increased awareness among peoples and providing health education about OMFRcancers and its prevention helpful in minimizing the diseases and early detection at its curable stages.

Key words: Oral and maxillofacial cancers, Prevalence

ACKNOWLEDGEMENT

Thanks and acknowledgement ought to be bestowed to almighty God the most beneficent and the most merciful. I would like to thank Jimma University for providing opportunity to participate in this thesis work. I am greatly indebted to my advisor Dr. Fanaye G/Meskel for her invaluable supervision, guidance, constructive critism and tremendous support throughout proposal development.

Last but not least I am thankful to the staffs of oral and maxillofacial surgery unit for their assistance and participation during completion of this research.

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ABBREVIATION

ASR Age Standardized Rate

FMH Federal Minister of Health

HPV Human Papilloma Virus

ICD International Classification of Diseases

JUMC JimmaUniversity medical center

MOTsMalignant Odontogenic Tumors

MEC Mucoepidermoid carcinoma

NHL Non-Hodgkin's Lymphoma

OMFR Oral and maxillofacial region

SCC Squamous Cell Carcinoma

SNC Sino nasal Cancer

WHO World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background

The oral and maxillofacial region is one of the most complex parts of our body both anatomically and structurally. This complexity contributes to the development of myriad of neoplastic processes with diverse behaviors and outcomes. One of these neoplasms is the malignant lesions which refer to a tumor that have a property of locally invasive and destructive growth without regard to anatomic boundaries and ability to metastasis. The term primary malignant lesions of oral and maxillofacial region may refer to any cancers originating in the oral cavity, and jaw bones of mandible and maxilla.(1)

Malignant lesions result from genetic mutations which causes complex changes in the tightly regulated molecular pathways that control cell proliferation and differentiation. These changes or derangements are checked and corrected by several naturally occurring processes before they result in uncoordinated cell proliferation and tumorigenicity. Multiple complementary changes are required to evade cellular checkpoints and cause cancer. These changes can be induced by many different cellular processes.(2)

The etiology of malignant lesions of oral and maxillofacial region is multifactorial and the major risk factors are tobacco smoking and alcohol consumption. A number of other risk factors have been identified including human papilloma viruses (HPV 16 and 18), ionizing radiation, nutritional deficiency, premalignant lesions and conditions.(3)

Tobacco smoking is considered as an independent risk factor and smokers are six to eight times more likely to develop oral cancer compared to nonsmokers. Exposure to carcinogenetic chemicals in tobacco smoke which are more than 300 in number combined with the heat have been found to leads to malignant transformation of cells. Quitting tobacco smoking for a short period of time (one to four years) results in a orofacial cancer risk reduction of about 30 per cent compared with current smoking and after 20 years can reduce the risk of developing oral cavity cancer to the level of a never smoker. (4)

Alcohol is the other major independent risk factor for head and neck cancer. Patients who continue to drink heavily after treatment for head and neck cancer have a significantly worse

quality of lifeand continued drinking has a negative impact on survival. The beneficial effects of quitting alcohol, on the risk of developing head and neck cancer, are only observed after more than 20 years, when the level of risk reaches that of non-drinkers.(4, 5)

Malignant lesions found in the oral and maxillofacial region include sarcomas of soft and hard connective tissue, carcinomas of the salivary glands, with SCC accounting for more than 90% of reported malignant tumours of the oral cavity, and also melanomas and those that metastasize from distant sites such as the breast, lungs, abdominal organs or even the prostate gland. Malignant tumours of the jaws are grouped into primary, as originating within the jaw bone and secondary, metastatic lesions that involve the bone secondarily.(6)

According to 4th WHO classification, malignant odontogenic tumors are sub-classified into seven entities that include ameloblastic carcinoma, primary intraosseous squamous cell carcinoma, sclerosingodontogenic carcinoma, Clear cell odontogenic carcinoma, Ghost cell odontogenic carcinoma, odontogenic carcinoma, and odontogenic sarcoma. The non odontogenicmalignant tumors include chondrosarcoma, osteosarcoma and mesenchymalchondrosarcoma.(7)

1.2 Statement of the problem

Globally, it was estimated that more than 360,000 new cases of oral and maxillofacial regions cancer were reported each year with two thirds of tumors diagnosed in developing countries. These tumors are responsible for approximately 150,000 deaths worldwide per year. The highest incidence of these cancers is mainly reported in South and Southeast Asia and some countries in southern Europe.(8)

The incidences of orofacial malignant tumors differ by subtype, country and sex. An incidence rate of 5% - 50% has been reported in various countries. This global variation may be due to various sociocultural characteristics, major differences in risk factors and data collection.(9)

Head and neck squamous cell carcinoma (HNSCC) is typically regarded as a disease of elderly people. However, increasing numbers of patients worldwide with HNSCC at younger age (defined as <45 years old) have been reported in recent years Incidence increases with age, and about 85% of cases occur after the fifth decade but in developing countries, the age range is much smaller, and oral cancer is seen in much younger people. The male: female ratio has decreased steadily over recent decades.(10)

The highest incidence of orofacial malignant lesions is found in south Asia and south part of Europe. Tobacco and alcohol use are the most important risk factors associated with orofacial cancer. Other risk factors are poor oral hygiene and the Human Papilloma Virus (HPV 16).Chewing tobacco, betel quid and areca-nut increases the risk of certain sub sites of the head and neck cancer in south Asian countries. Oral cavitycancer incidence rates have increased in many countries along with tobacco epidemics that are currently peaking and declined in areas where tobacco use has peaked in the past.(11)

Epidemiological studies from India have correlated the form and method of tobacco consumption to the site of involvement. “Bidi” smoking has been linked to cancer of the oral commissure and the tongue. “Reverse smoking” (“Chutta”) is a practice peculiar to parts of India and has been linked with an increase in the incidence of cancer of the hard palate. The habit of chewing “paan” has been linked to the increased risk of alveolobuccal cancer in the Indian subcontinent. Khaini is a mixture of tobacco and lime that is retained in the inferior gingivolabial sulcus and leads to cancer in this site.(12)

Use of substances such as alcohol, khat leaves (Catha edulis) and tobacco has become one of the rising major public health and socio-economic problems worldwide. Recent trends indicate that the use of substances have dramatically increased particularly in developing countries.(13)

The mortality rate remains high in most studies despite recent advances in locoregional control. Many studies have shown that many patients continue to present at the time of diagnosis with advanced locoregional disease (stage III or greater). This finding, despite advances in surgical and adjuvant therapies, suggests that earlier diagnosis and prevention are paramount in reduction in oral cancer prevalence and mortality.(14)

The five year relative survival varies from 20-90% depending upon the subsite of origin and the clinical extent of disease. While primary prevention is the potential strategy for long term disease control, early detection and treatment may have limited potential to improve mortality in the short term.(15)

Similar to other developing countries, the burden of noncommunicable diseases (NCDs) is increasing in Ethiopia. Cancer has become the second leading cause of death in the adult population. NCDs, including cancer, were among health targets of the Sustainable Development Goals; the Global Burden of Disease Cancer Collaboration and Breast Health Global Initiative stated that cancer control strategies were to be prioritized based on local needs and that data on cancer epidemiology would be necessary for the development of national NCD and cancer action plans.(16)At present, government resources for cancer care are limited to treatment only. There is no published evidence with regard to the prevalence of orofacial malignancy in Ethiopia. The aim of this study will be to present epidemiological aspects of primary malignant tumor of orofacial in Jimma University medical Center located in Jimma town south west of Ethiopia.

CHAPTER TWO

LITERATURE REVIEW

Socio-demographic distribution of primary malignant lesions

Worldwide, there are approximately 360,000 new cases of orofacialcancer diagnosed and 150,000 deaths each year. Oral cavity cancer (International Classification of Diseases-O-3 [ICD-O-3] C00–C08) is the eighth most frequent cancer in the world among males and the 14th among females, accounting for nearly 3% of all cancer cases worldwide. Annually, it is estimated that 127,459 deaths are caused from oral cavity cancer worldwide, of which 96,720 occur in developing countries. Mortality rates vary in accord with world regions and are lower in developed countries, despite the higher incidence rates observed in these countries.(17)

According to USA National Cancer Institute report, cancers of orofacial region account for 3-4% of all cancers with incidence of 10 per 100,000. Recent report shows an increasing oral cancer rate in some part of USA, especially in older white males. There was also a trend for African Americans to present with late disease stage compared with white Americans. Furthermore, African American male have a poorer 5-year relative survival rate compared with other races. The racial differences were attributed to health care access, public education, and socioeconomic, cultural, or biologic issues.(18)

Study in Europe suggest that, incidence rates have shown a growing trend in recent decades, at 7 per 100,000 between 1975 and 1989 increasing to 10 per 100,000 in 2005, an increase of 41% since 1989. Female oral cancer rates have remained much lower than that of males, but the incidence trend is similar with an average increase of 2.7% each year. When oral cancer rates are analyzed by age group, the rates have halved for men older than age 80, remained stable for men age 60 to 70 years, but increased markedly in men between age 40 and 60 years. For men between age 40 and 49 years, incidence has more than doubled from 3.6 to 9.2 per 100,000 and from 11.5 to 25.3 for men age 50 to 59 years. As with incidence trends, the mortality figures reflect the age-specific incidence trends with halving of the figures for men age 70 to 80 years, but a steady increase in mortality for men in their 40s, 50s, and 60s.(19)

Study on prevalence of head and neck cancers in the North East-India depicted that, the prevalence of head and neck malignancy was 54.48%. The commonest age group was 6th decade comprising of 31.13% and 22.8% cases were from the age group 40-49 years and 18% in 60 -69 years. In the gender distribution, male cases were far more common than female with 2.9:1 ratio.(20)

According to studies in Arab countries, prevalence of orofacial malignancy ranges from 1.8 to 2.3 per 100,000 persons. Oral cancer patients were mostly in their fifth to sixth decade of life, and the incidence in younger age was reported in some Arab countries. Yemenis have an alarming high prevalence of OC among people younger than 45 years.(21)

According to study on primary malignant head and neck tumors in Ghana: a survey of histopathological charts over two decade's shows male to female ratio of 1.84:1. This ratio was 2.63:1 for squamous cell carcinoma. The average age was 45.55 for male, 44.21 for female and 45.08 years for both sexes.(22)

A 10 years review of 1723 patients with histologically diagnosed primary malignant tumors of orofacial region at two hospitals in Harare Zimbabwe shows that, oral malignant neoplasms constituted 24.8% (n = 428). A male to female ratio was 1.9:1, with lesions being most common in the 41-60 years age group. SCC was most common in the 61-70 year age group.(23)

According to study in East African countries done at two Tanzania and Uganda hospitals, males were more affected by malignant tumors of orofacial region than females with ratio 1.3:1. The peak age for oral cancer was 6th decades.(24)

There is no published data specifically regarding the primary malignant lesions of oral and maxillofacial region in Ethiopia. But different studies show the prevalence of head and neck cancer in general.

According to study on the pattern of cancer in TikurAnbessa Specialized Hospital Oncology Center, head and neck malignancy was the 3rd commonest malignancy next to Gynecological malignancy and breast cacer and most of the patients were diagnosed at late stage of malignancy. It was also reported that head and neck malignancy was the most common malignancy see in male patients followed by sarcoma.(25)

Other unpublished 5 year retrospective study on primary malignant tumor of head and neck in Black Lion Hospital shows that, Head and neck cancers accounted for 9.72% of all malignancies. The male to female ratio of was 2:1.The mean age was 44.56 years with peak occurrence between 41 and 60 years comprising 40.5%. Most of the patients affected with malignancy of epithelial origin (carcinoma) were old adults (41-60 years). The age distribution for the lymphoma and sarcoma patients was in youngsters (≤21 years). Males are predominantly affected than female.(26)

Cause and risk factors

The global increase in an incidence of orofacial cancers is thought to be due to an increase in risk factors such as tobacco use and alcohol consumption.(9)Tobacco use has long been associated with the development of many malignancies. The risk of oral cancer associated with tobacco use is noted to be 2 to 12 times higher than in the nonsmoking population, and up to 95% of individuals with oral cancer will have a tobacco use history. The risk for oral cavity cancer development in nonsmokers is thought to be between 5% and 30%.(27)

According to study in UK, the upward trend of oral cancer in younger birth cohorts of men has been attributed to increasing levels of alcohol consumption. The role of smokeless tobacco has remained unresolved and there is no evidence that HIV disease has contributed to the rising incidence in young males.(19)

Study done in India shows that, high prevalence in this region is indicative of several factors that predispose to orofacial cancer. The use of tobacco, lime, betel and smoking is a very common oral habit prevalent in this region which may be one of the prominent causes.(20)
According to study done in Nigeria, Identified risks factors among head and neck cancer patients included: kola nuts, tobacco, farming, viral infections, alcohol and smoking. Kaposi sarcoma and salivary gland malignancy were the most common tumour in patients with HIV sero-positivity.(28)

According to study done in Ethiopia, 241 (31.88%) of the total 756 patients with primary head and neck malignancy, had history of exposure to known predisposing factors. Males showed higher predisposing factor exposure with 90.87% than females. From the total 241 patients with

history of exposure to risk, 137 (56.8%) were exposed to more than one predisposing factors. Grossly there were 140 (18.5%) cigarette smokers, 104 (13.8%) alcoholic, 165 (21.8%) Khat chewers, and 16 (2.1%) have HIV/AIDS. From a total 241 patients with risk exposure history 114 patients (69 cigarette smoking, 53 alcohol drinking, 90 chat chewing, and 5 HIV/AIDS) were affected 21 with oral cavity and oropharyngeal malignancy.(26)

Site specific prevalence

An institutional study on prevalence of malignant orofacial lesions in Japan on 1809 patients show that, the tongue (40.2%) was the most common site affected, followed by the gingiva (32.7%), buccal mucosa (10.1%), and oral floor (9.0%). There were 6 cases of multiple intraoral cancers. On histopathological examinations, SCC (88.7%) was the most common type found, followed by adenoid cystic carcinoma (2.1%), and mucoepidermoid carcinoma (1.7%). Cases classified as T2N0 were the most common (32.1%), followed by T1N0 (21.4%), T4N0 (8.0%), and T2N1 (7.6%). Nonepithelial tumors, among which malignant melanoma was the most common type accounted for 1.8% of the tumors. The sizes of the nonepithelial malignant tumors ranged from 1.0 to 7.0 cm, with an average size of 3.7 cm.(29)

Of all primary orofacial malignant tumors, 90 to 95 percent are the squamous cell carcinomas. Squamous cell carcinoma is an invasive epithelial neoplasm with varying degrees of squamous differentiation and a propensity to early and extensive lymph node metastases, occurring predominantly in alcohol and tobacco using adults in the 5th and 6th decades of life.(30)

Malignant neoplasms of the major and minor salivary glands are rare, comprising approximately 3% of all head and neck malignancies. The estimated incidence is only 0.9 per 100,000 in the United States, but the rate increases with age, peaking at ages 65 to 74 years. Less than 5% of all salivary gland tumors occur in the pediatric age group; however, salivary gland tumors in children are much more likely to be malignant than those of adults. There is an interesting inverse relationship between the overall incidence of neoplasms by site and the percentage that are malignant. The most common malignancy is MEC followed by adenoid cystic carcinoma.(31)

Carcinomas of the nasal cavity and paranasal sinuses account for 0.2-0.8% of all malignant neoplasms and 3% of those occurring in the head and neck. When considering the

paranasalsinuses alone, 77% of malignant tumors arise in the maxillary sinus, 22% in the ethmoid sinus and 1% in the sphenoid and frontal sinuses. Squamous cell carcinomas are the commonest. Occupational exposure to wood dust, in particular to dust of hard woods such as beech and oak, is the main known risk factor for sinonasal cancer. The effect is present after 40 or more years since first exposure and persists after cessation of exposure.(32)

A 17 years review on the primary malignant tumors of orofacial region at Benghazi, Libya presents that tumors of epithelial origin were found in 160 patients (82%), followed by tumors of immune system, 22 (11%) and tumors of mesenchymal origin, 14 (7%). Malignant non-odontogenic tumors were seen in 194 patients (99%) and malignant odontogenic tumors were seen in 2 patients (1%). Among the epithelial tumors, squamous cell carcinoma (50.6%) was the most common neoplasm, followed by mucoepidermoid carcinoma (15%) and adenoid cystic carcinoma (8.7%).(33)

Study done in Harare Zimbabwe shows that, squamous cell carcinoma (73.1%) was the predominant oral malignancy with 21.1% occurring on the mandibular gingivae, followed by the tongue (20.5%) and floor of the mouth (18.5%). Lip was the least affected (3.3%). The remaining oral malignancies included Burkitt's lymphoma 4.7%; Kaposi's sarcoma 3.7%; osteosarcoma 2.6% and malignant melanoma (1.9%). Well-differentiated was the most common oral malignant neoplasm.(23)

A retrospective study done in Ethiopia on primary malignant tumor of head and neck at Black Lion Hospital shows that, oral cavity was the most commonly involved site. SCC (72%) was the most commonly diagnosed primary head and neck malignancy followed by adenocarcinoma (5.6%). Nearly 2/3rd of head and neck malignancy patients were diagnosed at late stage of their disease course (stage II and IV).(26)

Significance of the study

Malignancy is among the major cause of death worldwide and has become the second leading cause of death in adult population.A change in life style habits in addition to increasing population size and aging contributes to the rise of cancer burden in developing countries including Ethiopia. Furthermore, noncommunicable diseases including cancer are among health targets of the Sustainable Development Goals, however there are very few published literatures available so far on this particular topic. Thus, knowing the burden of primary malignant lesion of orofacialregions will help the government and policy makers in planning the needfora better care and management of the diseases. It may also draw public attention, thereby increasing awareness towards these diseases.

This study is aimed to contribute for the descriptive epidemiology of primary orofacial malignancy and moreover the data obtained will be used by public health worker and health planners as base line data. The overall result will also be used by other researchers to work on broader population and forward appropriate recommendations to responsible organ.

CHAPTER THREE

OBJECTIVES

General objective

- To assess the pattern and distribution of primary malignant lesions of the oral and maxillofacial region among patients who visited Jimma university medical center.

Specific objectives

- To assess the socio-demographic distribution of primary orofacial malignancy
- To determine the etiology and risk factors of primary orofacial malignancy
- To assess the site specific prevalence of primary orofacial malignancy
- To assess the histopathologic variant of primary orofacial malignancy

CHAPTER FUOR

METHODS AND MATERIALS

Study area

The study was conducted in Jimma University medical center, maxillofacial unit, Jimma town, Oromia regional state, south west Ethiopia. The Jimma University medical center is governed by Ethiopian Federal Ministry of Health (FMOH).The hospital provides services to 15 million people with 1600 staff's members, 32 intensive care units, and 800 beds. It is the biggest center where specialized clinical services are given to peoples from southwest part of Ethiopia. This hospital has been chosen for this study as it is among a few centers in Ethiopia where oral and maxillofacial surgery services are rendered. Jimma University medical center is a pioneer in starting oral and maxillofacial surgery residency. Currently it has three oral and maxillofacial surgeons.

Study period

The study period wasfrom July. 1/2015 to Jun. 30/2019

Study design

Retrospective study wasconducted on primary malignant lesions of the oral and maxillofacial region among patients who were treated at Jimma university medical center for the past five years.

Source population

All patients that have been treated atJimma University medical center, maxillofacial unit within a period of five years duration fromJuly. 1/2015 to Jun. 30/2019

Study population

All patients with primary malignant lesions of oral and maxillofacial region that have been seen and received treatment within a period of 5 years duration from July.1/2015 to Jun. 30/2019 atJimma University medical center, maxillofacial unit.

Inclusion criteria:

- All patients with biopsy diagnosed primary malignant lesions of the oral and maxillofacial region during given period

Exclusion criteria:

- Reports with doubtful or controversial diagnosis, and
- Benign tumors, cysts, skin cancers, and eye tumors

Sample size and sampling technique

Consecutive sampling of charts of patients seen at maxillofacial unitsduring July. 1/2015 to Jun. 30/2019 who were diagnosed as having primary malignancy of the oral and maxillofacial region

Sampling Procedures

From log book/registration books at maxillofacial units, the list of all patients seen during July. 1/2015 to Jun. 30/2019 and diagnosed as having primary malignancy of oral and maxillofacial region together with their chart number wascollected. Using their chart number, their chartswereretrieved from card room

Data collection

Medical records including relevant histopathologic results of all cases of primary orofacial malignancy were retrieved and results filled into the questionnaire.

Data wascollected using a well-structured checklist from medical records of patients treated with primary malignancy of orofacial region in the past 5 years atmaxillofacial unitsofJimma University medical center.

Data wascollected over a 10 days period by 6 data collectors being supervised by 2 supervisors. The data wascollected by dental internsunder supervision by oral and maxillofacial surgery residents. Prior to the data collection, training was conducted for the data collectors as well as the supervisors on the quality of data anticipated and the way of gathering data from medical records.

Variables

Dependent Variables:

- Orofacial malignancy

Independent Variables:

- Sex
- Age
- Alcohol
- Khat chewing
- Histopathology features
- Site or location of the lesion

Data quality control

The checklists werepre-tested on similar settings prior to the actual data collection by the data collectors. The necessary adjustments weremade after the pre-test. At the end of each day, the collected data were checked by the supervisors for the completeness and corrections were made. The principal investigator was made blind to the raw data prior to the analysis.

Data processing and Analysis

The collected data was cleaned, coded and entered to SPSS version 20.0 windows software computer program for analysis. Frequencies, percentages, cross tabulation, of different variables were determined. The collected data were presented using figures and tables.

Ethical Consideration

Ethical clearance wasobtained from Research and Ethics Committee of Jimma University and permission obtained from Jimma University medical center board before the studywas conducted. Patients' names were not recorded on the checklist to guarantee confidentiality of the information.

Dissemination of Results

The finding of this study will be submitted to Jimma university postgraduate office, college of medical science department of oral and maxillofacial surgery school of dental medicine, jimma university medical center

Limitation of the study

The required information'swere not complete since the study was based on secondary data. There was a missing of history sheet, biopsy paper and radiographs. Some of the patient's cards were left at old card room and couldn't be found.

Operational definition

Primary oral and maxillofacial region malignancy: in this study primary oral and maxillofacial malignancy includes those malignant lesions that arise from the epithelial, mesenchymal and hemato-lymphiodsin the orofacialregions based on WHO disease classifications.

CHAPTER FIVE

RESULTS

Characteristics of the study participants

The total number of primary oral and maxillofacial region malignant lesions seen at Jimma University medical center maxillofacial unit during this 5 year period was eighty four (84). Out of this, seven patients were excluded based on exclusion criteria because of incomplete data. The rest all 77 patients were analyzed.

According to this study the mean age of all patients was 47 (SD± 17.249, range: 12 to 85 years). Majority of patients were above the age of 40 years (61.1%) and only 11.1% were less than 20 years. The peak occurrence was between 41 and 60 years comprising 41.6% followed by patients in age group between 20-40 years (27.3%) (Table 1).

Table 1- Age distribution of primary OMFR cancer patientsat JUMC maxillofacial unit, 2019

Age (years)	Number	Percent
≤20	9	11.7
21-40	21	27.3
41-60	32	41.6
≥60	15	19.5
Total	77	100.0

Most of the patients affected with malignancy of epithelial origin (carcinoma) were old adults (41-60 years) with 34 affected patients followed by young adults (21-40 years) with 14 affected patients.The mean age of patients with carcinoma was 52 years (SD± 15.937, range: 17 to 85 years). The age distribution for the lesions of mesenchymalorigin (sarcoma) was younger thanthat of carcinoma.The mean age of patients with sarcoma was 30.71 years (SD± 12.863, range: 12 to 50years).Only 2 cases of lymphoma were found during these 5 years (Table 2)

Table 2- Age distribution of OMF cancer patients based on histological variants atJUMC maxillofacial unit, 2019

Age(years)	Histological variants						
	SCC	Osteosarcoma	MEC	ACC	Acinic cell carcinoma	Others	Total
≤20	1	2	3	-	-	3	9
21-40	6	7	3	3	1	1	21
41-60	24	3	2	-	2	1	32
≥60	7	-	6	1	1	-	15
Total	38	12	14	4	4	5	77

This study shows that from analyzed 77 patients, 68.8% (53) were male and the rest 31.2% (24) were female with male to female ratio of 2:1 (figure 1).

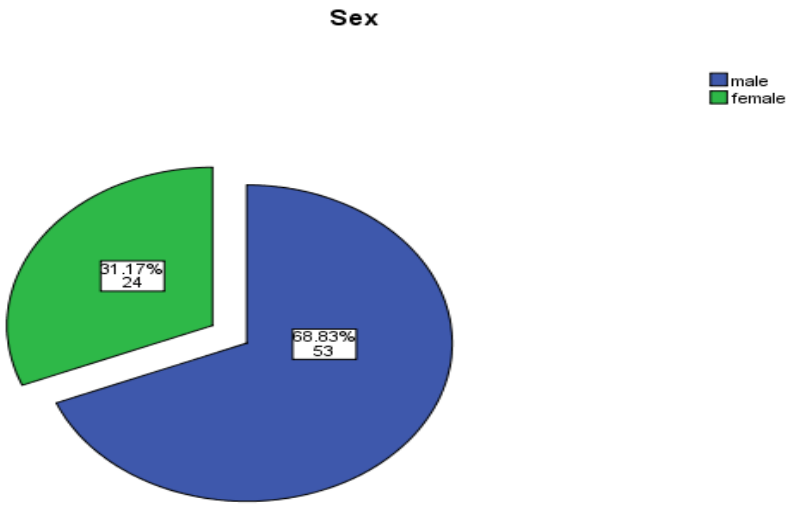

Figure 1. Sex distribution of primary OMFR cancer patientsat JUMC maxillofacial unit, 2019

Pattern of malignancies at various sites

According to this particular study, oral tongue was the most frequently involved site (19.48%) followed by the mandible (16.88%) and the maxilla (14.29%) (Figure 2).

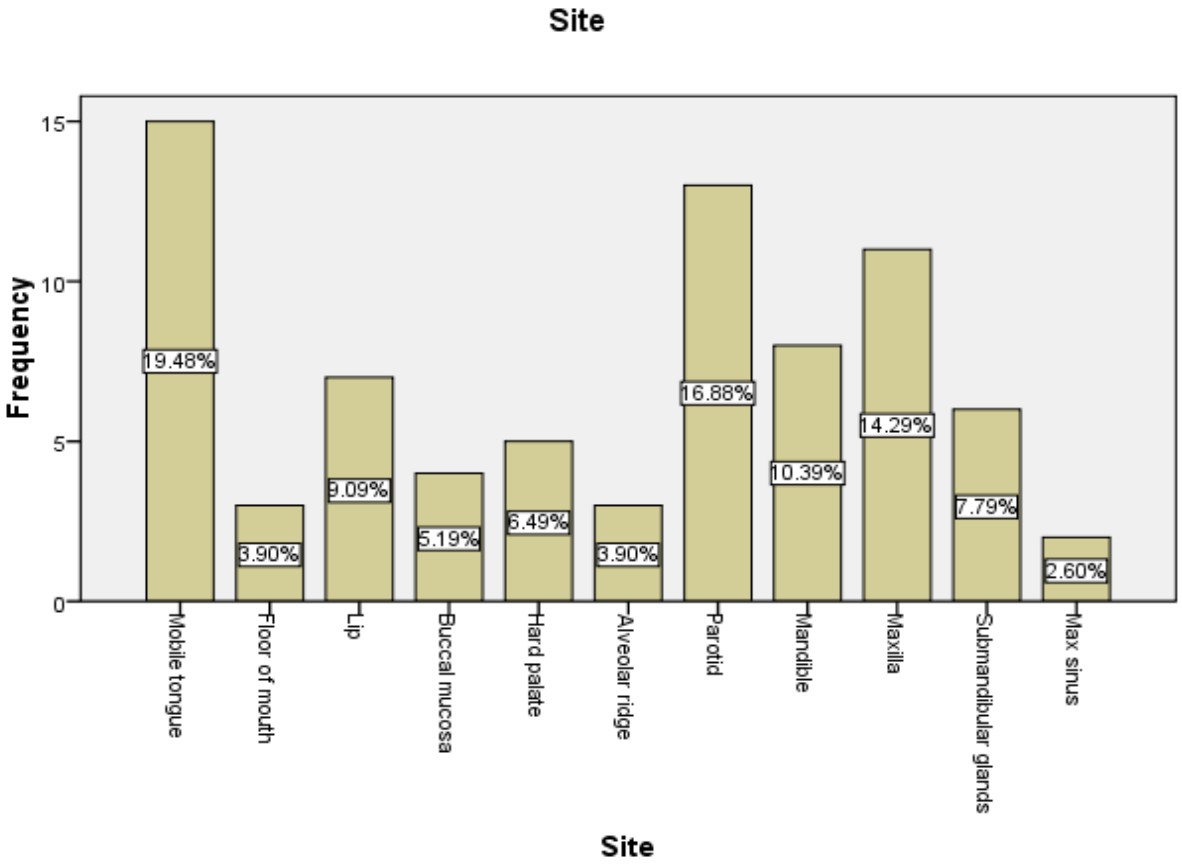

Figure 2: Distribution of primary OMFR cancer by the affected site at JUMC maxillofacial unit, 2019

Gender distribution of oral and maxillofacial malignancy is varying with involved subsite. With exception of cancers of buccal mucosa and alveolar ridge, all other subsites males are dominantly affected with a minimum male to female ratio of 2:1 in cancers of maxillary sinus and maximum of 15:1 in oral tongue malignancy (Table 3).

Table 3- Sex distribution by site of primary OMFR cancer patientsat JUMC maxillofacial unit, 2019

Site	Sex	
	Male	Female
Mobile tongue	12	3
Floor of mouth	3	1
Lip	5	2
Buccal mucosa	1	3
Hard palate	3	2
Alveolar ridge	1	2
Parotid	10	3
Mandible	5	2
Maxilla	8	3
Submandibular glands	3	3
Max sinus	2	-
Total	53	24

Histopathologic variants

According to this study, from a total of 77 primary oral and maxillofacial region malignancy patients, 60 (80%) were aroused from an epithelial origin (carcinoma) and 15 were from mesenchymal (sarcoma). Squamous cell carcinoma (SCC) was the most common specific histologicalfinding comprising of 49.35% of patients followed by mucoepidermoid carcinoma (MEC) 18.18 %. However, from the salivary gland malignancy,mucoepidermoid carcinoma constitutes the majority(73.68%) from a total of 19 salivary gland malignancies and adenoid cystic carcinoma comprises 21%(Table 4).

Table 4- Histologic variants of primary OMFR cancers at JUMC maxillofacial unit, 2019

Histologic variants	Frequency	Percent
SCC	38	49.4
Osteosarcoma	12	15.6
MEC	14	18.2
ACC	4	5.2
Acinic cell carcinoma	4	5.2
Lymphoma	2	2.6
Melanoma	1	1.3
Sarcoma	2	2.6
Total	77	100.0

Predisposing factors

This study shows that, out of the total 77 patients with primary oral and maxillofacial region malignancy, 52 (67.53%) had history of exposure to known predisposing factors. From the total 52 patients with history of exposure, 41 (53.2%) were exposed to more than one predisposing factors. Grossly there were 20 (26.0%) cigarette smokers, 4 (5.2%) alcoholics, 25 (32.5%) were Khatchewers and 3 (3.9%) were RVI patients (Table 5).

Table 5- Predisposing factors of primary OMFR cancers at JUMC maxillofacial unit, 2019

Predisposing factors	Frequency	Percent
Smoker	20	26.0
Alcohol	4	5.2
Khat Chewing	25	32.5
HIV	3	3.9
None	25	32.5
Total	77	100.0

There were a higher number of exposures to predisposing factor in males 77.36% with than females. (Table 6)

Table 6-Pattern of predisposing factor by sex of OMFR cancer patients at JUMC maxillofacial unit, 2019

Sex	Predisposing factor					
	Smoking	Alcohol	khat chewing	HIV	None	Total
Male	16	2	21	2	12	53
Female	4	1	4	1	14	24
Total	20	3	25	3	26	77

Size of primary malignant lesions

Most of the OMF region cancer patients 37 (48.05%) were diagnosed at T2 tumor size followed by T3 17 (22.08%) and T1 10 (12.08%). Figure 3

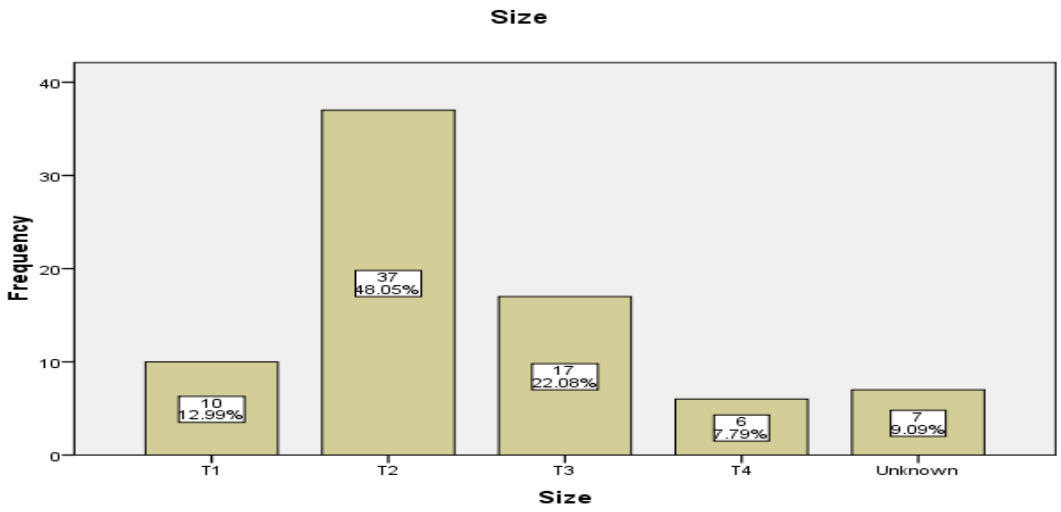

Figure 3-Tumor size of OMFR cancer patients on arrival at JUMC maxillofacial unit, 2019

CHAPTER VI

DISCUSSION

This study showed a male predominance with a male: female ratio of 2:1. This falls within the range found in Ethiopia, Tanzania, Uganda, Zimbabwe, India and Europe where a male to female ratio range from 1.3 to 2.63:1 (19,20,22,24,26). Various sites of oral and maxillofacial region show difference on male to female ratio. Primary malignant lesions of oral mucosain this studyfound a male to female ratio of 2.2:1 which is almost similar to worldwide estimation 2:1 but slightly higher than study done at Black Lion hospital 1.72: 1 (17, 26). With regard to salivary glands malignancies, our study showed 2.58:1 male and female ratio which is consistent with other study but different from study done at Black Lion hospital where there was almost equal sex distribution. (21, 26)A higher rate of history of exposure to predisposing factors (khatchewing, cigarette smoking and alcohol consumption) among male patients may be the explanation for these findings.

With regard to the age, this study shows that most of theprimary OMF regioncarcinomawere seen in older adults between the ages of 40 to 60 years 27 (41.6%). This is nearly similar to other findings in Zimbabwe, Ghana and Ethiopia but relatively low from those findings in Arab countries, Iranand India.Young adult patients between the age of 20 and 40 yearscomprises the second commonly involved age groups 27.3% which is also similar to study at Black Lion hospital but completely different from other finding in middle east and India in which old age groups (above 60 years) were the second frequently involved site. This difference may be attributed to the higher percentage of people below 40 years, lower life expectancy and early exposure to risk factors in developing countries. The mean age in this review was 46.66 years, which is similar to a study in Ethiopia with a mean age of 44.56 years and in Ghana 44.08 years. Younger patients (<20 years)were 11.1% inthis study, which is similar with a study done at Black Lion hospital 9.1% and Ghana. The incidence of these tumors is low among the persons younger population. Specifically sarcoma is higher among younger patientsless than 40 years which is almost universal and consistent among other studies(19, 2, 22, 26).

According to this study, the primary malignant lesions of mobile (oral) tongue was the most common sites involved 15 (19.08%)(Figure 1).Similarly, astudy on the anatomical distribution of head and neck malignant tumors in Ghana found the oral cavity to be the most common site for head and neck malignancies with a prevalence of 35.0% which is also similar to the findings in Arab countries, India and Ethiopia Primary malignancy of parotid gland was the second most common sites 11 (14.3%) this is somewhat different from the other studies where a cancer of floor of the mouth was the second commonly involved site(18, 19,21,26).

Most of the primary OMF region malignancies (80.5%) generally arose from epithelial origin or were carcinoma in this study and squamous cell carcinoma was the commonest histopathological tumor type (Table-5) as was found in Ethiopia, Ghana, Iran and several other studies (21,26,33). However, the percentage (80.5%) is higher inour study, when compared to 72.0% at Black Lion hospital, 49.6% found in Ghana and nearly similar with Iran finding which was 77.5%.Mucoepidermoid carcinoma was the second most common variant in this study followed by osteosarcoma unlike another reportwhere adenocarcinoma was the second most common specific histologic type in studydone at Black Lion hospital. The direct and immediate contact of predisposing factors to the epithelial tissue of OMF region may be the reason for highest prevalence of carcinoma than sarcomaandlymphoma.

This study shows that the 52(67.53%) of patients had a history of exposure to known predisposing factors. From these patients with a history of 79.0% were males and 45.2% had cancers of oral cavity. Most literatures mentioned cigarette smoking and alcohol drinking as independent factors for most of head and neck malignancies and our study result correlates with these literatures (19, 26, 27). Another additional predisposing factors ‘Khat’, which is a commonly used stimulant in Jimma area and also other parts of Ethiopia took the major part as predisposing factors than the others. This might be the reason for prevalence of OMF cancers in young adults.

According to this study, most of the patients 47(61.04%) were visited the center at earlier size of malignancy (T1 and T2) and only 38.9% were in higher size(T3&T4). This is unlike that study done atBlack Lion hospital where majority of patients visited the center at late stages (26). This may explained by health information given by community based education program by Jimma University students and easy health access around Jimma region.

Chapter VII

Conclusion and Recommendation

Conclusion

- Majority patients with primary OMF region cancersin this study were older adults and most of them were male with 2:1 male to female ratio
- Primary malignant lesions of oral tongue were the most prevalent site of OMF region
- Malignancy of epithelial origin (carcinomas) accounted for about two thirds of lesions in OMF region at JUMC maxillofacial unit
- Khat chewing and smoking were the more common predisposing factors in this study
- Squamous cell carcinoma was the most frequently seen histological variants in our study
- Majority of patients visited the center in earlier size of the lesion that T1&T2

Recommendation

A comprehensive effort is required from policy makers, nongovernmental organizations, and health professionals to identify the cause of these lesions at a broader population, increase awareness among peoples &provide easily accessible treatment options at the early stage of the disease.

The higher number of OMF region cancersas well as predisposing factors among young adults should be a major concern as it increases the risk of developing these devastating lesions and particular attention should be given for this age group by health professionals in minimizing predisposing factors.

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ANNEX I

Check list

Jimma University

Institute of health sciences

School of dental medicine

Department of Oral and maxillofacial surgery

This check list is designed to assess the distribution and pattern of primary malignant lesions of oral and maxillofacial region among patients who visited Jimma university medical center maxillofacial unit during period from Jan. 1, 2014 to Dec. 31 2018.

Read each part of the checklist carefully and write / tick "X" for appropriate response in the box provided accordingly

Date of registry: year ☐☐ **month** ☐☐ **day** ☐☐

Data collector ☐ **Supervisor** ☐

Card number ☐ **Code number** ☐

Part 1- Demographic data

1.1.Age (In years).....
1.2.Sex Male ☐ Female ☐
1.3.Date of visit/admission …../…../……..
1.4.Duration of the lesion

Part IIPredisposing factors

Tobacco smoking	☐
Alcohol	☐
Hx of exposure to radiation	☐
HPV	☐

Part III-Site specific distribution and size of the pathology

Affected areas: (primary Origin of the Lesion)

a) Oral tongue: ☐
b) Buccal mucosa: ☐
c) Floor of mouth: ☐
d) Alveolar ridge: ☐
e) Mandible ☐
- Anterior
- Posterior ☐

f) Maxilla
- Anterior ☐
- Posterior ☐

g) Salivary gland ☐
- Parotid ☐
- Submandibular ☐
- Sublingual ☐
- Minor Salivary gland ☐

h) Other…….

Size of lesion ……

Part V- Size of the lesion

T1	☐
T2	☐
T3	☐
T4	☐
Unknown	☐

Part -IV- Histologic variants of the lesion

1. General Histologic catagory:
   a) Epithelial tissues (Carcinoma) ☐
   b) Mesenchymal (Sarcoma) ☐
   c) Hematolymphoid (Lymphoma) ☐
2. Specific histologic variants
   a) SCC ☐
   b) Ameloblastic carcinoma ☐
   c) Primary intraosseous squamous cell carcinoma ☐
   d) Sclerosingodontogenic carcinoma ☐
   e) Clear cell odontogenic carcinoma ☐
   f) Ghost cell odontogenic carcinoma ☐
   g) Odontogenic carcinoma ☐
   h) Odontogenic sarcoma ☐
   i) Soft tissue sarcoma ☐
   j) Chondrosarcoma ☐
   k) Osteosarcoma ☐
   l) Lymphoma ☐
   m) Adenocarcinoma ☐
   n) ACC ☐
   o) MEC ☐
   p) Papillary Carcinoma ☐
   q) Other specify: (----------)

Assurance of principal investigator

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provisions of required progress reports as per terms and conditions of the institute of health sciences in effect at the time of grant is forwarded as the result of this application.

Name of student:……

Date:…….. Signature:

Approval of the advisor

Name of advisor:……..

Date: …….Signature: