A FOUR (2009-2012) YEAR AUDIT OF ORAL SQUAMOUS CELL CARCINOMA AMONG PATIENTS SEEN AT THE ORAL HISTOPATHOLOGY LABORATORY IN UNIVERSITY OF NAIROBI DENTAL HOSPITAL

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V28/1946/2010

A community dentistry project submitted in partial fulfilment of the award of the degree of Bachelor of Dental Surgery at the University of Nairobi

2013
DECLARATION

DECLARATION

I, Njenga Veronicah Wahu, that this is my original work and it has not been submitted to any other institution for award of any degree whatsoever.

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DEDICATION

This project report is dedicated to my parents and sister who supported me throughout the period of my study.
ACKNOWLEDGEMENTS

I am grateful to the God Almighty for strength and good health that He had provided me with. I also wish to express my gratitude to my two supervisors Dr. B.N. Mua and Dr. Elizabeth Dimba who ensured I was on the right track throughout the development and completion of this study.

I also thank family members, friends and classmates for their support throughout the study.
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<th>Description</th>
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<tbody>
<tr>
<td>OSCC</td>
<td>Oral squamous cell carcinoma</td>
</tr>
<tr>
<td>UON</td>
<td>University of Nairobi</td>
</tr>
<tr>
<td>UON DH</td>
<td>University of Nairobi Dental Hospital</td>
</tr>
<tr>
<td>KNH</td>
<td>Kenyatta National Hospital</td>
</tr>
<tr>
<td>BDS</td>
<td>Bachelor of Dental Surgery</td>
</tr>
<tr>
<td>TNM</td>
<td>Tumor Node Metastasis</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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</table>
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Figure 1: Frequency of cases diagnosed per year
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SUMMARY

Background: Oral squamous carcinoma arises from the mucosal epithelium when the squamous cells undergo mutation and begin to proliferate at an abnormally high rate and metastasize. Oral squamous cell carcinoma currently accounts for 85-90% of all malignancies on the oral region making it the major cancer in this area. Few studies have been done regarding the clinicohistopathological and socio-demographic features of OSCC in Kenya.

Objective: The objective of this study was to describe the clinicopathological features of OSCC among patients diagnosed with oral squamous cell carcinoma in the oral histopathology lab - UON Dental Hospital.

Study design: This was a retrospective descriptive cross-sectional study of patients’ clinical records diagnosed with OSCC from January 2009 to December 2012.

Setting: The study was conducted at University of Nairobi Dental Hospital oral pathology lab.

Materials and methods: Data was collected from the UON DH medical records and entered into a clinical form. This data included demographic details, clinical features and histopathological findings. Variables of interest included gender, age, primary site of the tumor, histological diagnosis. Data analysis was done using a SPSS version 16.0 and results represented in charts.

Results: A total of 181 records were included in the study. Of these, 106 (58.56%) were males and 75 (41.44%) were females. The number of males and females were almost equal in the 60-79 age group. The most commonly affected site was the tongue 52 (28.73%) followed by the buccal mucosa 21 (11.60%). Most of the lesions were ulcerated 132 (40.74%) at the time of
presentation, swelling was present in 106 (32.72%), tenderness in 49 (15.12%), bleeding in 23 (7.09%) of cases and a history of smoking in 14 (4.32%) of cases. Well differentiated OSCC was the most common histological diagnosis at 87 (48.07%) while verrucous carcinoma had the lowest finding 5 (2.76%)

**Conclusion:** OSCC had a higher incidence in males at 106 (58.56%) than females at 75 (41.44%). Most patients were in the 60-79 age group with 75 (41.89%) and the tongue was the most commonly site of occurrence with 52 (28.73%) cases. The most frequent symptom was ulceration at 132 (40.74%) records, at the time of presentation. Well differentiated OSCC was the most common histological diagnosis.

**Recommendations:** In order to get a representative sample, another study should be done regarding OSCC which includes a longer time study period in order to sample a larger population.
CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

1.1 INTRODUCTION
A neoplasm as defined by Willis is an abnormal mass of tissues, the growth of which exceeds and is uncoordinated with that of normal tissue and persists in the same excessive manner after the cessation of the stimuli which evoked the change [1]. Neoplasms can either be benign or malignant. Benign neoplasms are tumors that are localized to the primary site of occurrence and tend not to spread to surrounding or distant sites. Malignant neoplasms, however, invade surrounding tissues and metastasize to distant sites through the lymphatic system or bloodstream.

Oral malignancies/cancers include oral squamous cell carcinoma, sarcomas, salivary gland tumors, mucosal melanomas, lymphomas, metastases from other sites to the oral tissues.

Oral squamous cell carcinoma currently accounts for 85-90% of all malignancies on the oral region making it the major cancer in this area. It arises from the mucosal epithelium when the epithelial cells begin to proliferate at abnormally high rates, invading the surrounding tissues and spreading to distant sites, that is metastasis.

Several risk factors have been attributed to OSCC including tobacco particularly the smokeless types, alcohol, chronic exposure to the ultraviolet rays of sunlight, infections by Human Papilloma Virus 16, some preneoplastic conditions such as erythroplakia and leukoplakia, immunosuppression and some nutritional deficiencies. Consumption of tobacco and alcohol are thought to be synergistic and so increase the chances of developing OSCC in smokers than in non-smokers.
Diagnosis of OSCC is done by taking a good clinical history and careful examination of the patient but definitive diagnosis is made after a biopsy of the lesion is done. The clinician can obtain multiple biopsy specimens of suspicious lesions to define the extent of the primary disease and to evaluate the patient for the presence of possible synchronous second malignancies. Useful adjuncts include vital staining, exfoliative cytology, fine needle aspiration biopsy, routine dental radiographs and other plain films, and imaging with magnetic resonance imaging (MRI) or computed tomography (CT).

Management is based on the stage of the tumor. This includes both the clinical staging where various staging systems can be used for example the TNM staging system and histological categorization of the lesion. Treatment includes surgery to excise the tumor or surgical debulking to enhance the effectiveness of radiotherapy and chemotherapy. Rehabilitation is used to restore function after the cancer is removed.

OSCC is a major public concern, being a malignant tumor as it has a relatively rapid growth rate. It is therefore of utmost importance that it is diagnosed early so that treatment is effective in eradicating it. Hence people are advised to attend regular medical check-ups and screening tests. Educating the public is also essential on the symptoms they should watch out for which they should go to hospital for assessment and also to make lifestyle changes such as avoid tobacco use and reduce excessive alcohol consumption.

Few studies have been done in Kenya regarding OSCC hence this study therefore seeks to find out the clinicopathological and socio-demographic features of patients diagnosed with OSCC from January 2009-December 2012.
1.2 LITERATURE REVIEW

Oral squamous cell carcinoma accounts for 85-90% of all oral cancers, the rest being due to sarcomas, lymphomas, melanomas, salivary gland tumors and metastases from other sites [3]. Metastasis of squamous cell carcinoma is mainly through the lymphatic system and the vasculature.

1.2.1 Clinical presentation

The clinical presentation of oral squamous cell carcinoma varies. The lesions may ulcerated, exophytic, flat or raised (plaque-like) and are usually painless. A non-healing ulcer that has persisted for about 3 weeks should be viewed with a high index of suspicion. There may be induration and fixation of the underlying tissues. The margins of the lesion tend to be irregular. The colour of the lesions may be red (erythroplakia), white (leukoplakia) or combined red and white (erythroleukoplakia). The patient may also complain of difficulty in swallowing and chewing, inability to fully open the mouth, swollen cervical lymph nodes, tingling or numbness and alteration in speech. [2]

A study conducted by Bagan et al, in Spain concluded that pain was the most frequent presentation of OSCC. Initial stages showed erythroleukoplakia areas while in advanced stages, patients mostly presented with ulcers and lumps with irregular margins which were rigid on palpation [12].

A study conducted by Effiom O.A et al, in Lagos, Nigeria concluded that there was a higher incidence of OSCC in males more than females with a male to female ratio of 1.4:1. The peak incidence was found in 20-29 and 40-49 age groups. Males were significantly younger than females. [13]
1.2.2 Risk factors

Risk factors for OSCC include tobacco use and alcohol which are thought to be synergistic. Nutritional deficiencies for example vitamins A, C and E also play a role. Human papilloma virus subtype 16 is also a risk factor for OSCC. Immunosuppressed individuals are at a risk because immune surveillance is reduced hence the mutated cells which have foreign antigens are not destroyed hence continue proliferating.

A case control study conducted by Bundgaard T, et al, in 1995, concluded that tobacco and alcohol exposure were strong risk factors for developing oral cancer. Cases consisted of 161 consecutively admitted patients with histologically verified primary intraoral squamous cell carcinoma treated at the Aarhus University Hospital from January 1986 to November 1990. There were three controls for each case of the same gender and age randomly selected from non-hospitalized residents in the hospital’s catchment area. Risk was associated significantly with marital status, residence, dental status, alcohol consumption and tobacco exposure. It was found that tobacco and alcohol exposure were the strongest individual risk indicators and their combined effect was particularly strong [4].

Another study in a Kenyan population by P. Muange, in 2005, assessed 82 patients who presented with OSCC concluded that tobacco use was the main associated factor (73.2%) followed by alcohol use. The tongue was the most common site (35%), followed by the palate (22%) while the least commonly affected site was the floor of the mouth (10%). Majority of the patients presented with stage IV disease (52.5%) and on histopathological examination, poorly differentiated OSCC was most common (48.8%), followed by well differentiated (30.5%) and moderately differentiated OSCC (20.7%) [5].
1.2.3 Sites affected

Sites affected by OSCC include the tongue, the buccal mucosa, the retromolar trigone, the alveolar ridge and palate. A retrospective study conducted by Andisheh-Tadbrir A, et al in 2008, concluded that the tongue was the most commonly affected site (53%), followed by the buccal mucosa (9.5%) and the maxillary gingiva (9%). The male to female ratio was 1.4:1. The patients ranged between 4-87 years it was established that OSCC occurred most frequently in patients above 60 years. [6]

Majority of patients affected by oral cancers are above 40 years with 60-65 years being the average age at the time of diagnosis. Men are more affected than women as is reflected by the study above by Andisheh-Tadbrir A [2].

1.2.4 Staging

Staging of any tumor is important for any malignant tumor as it determines the type of management that is to done for the patient. The accurate size of the lesion should be noted before biopsy so as to properly stage the tumor. The Tumor-Node-metastasis (TNM) staging system of oral carcinoma is a commonly used criterion. [7]

The Tumor-Node-metastasis (TNM) staging system of oral carcinoma

- **Primary tumor size (T)**
  - TX: Primary tumor cannot be assessed
  - T0: No evidence of primary tumor
  - TIS: Carcinoma in situ
  - T1: Tumor 2cm or less in greatest dimension
  - T2: Tumor more than 2cm but less than 4cm in greatest dimension
  - T3: Tumor more than 4cm in greatest dimension
  - T4a: Tumor invades adjacent structures but is resectable
  - T4b: Tumor is unresectable

- **Regional lymph node involvement (N)**
  - NX: Nodes could not be or were not assessed
  - N0: No lymph node metastasis
N1  Metastasis in a single ipsilateral node 3cm or less in greatest diameter
N2a Metastasis in a single ipsilateral node between 3cm – 6cm
N2b Metastasis in multiple ipsilateral nodes none more than 6cm in greatest diameter
N2c Metastasis in bilateral or contralateral nodes none more than 6cm in greatest diameter
N3  Metastasis in a node not more than 6cm in greatest diameter

Involvement by distant metastases (M)
MX  Distant metastasis was not assessed
M0  No evidence of distant metastasis
M1  Distant metastasis is present

TNM Clinical Staging categories for Oral Squamous Cell Carcinoma

<table>
<thead>
<tr>
<th>Stage</th>
<th>TNM Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>T1N0M0</td>
</tr>
<tr>
<td>Stage II</td>
<td>T2N0M0</td>
</tr>
<tr>
<td>Stage III</td>
<td>TN0M0 or T3N1M0</td>
</tr>
<tr>
<td>Stage IV</td>
<td></td>
</tr>
<tr>
<td>IVA</td>
<td>T4aN0 or N1M0 or T1T2T3 or T4aN2M0</td>
</tr>
<tr>
<td>IVB</td>
<td>Any TN3M0 or T4b any N M0</td>
</tr>
<tr>
<td>IVC</td>
<td>Any M1 lesion</td>
</tr>
</tbody>
</table>

In addition to clinical staging of the tumor, a biopsy of the lesion, whether incisional (in large lesions) or excisional (in small lesions) has to be taken for histopathological evaluation. A diagnosis can then be made.

Based on histopathologic features Squamous cell carcinoma can be divided into:-

<table>
<thead>
<tr>
<th>Grade</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade I/low grade</td>
<td>Well differentiated</td>
</tr>
<tr>
<td>Grade II</td>
<td>Moderately differentiated</td>
</tr>
<tr>
<td>Grade III</td>
<td>Poorly differentiated/Anaplastic</td>
</tr>
</tbody>
</table>

The study mentioned above conducted by Effiom OA et al, found that poorly differentiated OSCC was the most common subtype (47.6%), followed by well differentiated (32.6%) and moderately differentiated (19.7%) subtypes.[13]
1.2.5 Management

Management of OSCC depends on the stage of the tumor and is usually multimodal. It involves surgery, radiotherapy and chemotherapy either for cure or for palliation. Surgery alone could be done for small lesions of the tongue, verrucous carcinoma and those involving bone due to the risk of radionecrosis [8]. Surgery is also indicated when there is poor response to or recurrence after radiotherapy or if bone is involved. Surgery includes wide local excision and neck dissection to remove malignancies in the lymph nodes that may metastasize. Reconstructive surgery accompanied by rehabilitation is used to retain or recover speech and swallowing function after the cancer is removed. Radiation therapy can be used to shrink the tumor prior to surgery or to rid the body of any microscopic remnants of cancer in the area where the tumor was found and removed. Chemotherapy treatments deliver drugs or hormones throughout the body and reduce the risk of the cancer spreading further or recurring. Chemotherapy is focused on specific areas as much as possible to improve effectiveness and reduce toxicity to normal parts of the body.

1.2.6 Prognosis

The survival rate of OSCC depends on the stage of the tumor at the time of diagnosis. The highest mortality rate is in the first two years after development of the tumor after which the mortality rate declines. 90% of males diagnosed with early-stage cancer survive the first year, 65% survive up to five years and less than 55% survive 10 years. Males who present with late stage cancers, less than 45% survive the first year, 16% survive five years, 12% survive 10 years. Hence the prognosis is relatively poor in advance disease. [8]

A retrospective study was done by Kademani D, et al, in 2005 to determine the outcome of patients with OSCC at a Legacy Emanuel Hospital, Portland by surgical resection with or
without adjuvant radiotherapy or chemotherapy and factors affecting survival and local and regional control of the tumor. 119 males and 123 females with an average age at diagnosis of 66 years met the criteria for inclusion in the study. Average tumor size was 2.35cm. Overall 5 year survival rate was 56% and disease free survival at 5 years was 58%. Stage and grade were found to be statistically significant effect on survival. The conclusion made was that stage and grade of the tumor are independent factors useful in predicting survival in patients with OSCC [9].
CHAPTER 2: PROBLEM STATEMENT, JUSTIFICATION, OBJECTIVES

2.1 Problem Statement
Oral squamous cell carcinoma accounts for 85-90% of all the tumors in the oral cavity making it the most common malignant tumor in the oral cavity. Prognosis of OSCC is usually poor because majority of patients present to hospital when the cancer is advanced.

2.2 Justification
The aim of this study was to describe the clinicopathological features of patients diagnosed with oral squamous cell carcinoma in the oral histopathology lab - UON Dental Hospital. In Kenya, few studies have been done regarding OSCC therefore there was need for studies to be conducted to provide doctors with current information regarding the disease. The information obtained can then be used to mobilize the public, via public health campaigns, to go for cancer screening which would help in saving many lives as some of these can be diagnosed early and successfully treated.

The study was conducted at the UON DH laboratory which is the largest dental teaching hospital in Kenya whereby most head and neck diseases are diagnosed and managed.

2.3 Objectives
2.3.1 General objective
To describe the clinicopathological features of patients diagnosed with oral squamous cell carcinoma in the oral histopathology lab - UON Dental Hospital
2.3.2 Specific objective

1. To determine the clinical presentation of the tumor at the University of Nairobi Dental Hospital.
2. To determine the most common sites affected by oral squamous cell carcinoma.
3. To determine the socio-demographic features of the patients in terms of age and gender.
4. To determine the most histological features of the OSCC.
CHAPTER 3: MATERIALS AND METHODS

3.1 Study Area
The study was conducted at the histopathology laboratory of the UON Dental Hospital. The UON Dental Hospital is located in Nairobi about 3 kilometres from the central business district. UON Dental Hospital serves as a training school for students undertaking various courses in dentistry as well as a referral hospital where head and neck diseases, injuries and neoplasms are diagnosed and managed. The histopathology laboratory is where diagnostic tests such as biopsies are analyzed and interpreted.

3.2 Study Design
This was a descriptive cross-sectional study of patients’ clinical records that were diagnosed with OSCC from January 2009 to December 2012.

3.3 Study Population
The study was conducted by reviewing the clinical records of patients who were diagnosed with OSCC at the UON Dental Hospital histopathology laboratory in the period from January 2009 to December 2012.

3.4 Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Gender: Male or female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age: In years</td>
</tr>
<tr>
<td>Independent variables</td>
<td>Primary site of the tumor</td>
</tr>
<tr>
<td></td>
<td>Clinical presentation</td>
</tr>
<tr>
<td></td>
<td>Histological diagnosis</td>
</tr>
</tbody>
</table>

3.5 Sample Size
The sample size included all clinical records of patients diagnosed with OSCC from between January 2009 to December 2012.
3.6 Sampling Method
No sampling method was used as all records of patients within the above given time frame were
be used.

3.7 Inclusion Criteria
The clinical records of patients diagnosed within the period: 1st January 2009 - 31st December
2012 and were complete were included in the study.

3.8 Exclusion Criteria
Any clinical record that was not within the period: 1st January 2009 - 31st December 2012 was
excluded from the study. Incomplete records were also excluded due to lack of adequate
information.

3.9 Data Collection Methods
Data was obtained from the UON DH medical records and entered into a clinical form. This data
included demographic details, clinical features of the tumor including the TNM classification
and histological findings. The variables of interest to be investigated were gender, age, primary
site of the tumor, histological diagnosis and when the diagnosis was made.

3.10 Ethical Considerations
Before carrying out the study, permission was sought by submission of the proposal to the
University Of Nairobi/Kenyatta National Hospital Ethics, Research and Standards Committee.
Permission was also sought from the UON DH administration to access medical records. All the
records were handled with confidentiality and only used for research purposes.

3.11 Data Analysis
Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 17.0
programme. The results are given in form of tables, graphs and text form.
3.12 Benefits Of The Study
This research provide current information regarding the clinical and histological features of OSCC which could be used to carry out public health awareness to educate the public on the symptoms to watch out for so that cases are diagnosed early and probably better survival rate.

Any future research in future may use information obtained in this study as baseline data.

This study is also submitted for partial fulfillment of the Bachelor of Dental Surgery, University Of Nairobi.

3.13 Study Limitations
Some records were missing while others were incomplete

Due to time constraints, this sample size was relatively small hence may not be reflective the general population
CHAPTER 4: RESULTS

4.1 Introduction

A total of 181 cases of patients diagnosed with OSCC were reviewed from 2009 to 2012. 53(29.28%) of the cases were seen in 2009, 59(32.59%) in 2010, 33(18.23%) cases in 2011 and 36(19.88%) cases in 2012. There was a greater number of cases in the first two years (2009-2010) than in the last two (2011-2012).

![Figure 1: Frequency of cases diagnosed each year](image)

Figure 1: Frequency of cases diagnosed each year
4.2 Age And Sex Distribution
Figure 2 shows the sex distribution between years 2009-2012. A total of 181 records were included in study. Of these, 106(58.56%) were for males and 75(41.44%) were females. The age range was between 18-99 years with a mean of 58.97 years and a mode was of 70 years. Among all the age groups, males (Mean 58.01 years) were slightly younger than females (Mean 60.37). Figure 3 shows the sex and age distribution of the participants. There were more males than females in all the age groups. The highest number of males was between 40-59 years, while the lowest was \( \leq 19 \). The cases of females were highest in the 60-79 age group and lowest in the \( \leq 19 \). The number of males and females were almost equal in the 60-79 age group. The highest number of cases including both males and females was in the 60-79 age group with 75 cases (41.89%), followed by 40-59 years with 61 cases (34.08%) and the least was \( \leq 19 \) with 1 case (0.56%).

![Sex distribution from 2009-2012](image)

Figure 2: Sex distribution from 2009-2012
Figure 3: Age and Sex distribution of the participants
4.3 SITE OF LESION
Figure 4 shows the distribution of the lesions by site. The most commonly affected sites were the tongue 52(28.73%) and buccal mucosa 21(11.60%). The least commonly affected sites were the angle of the mouth and the nasal region 1(0.56%). The tongue 37(34.9%) and palate 13(12.3%) were the most common affected sites in males while the tongue 15(20%) and buccal mucosa 11(14.7%) were more common in females.

Figure 4: Site of lesion
4.4 Clinical Presentation
Most of the lesions were ulcerated 132 (40.74%) at the time of presentation, swelling was present in 106 (32.72%), tenderness in 49 (15.12%), bleeding in 23 (7.09%) of cases and a history of smoking in 14 (4.32%) of cases. As shown in Figure 5 below, history of smoking was almost equal in males and females while tenderness was reported higher in females than males.

Figure 5: Clinical presentation
4.5 Histological Diagnosis
Well differentiated OSCC was the most common histological diagnosis 87 (48.07%), followed by 67 (37.01%), moderately differentiated 19 (10.49%). Verrucous carcinoma had the lowest finding 5 (2.76%). Generally males had higher levels in all categories of the histological diagnosis as shown in figure 6 below.

Figure 6: Histological diagnosis
4.6 Occurrence Of The Histological Diagnosis Between 2009-2010

![Bar chart showing occurrence of histological diagnosis from 2009-2012]

Figure 7: Histological diagnosis from 2009-2012

As seen in figure 7 above, generally well differentiated OSCC had the highest occurrence rate in all the four years except in 2012 where poorly differentiated OSCC had the greatest number of cases. Verrucous carcinoma had the lowest occurrence throughout all the four years which were studied.
CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion
The main objective of this study was to find out the clinicohistopathological features of oral squamous carcinoma among patients seen at UON DH. A total of 181 records were reviewed between 2009-2010. The highest number of cases were seen in the years 2009 and 2010 with 53(29.28%) and 59(32.59%) respectively, while 2011 and 2010 reported the least number of cases, 33(18.23%) and 36(19.85%) respectively. Hence a downward trend was noted. In 2009 (males to females 1.7:1) and 2010(males to females 2.0:1) there was a higher ratio of males to females which reduced to almost equal in the subsequent years 2011(males to females 0.8:1) and 2010 (males to females 1.1:1). A study done in Massachusetts General Hospital noted an increasing incidence of cell carcinoma of the head and neck among women [14].

There was a gender difference with more males 106(58.56%) than females who were 75(41.44%). This was equivalent to a male to female ratio of 1.41:1. This correlated with a similar study conducted in Lagos, Nigeria which also obtained a male to female ratio of 1.4[13].

Among all the age groups, males were more than females.

The age of the patients ranged from 18-99 years, with a mean of 58.97 years. The males (Mean 58.01 years) were slightly younger than females (Mean 60.37 years). This was however not statistically significant. The greatest incidence of patients was in the 60-79 age group which had 75(41.89%) cases while the lowest number of cases was in the ≤ 19 age group which had 1 case (0.005%). The results were similar to a study done in Mexico where a peak incidence of 62.5 years. However, a different study in Nigeria, found a peak incidence in the 20-29 and 40-49 age
groups [15]. Hence there was no consensus was arrived at as different studies had different age groups.

Based on the anatomic regions, the most commonly affected sites were the tongue 52 (28.73%) and buccal mucosa 21 (11.60%) while the least commonly affected sites were the angle of the mouth and the nasal region 1 (0.56%). In comparison to a study conducted in Lagos, Nigeria the tongue and the floor of the mouth had the highest occurrence [13]. However a different study carried out in Ibadan, Nigeria found that the maxillary (24.9%) and mandibular gingiva (21.5%) to be the most frequently affected sites [15]. Differences in the anatomic sites affected may be attributed to the differential behavior in the exposure to risk factors for example use of cigarettes, cigars, pipes and chewing tobacco. It has been suggested that the detection of age and site affected may be associated with pain and functional alteration. In tongue involvement, movement may cause discomfort hence may be diagnosed early. Sites such as the lip tend to present in advanced stages with symptoms such as pain hence long periods elapse before medical attention is sought.

Based on the histological diagnosis, well differentiated squamous cell carcinoma had the highest occurrence in all the four years except in 2012 where poorly differentiated OSCC has the greatest number of cases. 87 (48.07%), followed by poorly differentiated 67 (37.01%), and moderately differentiated 19 (10.49%). Verrucous carcinoma had the lowest finding 5 (2.76%). Generally males had higher levels in all categories of the histological diagnosis. These results were different from a similar study which found that poorly differentiated OSCC (47.6%), had the highest incidence, followed by well differentiated (32.6%) and moderately differentiated (19.7%).[13]
Results on the clinical presentation showed that most lesions were ulcerated 132 (40.74%). Swellings were present in 106 (32.72%), tenderness in 49 (15.12%), bleeding in 23 (7.09%) of cases and a history of smoking in 14 (4.32%) of cases.

5.2 Conclusions
Based on the findings of this study, it was concluded that:

1. OSCC had a higher incidence in males than females.
2. Most patients were in the 60-79 age group.
3. The tongue was the most common site of occurrence.
4. The most frequent symptom was ulceration with 132 (40.74%) records at the time of presentation.
5. Well differentiated OSCC was the most common histological diagnosis.

5.3 Recommendations
Based on the findings of this study the following was recommended:

1. Another study should be done regarding OSCC which includes a longer time study period in order to sample a larger population.
REFERENCES

[1].Kumar, Abbas, Fausto & Mitchell, Robbins Basic Pathology, 8th Edition, Chapter 6, page 174


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APPENDIX

A FOUR YEAR AUDIT (2008-2012) OF PATIENTS WHO PRESENTED WITH ORAL SQUAMOUS CELL CARCINOMA IN UON DENTAL HOSPITAL

DATA COLLECTION FORM

<table>
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<th>Sex of patient</th>
<th>Site of primary tumor</th>
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