

Oral Squamous Cell Carcinoma: A Clinicopathologic Review of 233 Cases in Lagos, Nigeria

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Purpose: The aim of this study is to present the clinicopathologic characteristics of histologically diagnosed squamous cell carcinoma (SCC) of the oral cavity in Lagos, Nigeria, with a view toward analyzing the age, gender, site distribution, and histological differentiation.

Patients and Methods: All cases that were histologically diagnosed as SCC of the oral cavity between January 1995 and December 2005 were retrieved from the records of the Department of Oral Pathology and Biology, Lagos University Teaching Hospital and the Oral Pathology Service, Lagos State General Hospitals. All the cases were subjected to analysis of age, gender, site of occurrence, symptoms at presentation, and histological differentiation of tumors.

Results: Oral SCC constituted 10.8% (n = 233) of the 5,124 biopsy specimens obtained in all of the centers during the study period. The mean age ($\pm$ standard deviation) of patients at presentation was 45.3 ± 19.6 years (range, 3 to 86 years), with a male:female ratio of 1.4:1; 40% of these patients were under age 40 years. Peak incidence was found in the 20 to 29-year and 40 to 49-year age groups. Males were significantly younger than females ($P = .00$). Poorly differentiated SCC was the most common subtype (47.6%), followed by well-differentiated (32.6%) and moderately differentiated (19.7%) subtypes. The mandibular gingiva was the most commonly affected site (31.8%), followed by the maxillary gingiva (23.3%) and tongue (17.6%). The least commonly affected site was the floor of the mouth.

Conclusions: Oral SCC is most common in the mandibular gingiva and in males in our environment, with 40% of cases occurring in patients under age 40 years. The poorly differentiated subtype is the most common histological differentiation.

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Squamous cell carcinoma (SCC) is the most common malignant neoplasm of the oral cavity, with a global variation in its incidence.¹⁻³ It has been reported to account for 70% to 90% of total oral malignant neoplasms.²⁻⁴ The global variation in the incidence of SCC

has been linked to various sociocultural characteristics, major geographic differences in risk factors, differences in data collection, and the level of development of health services in various populations.^{2,5} SCC of the oral cavity is an age-related disease, with about

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90% to 95% of cases occurring in persons over age 40 years.^{6,7} The overall incidence of oral carcinoma (mostly SCC) in the population is only about 1 in 20,000; this rises to 1 in 1,100 in males age 75 years and older.⁸

Although the etiology of SCC is unclear, predisposing/etiologic factors that have been implicated include tobacco use; ingestion of alcohol, smoked foods, and very hot foods; viruses; and industrial pollution.^{5,8,9} Oral SCC has been widely reported in the literature; to date, however, there have been few such reports from Africa.^{2,10,11}

The aim of this study is to present the clinicopathologic characteristics of 233 cases of histologically diagnosed SCC of the oral cavity in Lagos, Nigeria, with a view toward analyzing the age, gender, site distribution, and histological differentiation and compare these findings with previous studies reported in the literature.

Patients and Methods

All cases that were histologically diagnosed as SCC of the oral cavity between January 1995 and December 2005 were retrieved from the records of the Department of Oral Pathology and Biology, Lagos University Teaching Hospital and Oral Pathology Service, Lagos State General Hospitals. Hematoxylin and eosin-stained slides were re-evaluated by 2 of the authors to confirm the diagnosis. All of the cases were subjected to analysis of age, gender, site of occurrence, symptoms at presentation, and histological subtypes of tumors. The lesions were histologically classified into well-, moderately, or poorly differentiated SCCs. Carcinomas of the maxillary antrum, nasopharynx, major salivary glands, and tonsils were excluded from the study.

Data were analyzed using SPSS for Windows version 12.0 (SPSS Inc, Chicago IL). Simple frequency charts, descriptive statistics, and tests of significance (*t* test and χ^2 test) were used as appropriate.

Results

A total of 2,154 biopsy specimens were recorded in the biopsy files of the Department of Oral Pathology and Biology, Lagos University Teaching Hospital and the Oral Pathology Service, Lagos State Government Hospitals over the study period. Of these, 233 specimens (10.8%) were diagnosed as oral SCC. The patient group comprised 134 males and 99 females, for a male:female ratio (M:F) of 1.4:1. The mean age ($\pm$ standard deviation) of the patients at presentation was 45.3 ± 19.6 (range, 3 to 86 years); 93 of these patients (40%) were under age 40 years. Peak prevalence was seen in the 20 to 29-year and 40 to 49-

Table 1. AGE AND GENDER DISTRIBUTION OF THE PATIENTS WITH SCC

Age, years	Male (M)	Female (F)	M:F ratio	Total (%)
0 to 9	3	0	3:0	3 (1.3)
10 to 19	2	4	3:1	16 (6.9)
20 to 29	27	14	1.9:1	41 (17.6)
30 to 39	22	11	2:1	33 (14.2)
40 to 49	22	20	1.1:1	42 (18.0)
50 to 59	20	12	1.7:1	32 (13.7)
60 to 69	15	10	1.5:1	25 (10.7)
70 to 79	9	20	1:2.2	29 (12.4)
80 to 86	4	8	1:2	12 (5.2)
Total	134	99		233 (100)

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year age groups, with a male predominance (Table 1). Males (mean age, 41.4 ± 18.3 years) were significantly younger than females (mean age, 51.0 ± 20.2 years) ($P = .00$). SCC was more common in males than in females in all age groups except in the eighth and ninth decades of life, which had male-to-female ratios of 1:2.2 and 1:2, respectively (Table 1).

The poorly differentiated SCC was the most common subtype in both genders (47.6%; M:F = 1.3:1), followed by the well-differentiated (32.6%; M:F = 1.2:1) and moderately differentiated (19.7%; M:F = 1.9:1) subtypes. The most predominant histological subtype in all age groups was the poorly differentiated subtype (Table 2). There was no significance difference in patient age among the 3 histological subtypes (Fig. 1). Table 3 shows site distribution of SCC according to gender and histological differentiation. The mandibular gingiva (31.8%) was the most commonly affected site, followed by the maxillary gingiva (23.3%) and the tongue (17.6%). The least commonly affected site was the floor of the mouth. All of the sites except the mandibular gingiva and the cheek showed a male preponderance; SCC of the lip and floor of the mouth were seen predominately in males (M:F = 5:1 and 6.5:1, respectively) (Table 3). The poorly differentiated SCC was the most common histological subtype in all sites.

The record of primary clinical symptoms, available in 204 patients, revealed that 199 patients (85.4%) presented with painful/painless ulcerations or tumor masses. Less usual complaints of pain with multiple sinus discharges were recorded in 5 advanced cases (2.1%). The duration of symptoms before presentation ranged from 1 month to 9 months.

Discussion

Oral malignant neoplasms are the sixth most common malignancies worldwide and, together with ma-

Table 2. AGE AND GENDER DISTRIBUTION OF THE 3 HISTOLOGICAL SUBTYPES OF SCC

Age group, yrs	Well-Differentiated		Moderately Differentiated		Poorly Differentiated		Total (%)
	M	F	M	F	M	F	
0 to 9	0	0	1	0	2	0	3 (1.3)
10 to 19	3	1	2	0	7	3	16 (6.9)
20 to 29	9	6	7	3	11	5	41 (17.6)
30 to 39	10	2	2	2	10	7	33 (14.2)
40 to 49	6	5	6	5	10	10	42 (18.0)
50 to 59	7	5	2	1	11	6	32 (13.7)
60 to 69	3	4	6	2	6	4	25 (10.7)
70 to 79	3	7	2	2	4	11	29 (12.4)
80 to 86	1	4	2	1	1	3	12 (5.2)
Total	42	34	30	16	62	49	233 (100)

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lignancy of the pharynx, the third most common malignancies in the developing world.¹² Globally, the vast majority of malignant neoplasms (75%) occur in the developing world, with the oral cavity commonly the first or second most common site of malignancy.¹³ SCC is the most common malignant neoplasm of the oral cavity,^{1-3,8} accounting for 70% to 90% of total oral malignant neoplasms.^{2,4,8} Therefore, the problem of oral malignant neoplasia is primarily one of pathogenesis, diagnosis, and management of SCC originating from the oral mucosal surface.⁴

SCC constituted 10.8% of all biopsy specimens analyzed during the study period. This value is below the 20.8% previously reported from Zimbabwe² but higher than earlier reports of 1.2%¹¹ and 5.8%¹⁴ from Nigeria. The wide variation in frequency of SCC may be linked to varying sociocultural characteristics, differences in data collection methods, and the varying level of development of health services in the different populations.⁵ This variation also could reflect major geographic differences in risk factors.²

In the present study, SCC affected more males than females (M:F = 1.4:1), and the affected males were significantly younger than affected females. Male preponderance in oral SCC has been widely reported.^{2,3-5,11} The fact that male patients were younger than their female counterparts in the present study may be due to males' earlier exposure to carcinogens. A similar report on SCC of the oral cavity and lip in The Netherlands found that the mean age of onset in women was 7 years later than that in men.¹⁵ Remarkably, 40% of the patients in the present series were under age 40 years. This figure is at variance with reported figures of 4.5% in the United States,¹² 5% in Nova Scotia,⁶ and 18.4% in Zimbabwe² but similar to the 34.3% reported in Kuwait.¹⁶ In addition, the current study revealed that SCC was most common in the 40 to 49-year age group with another peak in the 20 to 29-year age group, with M:F ratios of 1.1:1 and 1.9:1, respectively.

This is a rather younger age group compared with other studies, which have reported peak incidences at 60 to 69 and 50 to 59 years^{6,17} and 51 to 60 and 41 to 50 years.² This discrepancy may be due to a shorter life expectancy in Africans and/or earlier exposure to risk factors.¹⁸ In Nigeria, the percentage of young people under age 40 years is much higher and life expectancy much lower in the general population compared with the United States.¹⁹ This may be responsible for the higher frequency of SCC in patients under age 40 years in the present study. Other factors may include exposure to as-yet unidentified carcino-

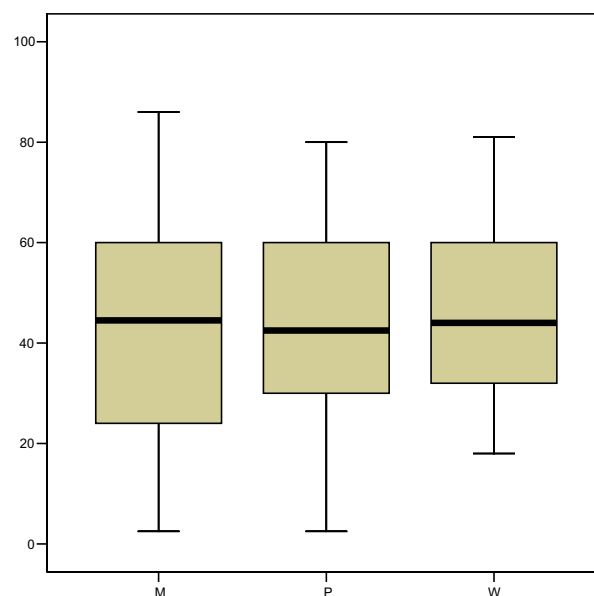


FIGURE 1. Boxplot comparative analysis of age of patients with well-, moderately, and poorly differentiated SCC ($P > .05$). Medians and quartiles are displayed in the boxplot; extreme values are represented by the horizontal lines outside the box (y-axis, age in years).

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Table 3. SITE, GENDER, AND HISTOLOGICAL SUBTYPES OF SCC OF THE ORAL CAVITY

Site Distribution	Gender		M:F Ratio	Histological Subtype			Total (%)
	M	F		Wd	Md	Pd	
Mandibular gingiva	32	42	1:1.3	28	13	33	74 (31.8)
Maxillary gingival	36	18	2:1	15	16	23	54 (23.2)
Tongue	25	16	1.6:1	13	13	15	41 (17.6)
Cheek	13	18	1:1.4	12	2	17	31 (13.3)
Lip	15	3	5:1	2	0	16	18 (7.7)
Floor of mouth	13	2	6.5:1	6	2	7	15 (6.4)
Total	134	99		76	46	111	233 (100)

Abbreviations: Md, moderately differentiated; Pd, poorly differentiated; Wd, well-differentiated.

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gens and poverty with associated immunocompromise. More research is needed to identify which risk factors may explain this phenomenon in the studied environment. The trend in the United Kingdom and United States is toward an increase in oral malignant neoplasia (largely SCC) in relatively young age groups.^{4,20,21} No carcinogen has been implicated for this changing trend; however, multifactorial agencies such as diet, oncogenic viruses and genetic predisposition may be involved.²¹ A comprehensive literature review of possible risk factors of oral carcinomas in young adults conducted by Llewelyn et al²² revealed that only few studies had reported a high proportion of heavy smoking and alcohol consumption among younger patients with oral carcinoma, with most of the studies finding no such association.

In the present series, the poorly differentiated SCC (47.6%) was the most predominant histological subtype in both genders, all age groups, and all sites, and the moderately differentiated type was the least common. This contrasts with recent studies reporting well-differentiated SCC as the most common and poorly differentiated SCC as the least common histological subtype in both genders, all age groups, and all sites.^{2,3} A previous study from 1 of the centers in the present study about 2 decades ago reported that almost half (47.2%) of cases presented histologically as well-differentiated SCC, and the poorly differentiated type was seen at a lower mean age.¹⁰ The reason for the apparent shift is not clear, and this trend should be investigated further. Although no significant difference in the mean patient age in the 3 histological differentiations in our series was found, Odukoya et al¹⁰ reported that the poorly differentiated subtype was seen at a lower mean age compared with the other types.

In agreement with other studies,^{2,3,10} the mandibular gingiva and the tongue were the most common sites of SCC predilection in the present study. This has been linked to carcinogens in tobacco, alcohol, or foods dissolving in saliva and tending to pool in grav-

ity-dependent areas of the mouth.^{2,4} However, in contrast to other studies,^{2,4} the least commonly affected site in the present series was the floor of the mouth. This may be due to the advanced state of the lesions at the time of presentation in some of our patients, coupled with the close proximity of the mandibular gingivae to the floor of the mouth, leading to difficulty in accurately determining the exact site of origin. The frequent involvement of the maxillary gingiva in our institution (23.2%) could point to some other etiologic factor apart from the traditional tobacco and alcohol.

SCC of the lip was relatively uncommon in this homogenous African black population. This is in agreement with previous studies showing a low prevalence of lip cancer in black patients.^{2,4,10,11,14} Deficiency of melanin has been suggested as a risk factor for lip SCC.^{2,8} The relationship between exposure to sunlight and lip cancer has been clearly shown in hot countries, such as Australia and the United States, with large immigrant, fair-skinned populations of European origin.^{8,17} In the United States, the risk of lip cancer approximately doubles for every 250 miles closer to the Equator a person lives.⁸ Remarkably, SCC of the lip and floor of the mouth were seen predominately in males (M:F = 5:1 and 6.5:1, respectively) in the present series.

In conclusion, our findings demonstrate that SCC constituted 10.8% of all biopsy specimens obtained during the study period. Oral SCC was most common in the mandibular gingiva and in males in our environment, and 40% of cases occurred in patients under age 40 years. The poorly differentiated type was the most common histological differentiation.

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