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Original Research Article

Histopathological pattern of orofacial lesions in reproductive age women in south-east Nigeria: A 10-year review

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Abstract

Introduction: Orofacial lesions significantly affect patients' quality of life and appearance. Women in the reproductive age are among those frequently affected, but the pattern of the lesions in this group is not well documented.

Aim and Objectives: The objective of the study was to determine the pattern of orofacial lesions in reproductive-age women among the patients who attended the University of Nigeria Teaching Hospital in South-East Nigeria.

Materials and Methods: This was a retrospective study of histological results of the orofacial lesions diagnosed between 2015 and 2024. The collected information included the patients' age, tumor/lesions' location and histological diagnosis. The data were coded and analyzed using Statistical Package for Social Sciences software for Windows version 29. $\alpha < 0.05$ was selected as the statistical significance threshold. Multivariate logistic regression models were used to assess the degree to which the age of patients was associated with the nature of the orofacial lesion.

Results: About one-third (33%) of orofacial lesions occurred in women of reproductive age. The benign conditions accounted for 68.7% of all lesions, while 23.6% were malignant. The most affected site was the mandible in 63.4%. Frequent diagnoses were ameloblastoma (77.1%), ossifying fibroma (19.0%), and squamous cell carcinoma (6.0%). The odds of younger women being diagnosed with benign lesions were 2.4 times higher than in older women (UOR 2.45, 95% CI 1.47–4.09).

Conclusion: The findings of this study indicate orofacial lesions are common among women of reproductive age in the Nigerian population, and majority of the lesions are benign.

Keywords: Nigeria, Orofacial lesions, Pattern, Reproductive-age women.

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1. Introduction

Orofacial lesions are a vast group of inflammatory, cystic, and neoplastic conditions (benign or malignant) that can affect any structure in the oral and maxillofacial region of the body, including but not limited to the jaw bones and related tissues.[1] Apart from differences in geographical distribution of these lesions, they tend to have different age and sex predilection, including affecting reproductive-age women.[1–4]

Traditionally, in most African societies, the reproductive-age women have been responsible for childbearing and nurturing, feeding, and caring for family members;[5] Hence, this group significantly impacts population dynamics and growth.[6] Moreover, the reproductive-age women contribute to the economic, educational, and political development of the society, and in the event they suffer from a debilitating illness, such as orofacial disease, the indirect cost to society is perhaps enormous.[5]

Orofacial lesions tend to significantly affect patients' quality of life and appearance, with the age and sex of the patients having a profound effect.[7] Women, especially young ones, tend to have more concerns about their body image and appearance, and any facial abnormality negatively impacts their mental health.[8] Notwithstanding this, there is scant literature on this topic and its impact on this important part of the population, not only in Africa but the world in general. Therefore, this study aimed to retrospectively determine the pattern of orofacial lesions in women of reproductive age among patients who attended the University of Nigeria Teaching Hospital in South-East Nigeria for 10 years.

2. Materials and Methods

After obtaining Ethical clearance from the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Enugu, Nigeria (NHREC/05/01/2008B-FWA00002458- 1RB00002323), a retrospective review of histopathological reports from 2nd January 2015 to 31st December 2024 was conducted. Inclusion Criteria were histopathological reports that had a final diagnosis indicating an orofacial lesion in women of reproductive age by WHO standards (i.e. 15 to 49 years). The reports with inconclusive diagnoses or without a final diagnosis were excluded.

The data of interest collected included the patients' age, tumor/lesions' location, histological diagnosis, and histological identification number. The post-operative result was used in cases where a patient had multiple results, such as one from

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a pre-surgery incisional biopsy and another from post-surgical excision of the lesion.

The data obtained from this study were coded and analyzed using Statistical Package for Social Sciences software (SPSS) for Windows (version 29, Armonk, New York: IBM Corp). The continuous variables were presented as the mean, standard error of mean (SEM), and percentages, while the categorical variables were presented in tabular form. The participants' age was grouped into 2 groups: the younger women (15–30 years) and the older women (31-49 years). The lesions were categorized per the 2022 WHO classification into benign, malignant, cystic, and inflammatory conditions. The location of the lesion was categorized as mandibular, maxilla, extraoral (parotid, skin, temporal region, neck, submandibular region, and lips), and intraoral (palate, buccal mucosa, tongue, floor of the mouth, and gingivae). The benign tumors were further grouped as odontogenic and non-odontogenic tumors. The malignant lesions were also grouped based on the cells of origin, thus carcinomas, sarcomas and lymphomas.

To assess the relationship between sociodemographic characteristics and the nature of the lesion, either One-way Analysis of Variance (ANOVA) or chi-square tests were used. The $\alpha < 0.05$ was selected for statistical significance. Multivariate logistic regression models were used to assess the degree to which the age of patients was associated with the nature of the orofacial lesion.

Written informed consent was obtained from each patient whose data were used, and assent was obtained from participants under the age of 18 years.

3. Results (Table 1,2,3,4)

3.1. The age distribution of the patients

During this survey, a total of 860 histopathological reports of patients with orofacial lesions were retrieved, amongst which 284 (33.0%) were of women in the reproductive age group. The mean age of the patients at the time of diagnosis was 29.82 (SEM = 0.61). Slightly more than half (N = 164, 57.7%) were younger women.

Table 1. *Distribution of study participants according to the anatomical location of the lesion and the histopathological nature of the disease.*

Anatomical location of the lesion	**Nature of the lesion**				
	Benign (N = 195, 100%)	Malignant (N = 67, 100%)	Cyst (N = 15, 100%)	Inflammatory (N = 7, 100%)	Total
Mandible	136 (69.7%)	33 (49.3%)	10 (66.7%)	1 (14.3%)	180
Maxilla	34 (17.4%)	15 (22.4%)	3 (20.0%)	2 (28.6%)	54
Maxillomandibular	1 (0.5%)	4 (6.0%)	-	-	5
Intraoral sites					23
Gingiva	8 (4.1%)	-	-	-	8
Tongue	4 (2.1%)	3 (4.5%)	-	-	7
Buccal mucosa	2 (1.0%)	-	-	1 (14.3%)	3
Palate	1 (0.5%)	1 (1.5%)	-	1 (14.3%)	3
FOM	1 (0.5%)	-	1 (6.7%)	-	2
Extraoral sites					22
Parotid	5 (2.6%)	1 (1.5%)	-	-	6
Submandibular	1 (0.5%)	5 (7.5%)	-	-	6
Cheek	1 (0.5%)	3 (4.5%)	1 (6.7%)	-	5
Lip	1 (0.5%)	-	-	2 (28.6%)	3
Neck	-	1 (1.5%)	-	-	1
Temporal	-	1 (1.5%)	-	-	1

NB: FOM= Floor of Mouth.

Table 2. *Overall distribution of patients according to age groups and the nature of the mandibular lesion.*

Nature of the lesion	**Mean age (years)**	**Age group**		**p-value**
		Younger	Older	
Benign	28.41	126 (76.8%)	69 (57.5%)	< 0.001
Malignant	34.03	26 (15.9%)	41 (34.2%)	< 0.001
Cystic	29.00	8 (4.9%)	7 (5.8%)	0.722
Inflammatory	30.71	4 (2.4%)	3 (2.5%)	0.947

Table 3. *Overall distribution of patients according to histological type of benign tumor and the age group.*

Histological diagnosis	**Age group**	
	Younger	**Older**
Odontogenic and Maxillofacial bone tumors		
Odontogenic tumors		
Ameloblastoma	58 (75.3%)	19 (24.7%)
Calcified epithelial odontogenic tumor	2 (40.0%)	3 (60.0%)
Adenomatoid odontogenic tumor	3 (100%)	-
Ameloblastic fibroma	3 (100%)	-
Odontogenic fibroma	3 (100%)	-
Calcified cystic odontogenic tumor	1 (100%)	-

Table 3. Overall distribution of patients according to histological type of benign tumor and the age group. (continued)

Histological diagnosis	Age group	
Other maxillofacial bone tumors		
Fibrous dysplasia	5 (71.4%)	2 (28.6%)
Ossifying fibroma	29 (53.7%)	25 (46.3%)
Myxofibroma	1 (25.0%)	3 (75.0%)
Bony exostoses	1 (100%)	-
Osteoma	1 (100%)	-
Central giant cell tumor	2 (66.7%)	1 (33.3%)
Florid cemento-osseous dysplasia	-	1 (100%)
Teratoma	-	1 (100%)
Salivary gland tumors		
Pleomorphic adenoma	5 (62.5%)	3 (37.5%)
Basal cell adenoma	1 (50.0%)	1 (50.0%)
Oral cavity and mobile tongue		
Squamous papilloma	1 (100%)	-
Pyogenic granuloma	6 (60.0%)	4 (40.0%)
Hemangiofibroma	-	1 (100%)
Lymphangioma	1 (100%)	-
Hemangioma	1 (50.0%)	1 (50.0%)
Focal papillary epithelial hyperplasia	1 (100%)	-
Others		
Neurofibroma	-	3 (100%)
Castleman's disease	1 (100%)	-
Schwanoma	-	1 (100%)

Table 4. Overall distribution of patients according to histological type of malignant tumor and the age group.

Histological diagnosis	Age group	
	Younger	**Older**
Carcinoma		
Squamous cell carcinoma	3 (17.6%)	14 (82.4%)
Ameloblastic carcinoma	11 (84.6%)	2 (15.4%)
Adenoid cystic carcinoma	-	4 (100%)
Basal cell carcinoma	-	2 (100%)
Adenocarcinoma	-	3 (100%)
Adenosquamous carcinoma	-	1 (100%)
Mucoepidermoid carcinoma	2 (100%)	-
Clear cell odontogenic carcinoma	-	1 (100%)
Ghost cell odontogenic carcinoma	1 (100%)	-
Epithelial-myoepithelial carcinoma	-	3 (100%)
Lymphoma		
Lymphoma	2 (50.0%)	2 (50.0%)
Sarcoma		
Osteosarcoma	6 (54.5%)	5 (45.5%)
Ewings sarcoma	1 (100%)	-
Rhabdomyosarcoma	-	1 (100%)
Fibrosarcoma	-	1 (100%)
Angiosarcoma	-	2 (100%)

3.2. Anatomical locations of orofacial lesions and their groups

A total of 13 anatomical locations were affected; the most affected sites were the mandible (N=180, 63.4%), followed by the maxilla (N = 54, 19.0%). The intraoral site was affected in 23 (8.1%) patients and the extraoral site in 22 (7.7%) patients; the remaining 5 (1.8%) patients had lesions affecting the maxilla and mandible synchronously. The frequently involved intraoral sites were the gingiva and the tongue, while the extraoral sites were the parotid and submandibular regions. (Table 1)

Of the four main groups in this study. Majority of the lesions were benign (N = 195, 68.7%), followed by the malignant ones (N = 67, 23.6%). Generally, all the lesions had a propensity for higher occurrence in the mandible. Except for the neck and temporal region, benign tumors affected all the anatomical locations. Malignant lesions affected many parts of the orofacial region, but notably spared the gingiva, the floor of the mouth, and the lip. The jaw bones (maxilla and mandible) were the only locations affected by all 4 groups of lesions. (Table 1)

3.3. Nature of the orofacial lesions and age of the patients

The mean age of patients at diagnosis was higher in malignant conditions and lowest for the benign lesions. There was a statistically significant association (p-value < 0.05) between the occurrence of benign and malignant lesions with the age group of the patients. (Table 2) The odds of younger women of be diagnosed with benign lesions were 2.4 folds higher than those of the older women (UOR 2.45, 95% CI 1.47–4.09), on the other hand older women of reproductive age had 175% higher chances of being diagnosed with malignant lesions compared to their counter parts (UOR 2.75, 95% CI 1.57–4.84).

3.4. The overall histological diagnosis of mandibular lesions

A total of 55 different histological diagnoses were made from the 284 tissue samples of lesions affecting women

of reproductive age. The most common lesions were ameloblastoma (N = 77, 77.1%) and ossifying fibroma (N = 54, 19.0%). Others were squamous cell carcinoma (N = 17, 6.0%) and ameloblastic carcinoma (N = 13, 4.6%).

3.5. The benign orofacial lesions

Table 3 shows the distribution of specific histological types of benign tumours in women of reproductive age according to the age groups. Ameloblastoma (N = 77, 39.5%), ossifying fibroma (N = 54, 27.7%), and pyogenic granuloma (N = 10, 5.1%) were the most prevalent benign lesions. Whilst ameloblastoma was the leading diagnosis in younger women, ossifying fibroma was the most frequent diagnosis in older women.

Benign odontogenic tumours were generally more prevalent in younger women (N = 70, 55.6%) while in the older women, non-odontogenic tumours were more prevalent (N = 47, 68.1%), and the difference in occurrence of these groups of lesions was statistically significant. Upon performing multivariate analysis, the chances of benign odontogenic tumors being diagnosed in younger women were almost 2.7 folds higher than in older women (UOR 2.67, 95% CI 1.44–4.95, p-value = 0.002).

3.6. The malignant orofacial lesions

Table 4 shows the distribution of specific histological types of malignant tumours in women of reproductive age according to the age groups. A total of 15 different histological types of malignant lesions were diagnosed. Squamous cell carcinoma (N =17, 25.4%), ameloblastic carcinoma (N = 13, 19.4%), and osteosarcoma (N = 11, 16.4%) were the frequently diagnosed malignant lesions. Ameloblastic carcinoma was the leading diagnosis in younger women, while in older women it was squamous cell carcinoma. The difference in the occurrence of various histological groups of malignant lesions by age group was statistically insignificant ($p \geq 0.05$).

3.7. Cysts of the mandible

Seven histological types of orofacial cysts were diagnosed in 15 cases. The most frequently diagnosed cysts were the odontogenic keratocyst (N = 6, 40.0%) and the radicular cyst (N = 3, 20.0%). There were only 2 cases (13.3%) of dentigerous cysts. Other cysts with a frequency of 1 each included the ranula, botryoid odontogenic cyst, odontogenic cyst, and epidermal cyst.

3.8. Inflammatory conditions of the mandible

Only 7 cases had a histological diagnosis of the inflammatory condition. Aside from sialadenitis (N = 2, 28.6%), the rest of the inflammatory conditions had a frequency of 1. These conditions included sinonasal polyp, chronic inflammation, fibroepithelial polyp, lichen planus, and pemphigus vulgaris.

4. Discussion

Orofacial lesions in reproductive age women represent a special challenge for patients, family members, and physicians since it has an impact on their social lives and the workforce.[9] This study is unique in its focus on the pattern of oral and maxillofacial lesions in this specific group of women. Information regarding the pattern of orofacial lesions in reproductive age women in general is scarce globally, hence, this study aimed to retrospectively determine the pattern of orofacial lesions among women of reproductive age who attended the University of Nigeria Teaching Hospital in South-East Nigeria.

The result of the current study indicates that almost a third of all biopsied lesions during the study period were in women of reproductive age, more than half of whom were less than 30 years old. Previous studies from Nigeria and elsewhere, although not specifically reporting on women of reproductive age, show that oral and maxillofacial lesions are common in young adults.[10–14] The high incidence of orofacial lesions among women of reproductive age is a public health concern that demands urgent attention, given the importance of this population group. Prioritizing women's health during this critical life stage is essential—not only for their well-being but for the broader social and economic health of communities. Thus, targeted health education, early screening programs, and accessible specialized care for this group are necessary.

In this study, multiple sites of the orofacial region were noted to be affected by orofacial lesions. with the osseous structures (maxilla and mandible) being predominantly affected. Similar findings have been reported from different studies globally.[10–15] The oral and maxillofacial region is one of the complex regions of the body, made up of vast anatomical structures, both osseous and soft tissue, with different embryological origins and potential to be affected by tumors and tumor-like lesions.[16] This is further supported by the results of this study, which identified over 50 distinct types of lesions in this region of the body.

In agreement with previous findings,[10,17–19] we found that benign lesions are the most common neoplasms, and the mandible is the most reported site. However, to the contrary, Alhindi et al., reported a higher incidence of inflammatory/reactive conditions in young women in Saudi Arabia, and Silva et al., reported a higher propensity of cystic orofacial lesions in a study carried out in Brazil.[20,21] The differences in the type of lesion between different studies can be attributed to several factors, including the sociocultural background and genetics of the population in the study setting, and study methodology. In most developing countries, oral lesions that are painless and do not bother the patients, such as inflammatory conditions, may be under-reported since patients tend to delay seeking medical attention, hence some of these conditions resolve with time.[12] Furthermore, certain lesions are treated based solely on clinical and radiographic findings, without submission for histopathological examination. Examples include leukoplakia, radicular cysts, odontomas, and periodontal cysts.[22]

Our results pointed towards 2.4 times higher odds of diagnosing benign lesions in younger women and an increase of 175% higher chances of being diagnosed with malignant lesions in older women. It has been hypothesized that since the genetic alterations in benign tumors occur early in life, the mutated cell multiplies as the patient grows, leading to early presentation of benign lesions.[12,23] Whereas malignant lesions arise due to the accumulation of genetic changes in cells that follow multiple steps for the development of a unique microenvironment, which may take time.[24]

From the results of the current study, benign odontogenic tumours were generally more prevalent in younger women, and the chances of benign odontogenic tumors being diagnosed in younger women were almost 2.7 times higher than those of older women. The odontogenic lesions are often derived from epithelial, ectomesenchymal, and/or mesenchymal elements of the tooth-forming apparatus.[25] Since these odontogenic tissues are more active during tooth development, which occurs in early life, these lesions may develop early and become apparent at younger ages.

Ameloblastoma and ossifying fibroma were the most prevalent benign lesions in this survey. This is in line with reports from other African studies,[7,26] but contrary to findings from elsewhere.[14,27–29] Since there is no conclusive evidence of a specific genetic predisposition to ameloblastoma or ossifying fibroma in Black populations, the higher occurrence of these lesions in African settings is more likely attributed to socioeconomic factors. Ameloblastoma and ossifying fibroma can grow significantly, leading to pronounced facial deformities and impaired function, which often drives patients to seek medical attention, unlike smaller lesions such as odontomas, which may remain asymptomatic.

Squamous cell carcinoma, ameloblastic carcinoma, and osteosarcoma were notably the most common malignant orofacial lesions among women of reproductive age. Generally, carcinomas are the most predominant group of orofacial lesions because they arise from epithelial cells, which are found in various tissues in the orofacial region.[10,30,31] About a quarter of all biopsied lesions in women of reproductive age in this study were malignant conditions, and this raises an alarm. Though the exact reason for an increase in early-onset orofacial potential is not clear, however, the influence of environmental, dietary, and genetic factors cannot be ruled out. These findings call for early malignancy screening programs to improve detection and treatment strategies.

Our study had some limitations. First, this being a retrospective study of histological reports, full clinical details of the patients, such as medical history, patients' risky behavior history, clinical presentation of the lesion, and patients' prognosis, could not be obtained. Another limitation of this study is that it was conducted at a single center, thus limiting the generalizability of the findings to the whole Nigerian population. Despite its limitations, this pioneering study provides important insights into oral and maxillofacial lesions among women of reproductive age. The findings have the potential to facilitate earlier diagnosis and more effective treatment, thereby improving the overall quality of life for this population group. Moreover, the study establishes a basis for future multi-center research aimed at further exploring this area.

5. Conclusion

This study reveals a considerable burden of oral and maxillofacial lesions among women of reproductive age in the Nigerian population. This group was found to be affected by a wide spectrum of lesions, with a significant proportion being benign. The jaw bones were the most involved sites. While Squamous cell carcinoma was the most frequently diagnosed malignant lesion, ameloblastoma and ossifying fibroma were the most commonly biopsied benign tumors. There were a few cases of cystic and inflammatory conditions.

6. Authors Contributions

1. **Uchenna Okechi:** Study conception and design, protocol development, data collection, manuscript writing/editing.
2. **Karpal Singh Sohal:** Study conception and design, protocol development, data analysis, manuscript writing/editing.

7. Source of Funding

None.

8. Conflict of Interest

None.

9. Ethical Approval

Ethical approval for this study was granted by the Health Research Ethics Committee of the University of Nigeria Teaching Hospital, Enugu, Nigeria (Ref.No. UNTH/HREC/2025/05/4004) dated 26th May, 2025.

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