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Abstract

Introduction: Ageing is inevitable and there is a growing population of the elderly group globally due to improved sanitations and quality of life. The effects of ageing associated with disease conditions including the oral cavity must be understood.

Objective: We aim to describe the pattern and distribution of oral problems of the elderly group according to the clinical and histopathologic diagnoses from the three major referral centres in South Western Nigeria.

Materials and Methods: A descriptive retrospective study was carried out using archived records of cases of elderly seen at the three institutions over a period of 35 years (1980-2015). Information about sex, age and histopathological diagnosis (categorized in non-neoplastic and neoplastic lesions) of participants older than 60 years was collected. Simple and relative frequencies of sociodemographic variables were calculated and comparison between variables was done using chi-square

Results: The study showed a female preponderance. Pyogenic granuloma 52(6.1%), ameloblastoma 46(5.4%) and squamous cell carcinoma 265 (30.9%), were the most prevalent inflammatory, benign and malignant lesion seen respectively.

Conclusion: Squamous cell carcinoma is the most common lesion seen in the elderly based on clinical and-histopathologic diagnosis. Further hospital-based studies and epidemiological surveys are needed to ascertain the prevalence of oral lesions in geriatrics in Nigerians.

Introduction

The normal aging process which is unavoidable requires a healthy body in which oral health occupies an imperative position. As persons age, changes both in physical appearance and metabolic processes occur. It is believed that this process reflects reduced metabolic activity and also the inability of distinct cells to replicate past a certain point[1]. Oral health care in the aged is therefore distinctive, as an extensive variety of oral health disorders/problems occur due to both the naturally occurring aging process and the incapability of the aged to provide ample dental hygiene care by themselves[2].

Some of the common oral disorders/problems which occur include dry mouth syndrome, tooth loss, oral candidiasis, utilization of nonfunctional partial or complete dental prostheses, chewing problems, root caries, periodontal disease, oral cancers and oral potentially malignant lesions amongst many others [2-4]. A variety of oral disease conditions associated with aging are usually complex and chronic in nature. They not only have a significant effect on diet selection but cause changes in nutrient intake, which may alter the quality of life[4]. Furthermore, certain chronic non-transmissible disorders such as cardiovascular disorders and diabetes mellitus observed to be prevalent disorders in the elderly may also have an effect on the oral mucous membrane[5-7]. In addition; the various drugs used for treatment of these conditions may produce certain side effects that frequently result in significant lifestyle changes and adaptations[8]. It is important that the dentist recognizes oral disease pattern among the elderly. This would result in the appropriate identification of oral health needs that would invariably influence the government to provide appropriate oral health policies that will appreciably benefit the Nigerian elderly population.

In 1984, the World Health Organization (WHO) established that a population aging> 60 years old should be considered an elderly population[9]. Nichols et al.,[10] also classified the elderly/aged into Old-old: for individuals ≥75years, old and Older: for individuals 60-74years old. Globally, the percentage of older people increased from 9% in 1994 to 12% in 2014, with an estimated expected increase of 21% by 2050[11]. In the year 2005, 4.9% of the Nigerian population consisted of elderly/aged persons ≥ 60 years old. With the population of Nigeria predicted to be the 4th most populous country globally, its estimated

elderly population may increase to 6% in 2025 and 9.9% in 2050[12] which would invariably have an impact on dentistry in Nigeria. Currently, geriatric dental expertise in Nigeria hardly exists. Clinicians specifically trained in geriatric dentistry are sparse and therefore insufficient to meet the predicted workforce needs. Adequate numbers of such specialist trained dentists are vital to ensure quality oral health care in the elderly.

Comparing oral disease across different regions may pose a challenge due to different classifications systems, different diagnostic criteria, and differences in accessibility as well as in the utilization of histopathologic services[13]. Nevertheless, extrapolations made from data may be useful in planning good health policies for a population. Previous studies based on clinical evaluation and clinic pathologic correlations have documented the pattern of oral disease in the elderly[14-26]. In Nigeria, the elderly population does not benefit from any specific social dental programs, thus there is limited information on the pattern of their oral disease[27]. We aim to elucidate the pattern and distribution of oral problems in the elderly hoping that data from this study would throw more light on their oral health needs and initiate the establishment of comprehensive oral health policies that would improve the quality of life of the elderly Nigerian population. In addition, data from this study would be useful in updating existing data in the scientific literature.

Materials and Method

An explorative study was carried out in University Teaching Hospitals in Lagos, Ibadan, and Ile-Ife which are foremost tertiary hospital centers in South –Western Nigeria where oral pathology services are available. Over a 35-year period (from years 1980-2015) all cases of properly documented oral diseases/ problems diagnosed among participants ≥ 60 years were identified and retrieved from the oral biopsy files of each center. Clinical and histopathologic data which consisted of a specific diagnosis of disease/ problem, age, gender, and anatomic site of the lesion were collected. Lesions were further categorized as non-neoplastic lesions (including vascular disorders, inflammatory processes, autoimmune conditions, and oral cysts) and neoplastic lesions (benign and malignant tumors, and pre-malignant conditions) according to the study by Corrêa et al 2006[21]. Data retrieved were analyzed with Statistical Package for the Social Sciences for Windows 21.0; Chicago, IL, USA (SPSS Inc.) and presented as simple frequency tables and proportions. The level of significance was set at $p<0.05$ to evaluate differences in the frequency of oral lesions in the groups.

Results

Over the 35-year period of review, a total of 37,210 oral and maxillofacial biopsies were diagnosed. Of these, 857 lesions were diagnosed among the participants aged ≥ 60 years (2.3%). There was a female preponderance (Figure 1) with a male to female ratio of 1:1.1 and a mean age of 68.1 ± 7.5 years. The mean age of males was 68.88 ± 7.99 while for females was 67.54 ± 7.07. There was a statistically significant difference in these mean ages ($t = 2.611$, $df = 855$, $p = 0.008$**).** The old age group (60-74 years) recorded a higher frequency 687 (80.2%) of biopsies in comparison to 170 (19.8%) biopsies recorded for the old-old age group (≥ 75 years) (Figure 1). In general, lesions had an anatomic site predilection for the jaws 360 (42%) with 217 and 143 cases from the mandible and the maxilla respectively, followed by the gingivae/alveolar ridge 162 (18.9%). (Table 1)

Malignant lesions (n = 435; 50.8%) were the most common lesions that occurred among the elderly (Table 2). The most common malignant lesion was squamous cell carcinoma (n = 265, 30.9%), while ameloblastoma (n = 46, 5.4%), and pyogenic granuloma (n= 52, 6.1%) were the most common benign and non - neoplastic lesions respectively (Table 3).

In the present study, the most common occurring lesions among the old age group (60-74 years) were the malignant lesions 328 (38.3%) followed by the non-neoplastic group 226(26.4%) (Table 4). Also, elderly male patients were observed to have more malignant lesions 227(26.5%) while females presented with more cases of non-neoplastic 177(20.6%) and benign 88(10.3%) lesions respectively ($p < 0.001$) (Table 4). Specifically, malignant (23.2%) and benign lesions (9.7%) showed site predilection for the jaws while non- neoplastic lesions showed gingiva site predilection (14.4%) (Table 4).

Figure 1- Gender and age distribution of participants

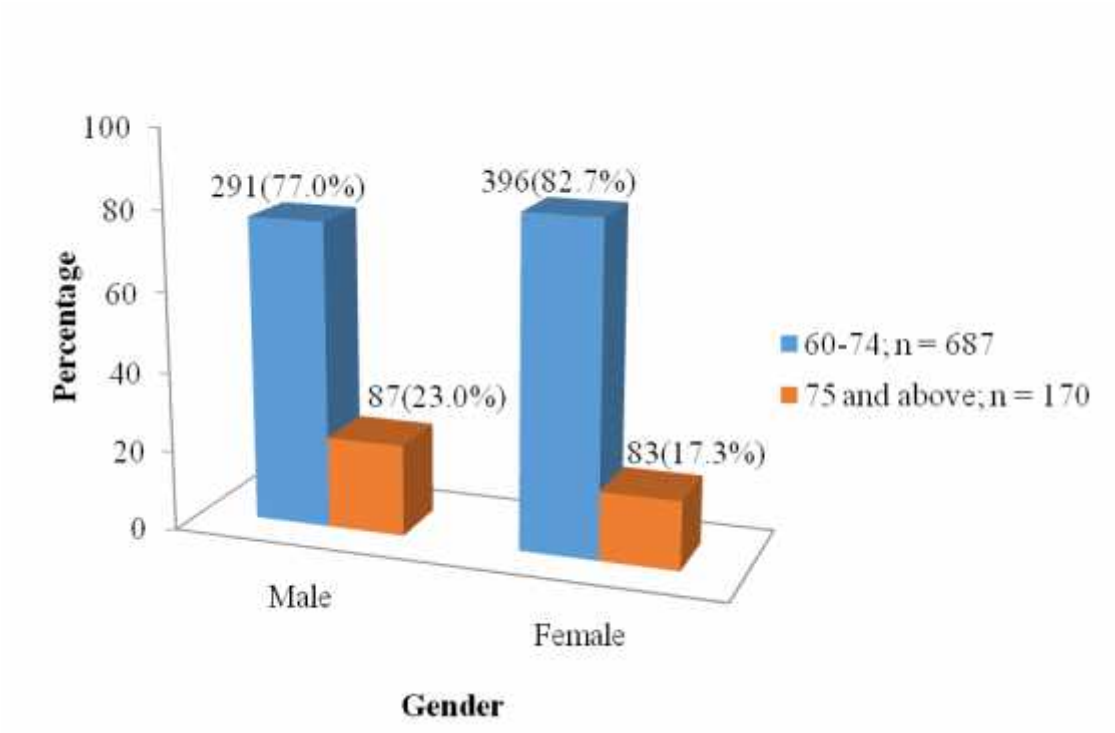

Table 1: Anatomic distribution of lesions in participants

Anatomic site	Frequency	Percentage %
Buccal mucosa	56	6.5
Gingivae/Alveolar ridge	162	18.9
Lips	31	3.6
Lymph nodes	12	1.4
Oral floor	27	3.2
Palate	91	10.6
Salivary gland	44	5.2
Skin	19	2.2
Tongue	55	6.4
Jaws	360	42.0
Total	857	100.0

Table 2: Distribution of the broad groups of lesions in participants

Histologic Type	Frequency	Percentage %
Non-neoplastic lesions		
Caries and periodontal lesions	9	1.0
Cysts	25	2.9
Infectious diseases	4	0.5
Inflammatory bone lesions	40	4.6
Inflammatory salivary gland lesions	15	1.8
Inflammatory/reactive lesions	181	21.1
Total (n)	274	31.9
Benign neoplasms		
Bone neoplasms	24	2.8
Odontogenic neoplasms	57	6.7
Salivary gland neoplasms	14	1.6
Soft tissue neoplasms	43	5.0
Total (n)	138	16.1
OPML		
Epithelial dysplasia	10	1.2
Total (n)	10	1.2
Malignant		
Bone neoplasms	7	0.8
Epithelial neoplasms	275	32.1
Odontogenic neoplasms	6	0.7
Salivary gland neoplasms	120	14.0
Soft tissue neoplasms	27	3.2
Total (n)	435	50.8

Overall Total (N)	**857**	**100.0**

OPML- oral potentially malignant lesions

Table 3: Distribution of the most frequently occurring lesions in participants

Histologic type	Frequency	Percentage
Non-neoplastic lesions		
Pyogenic granuloma	52	6.1
Chronic inflammation	46	5.4
Osteomyelitis	36	4.2
Fibrous epulis	25	2.9
Radicular Cyst	25	2.9
Epithelial hyperplasia	17	2.0
Peripheral ossifying fibroma	14	1.6
Others	59	6.9
Total	274	31.9
Benign		
Ameloblastoma	46	5.4
Ossifying fibroma	18	2.1
Pleomorphic adenoma	11	1.3
Lipoma	11	1.3
Fibroma	10	1.2
Others	42	4.9
Total	138	16.1
OPML		
Epithelial dysplasia	10	1.2
Malignant		
Squamous cell carcinoma	265	30.9
Adenoid cystic carcinoma	41	4.8
Mucoepidermoid carcinoma	26	3.0
Adenocarcinoma	20	2.3
Lymphoma	14	1.6
Others	69	8.1
Total	435	50.8
Overall Total (N)	**857**	**100.0**

OPML- oral potentially malignant lesions

Table 4: Association between age group, gender, anatomic site and histological diagnosis of the elderly group.

	Non-neoplastic N (%)	Benign N (%)	OPML N (%)	Malignant N (%)	χ^2	df	p value
Age group							
60 – 74years	226 (26.4)	126 (14.7)	7 (0.8)	328 (38.3)	18.548	3	<0.001
> 74years	48 (5.6)	12 (1.4)	3 (0.3)	107 (12.5)			
Gender							
Male	97 (11.3)	50 (5.8)	4 (0.5)	227 (26.5)	23.474	3	< 0.001
Female	177 (20.6)	88 (10.3)	6 (0.7)	208 (24.3)			
Anatomic site							
Buccal mucosa	13 (1.5)	10 (1.2)	2 (0.2)	31 (3.6)			
Gingivae	123 (14.4)	14 (1.6)	5 (0.6)	20 (2.3)			
Jaws	77 (9.0)	83 (9.7)	1 (0.1)	199 (23.2)			
Lips	7 (0.8)	6 (0.7)	-	18 (2.1)	237.863	27	< 0.001
Lymph nodes	6 (0.7)	-	-	6 (0.7)			
Floor of mouth	6 (0.7)	-	1 (0.1)	20 (2.3)			
Palate	16 (1.8)	9 (1.1)	-	66 (7.7)			
Salivary gland	8 (0.9)	7 (0.8)	-	29 (3.4)			
Skin	7 (0.8)	4 (0.5)	1 (0.1)	7 (0.8)			
Tongue	11 (1.3)	5 (0.6)	-	39 (4.7)			

OPML- oral potentially malignant lesions

Discussion

Various oro-facial disorders may be observed in elderly patients due to the complexity of systemic conditions associated with the aging process [8, 26]. Biopsy-based diagnosis provides a precise and final diagnosis of a lesion seen in a suspicious swelling, ulcer or white lesion, thus clinicians can offer the best type of treatment needed. Compilation of biopsy-based data provides important information on the prevalence of lesions that commonly affect a certain population. Moreover, the diseases reported in this study were considered serious enough to warrant a biopsy and further surgical interventions.

In this study, females were more prevalent in comparison to males. This is similar to results obtained in the studies by Correa et al., as well as Scott and Cheah which were based on biopsies and clinical diagnosis respectively [21,24]. Also, other surveys based on clinical diagnosis alone reported a higher female preponderance [28,29]. In this study, oral diseases were more prevalent amongst the elderly in their sixties (58%). This was lower than 63% and 71.4% recorded in the studies by Carvalho et al.,[25] and Correa et al.,[21] respectively.

The most common lesion in this study was oral squamous cell carcinoma (OSCC). Oral squamous cell carcinoma is a disease of adults and elderly [30]. This finding could be a reflection of the data sampled since the study areas are tertiary institutions which have the expertise to treat such malignancies. This, however, contrasts to other studies which recorded a predominance of benign lesions in their samples [21-24]. Nonetheless; many studies have shown OSCC to be the most common malignant neoplasm in the elderly [21,23-25].

Similarly, within the various groups of diseases, malignant lesions exhibited a significantly higher frequency than benign, non-neoplastic and potentially malignant groups of diseases ($p < 0.001$). Predictably, the most common lesion in the malignant group was OSCC since it's the most common lesion in this study, while ameloblastoma, pyogenic granuloma, and epithelial dysplasia were most common in their respective groups. These results are at variance with some previous studies where benign neoplasms were significantly more prevalent in older adults [18-25, 28,29]. These variations may reflect the geographical differences in presentation of oral lesions in the elderly. Adenoid cystic carcinoma, a salivary gland neoplasm was the second most common malignant lesion in this study. This finding is similar to the study by Carvalho et al. [25]. This, however, contrasts with studies by Muzyka et al.[23] and Correa et al.[21] who reported verrucous carcinoma and basocellular carcinoma respectively as the second most common malignancies in their study. The oral cavity is a well-known site for malignant lesions of both lining epithelium and glandular epithelium [17]. OSCC has a high morbidity and mortality rate [30] and its high prevalence shown in this study further emphasizes early diagnosis and management of OSCC cases.

Additionally, in this study, lesion classified as benign neoplasms recorded ameloblastoma, followed by ossifying fibroma as the two most common lesions in the group. These are benign lesions that mainly

affect young adults and are rarely seen in the elderly [31]. Pyogenic granuloma was the most common non-neoplastic/reactive inflammatory lesion seen in this study consisting of 29% of reactive lesions. The occurrence of this lesion may well be attributable to the poor oral hygiene seen in the elderly [32]. Premalignant lesions have also been reported to occur in the elderly [28,33] as ageing causes a gradual loss of protective function of the oral mucosa, exposing the oral mucosa to environmental insults. Epithelial dysplasia constituted 1.2% of all lesions in this series. Taiwo et al., in their study, also observed a low prevalence of pre-malignant lesions when compared to the developed countries [14]. This may be due to exposure to a different aetiologic factor, as there is a preference for Kolanut over tobacco in this clime [14].

This study presents an analysis of the cases submitted to three surgical pathology laboratories and describes the prevalence of oral lesions amongst specimens submitted for histopathology rather than the prevalence of oral lesions. While the cases in our files may not constitute the entirety of oral biopsies for the region over the study period, they probably do comprise the majority because these centers are the main oral pathology referral centres in the region.

Conclusion

The findings from this study have shown that OSCC is the most common lesion seen in the elderly based on histopathologic diagnosis. Further hospital-based studies and epidemiological surveys would assist in ascertaining differences in the presentation of oral lesions amongst geriatric patients in different climes.

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