Pattern of odontogenic tumours in Nigeria: a review of the literature

*** Akinmoladun VI, **Udeabor SE, *Arotiba JT**

Department of Oral & Maxillofacial Surgery, University College Hospital, Ibadan.
Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, University of Ibadan.

Correspondence: Udeabor SE
Email: samudeabor@yahoo.com

Abstract

Objective: Odontogenic tumours are lesions derived from the epithelial and/ or mesenchymal remnants of the tooth-forming apparatus. Various authors from different centres in Nigeria have at different times reported their experiences of the prevalence, clinical presentation and management of odontogenic tumours, but no effort till date had been made to harmonise all these works with a view to showing the true pattern of these tumours among Nigerians as a whole. This is what the present review article sets out to achieve.
Method: All articles published in Nigeria on odontogenic tumours from 1969 to date were reviewed. These articles were sourced from online stores using the PUBMED and HINARI. Manual search of the references in these articles was also done to identify additional relevant articles not listed in the above sites.
Result: Ameloblastoma was found to be the most reported odontogenic tumour, and has been described as the most frequently occurring odontogenic tumour in Nigeria. Although malignant variants of odontogenic tumours were well recognized, they were less reported in Nigeria than in the rest of the world. Peak age of occurrence for odontogenic tumours generally was between the 3rd and the 4th decades with variations in male to female ratio based on the type of odontogenic tumour. Mandible was found to be favoured more than maxilla as the common site of occurrence. Late presentation for treatment was a common phenomenon in all studies reviewed.
Conclusion: Odontogenic tumours remain a very common orofacial tomour in Nigeria and the literature is replete about studies from Nigeria. While large number of epidemiological studies exists, little efforts have been focused on management of patients to including challenges of reconstructive surgery and optimum prosthetic rehabilitation for improved outcome and quality of life.

Key words: Odontogenic tumours, literature review, Nigeria

Introduction

Odontogenic tumours are lesions derived from the epithelial and/ or mesenchymal remnants of the tooth-forming apparatus. They are therefore found exclusively in the mandible and maxilla but occasionally they may originate from the gingiva [(1)]. These tumours range from predominantly benign to few malignant variants.
The first published classification of odontogenic tumours by WHO was in 1971[(2)], it was later revised in 1992[(3)]. However, there were still controversies over terminology and categorization of certain tumours, hence in 2005, the WHO published an updated third edition for the definition and typing of these tumours [(4)].

Different centres in Nigeria have at different times reported their experiences of the prevalence, clinical presentation and management of odontogenic tumours, but no effort till date had been made to harmonise all these reports in order to present the true pattern of these tumours among Nigerians. This is what the present review article sets out to achieve.
It is note worthy that a good proportion of the Nigerian articles reviewed in the present study were based on the 1992 WHO classification.

Materials and method

All the publications in Nigeria so far on odontogenic tumours in all age groups that we could access as from 1969 till date were included in the review.
These articles were sourced from online stores using the PUBMED and HINARI. Manual search of the references in these articles was also done to identify additional relevant articles not listed in the above sites.
The articles were assessed for relative frequency of tumours, clinical features, age of occurrence, gender predilection, radiographic features and histopathology. Others were treatment prognosis; and recurrence. Number and sex distribution of tumour were also extracted and presented.

Results

Table 1 shows the author, study location, tumour type, age and gender distribution of odontogenic tumours reported in Nigeria from 1969 till date. The total number and gender distribution of the common tumours are presented in **Table 2.**

Table 1: Study location, tumour type, age and gender distribution

Author	Year	Location	Type of study	No. of patients	Type of tumour analysed	Population studied	Peak age	M:F ratio
Akinosi et al	1969	IB	R	76	Ameloblastoma	General	31.2	4:3
Daramola et al	1978	IB?	R	86	Ameloblastoma	General?	5-65	N/S
Daramola et al	1980	IB	R	22	Recurrent Ameloblastoma	General??	13-51	2:1
Adekeye et al	1980	KD	R?	109	Ameloblastoma	General	30.5	1.7:1
Sawyer & Mosadomi ?1985 et al Mosadomi et al		LAG & VIRGINIA (USA)	R	46-NIG 17-USA	Ameloblastoma	General	Nig-31.8 USA-39.4	1:1 1:2.4
Ajagbe et al	1987	IB	R	199	Ameloblastoma	General	32	4:3
Olaitan et al	1993	KD	R	315	Ameloblastoma	General	31.2	1.6:1
Arotiba J et al	1995	IB	R	13	AOT	General	23.3	1.2:1
Olaitan el at	1996	KD	R	30	Ameloblastoma	Children Adolescents	N/S	1.5:1
Arotiba G el at	1997	LAG, IB, KD	R	37	AOT	General	17.9	1:1.4
Arotiba J el at	1997	IB	R	128	Odontogenic Tumour	General	36	1.1:1
Olaitan el at	1998	KD	R?	26	Recurrent Ameloblastoma	General	33.7	1.7:1
Olaitan G el at	2000	KD, LAG	R	206	Ameloblastoma	General	20-29	M>F
Adebayo el at	2002	KD	R	78	Odontogenic Tumour	Children Adolescents	6-18	1:1
Ajayi el at	2004	LAG	R	92	Odontogenic Tumour	Children Adolescents	4-19	1:1
Adebiyi el at	2004	LAG	R	197	Odontogenic Tumour	General	8-85	1.4:1
Adebayo el at	2005	KD	R	318	Odontogenic Tumour	General	1-78	1.4:1
Arotiba G T et al	2005	LAG	R	79	Ameloblastoma	Children Adolescents	14.74	1.3:1
Ladeinde et al	2005	LAG	R	319	Odontogenic Tumour	General	29.9	1:1
Aregbesola et al	2005	IFE,LAG	R	146	Orofacial Tumours	Children Adolescents	2WKS-19YRS	1.4:1
Arotiba J T et al	2007	IB, Zaria	R	546	Odontogenic Tumour	General	30.8	1.2:1

Table 2: Total Number and sex distribution of odontogenic tumours reported in Nigeria from 1969 – date

Tumour type	Total Number	Male:Female
Odontogenic tumour	3075	1.3:1
Ameloblastoma	1754	1.5:1
Adenomatoid Odontogenic tumour	159	1.1:9
Odontogenic tumour in children	635	1.1:1
Recurrent Odontogenic tumour	69	1.9:1

Discussion

The literature is replete with studies from Nigeria on odontogenic tumours. Ameloblastoma was found to be the most reported odontogenic tumour, and has been described as the most frequently occurring odontogenic tumour in Nigeria. Although malignant variants of odontogenic tumours were well recognized, they were less reported in Nigeria than in the rest of the world. Peak age of occurrence for odontogenic tumours generally was between the 3rd and the 4th decades with variations in male to female ratio based on the type of odontogenic tumour. The mandible was found to be favoured more than maxilla as the common site of occurrence. Late presentation for treatment was a common phenomenon in all studies reviewed.

Relative frequency

Odontogenic tumours in general were found to occur quite commonly in Nigeria from the various studies analyzed in this review. Benign odontogenic tumours were found to occur more frequently than malignant variants in most of the articles reviewed[5-15]. Adebayo et al[10] in a review of 318 odontogenic tumours in Kaduna, Nigeria, recorded 99% to

be benign and only 1% to be malignant. This was similar to a review of 319 cases of odontogenic tumours in Lagos University Teaching Hospital, Nigeria, by Ladeinde et al[9] in which 96.6% were benign and 3.4% constituted malignant odontogenic tumours. All these are in agreement with studies in other parts of the world[16-20].

Studies in Nigerian children and adolescents revealed a near absence of these malignant variants of odontogenic tumours from this age group.[6,21,22].

All the studies reviewed had ameloblastoma as the most frequent benign odontogenic tumour. This agrees with 2 separate Asian studies in China[23] and Sri-Lanka[16] but contrasts with reports from the western world[18-20] which has odontoma as the predominant odontogenic tumour. Most odontomas are discovered on routine radiograph and do not produce clinical symptoms[24]. This may be responsible for the low incidence observed in African population, because most patients in our environment do not seek medical consultation unless there are symptoms suggesting a pathology.[9] Genetic and/ or environmental influences have also been suggested for the geographic variations[19].

Odontogenic myxoma was found to be the second most frequent odontogenic tumour after ameloblastoma followed by adenomatoid odontogenic tumour (AOT). [6-8,10,25] This is in consonance with studies outside Africa.[19-24] However, in a recent study in south western Nigeria, [9] in which odontogenic tumours were reviewed for a period of 23 years, AOT was found to occur more frequently than odontogenic myxoma. Asamoa et al [26] also reported AOT as the most frequent odontogenic tumour in Nigerian children.[9]

Ameloblastic carcinoma occurred more frequently than any other malignant variant of odontogenic tumours reviewed.

Clinical features

Age of occurrence

The peak incidence of odontogenic tumours was given to be third and fourth decades of life[8-10], though in one of the Nigerian studies, odontogenic tumours were recorded in both extremes, of life i.e. as early as 4years and also in an 85year old.[9] This compares with some non-African studies[16,23], where the age of occurrence varied from 3 to 84 years with a mean age of 32.1 years.

There was uniformity among the articles reviewed on the peak age of occurrence of ameloblastoma. This was found to be in the third decade of life[8-10,13,27,28].This was however not the case with calcifying epithelial odontogenic tumour (CEOT), in which there were variations in the age incidence as reported by the different authors. Whereas Ladeinde et al[9] reported third decade, Adebayo et al[10] gave sixth decade while Arotiba et al8 reported fourth decade. No reason could be adduced this variation, but it is of the authors' opinion that the rarity of this lesion could have been responsible. This is because none of the authors of the articles reviewed reported more than 3 cases of CEOT over several years and this could not have allowed for proper statistical analysis.

Adenomatoid Odontogenic Tumour (AOT) occurred mainly in the second decade of life, [8-10] as was the case with odontoma and squamous odontogenic tumour (SOT). Odontogenic myxoma, odontogenic fibroma and ameloblastic fibroma varied between the second and third decades of life.

The malignant variants of odontogenic tumours occurred mainly as from the fifth decade, although a case of malignant ameloblastoma was reported in the second decade in a study in south western Nigeria.[9]

Gender Predilection

There is no uniformity in the gender predilection of odontogenic tumours worldwide. Studies from Chile[19] Mexico[24] and Sri Lanka[16] gave female preponderance where as a male prediliction was reported by a Chinese study[23].

From the articles reviewed, ameloblastoma showed a greater male preponderance.[6-11) (13,27-29]. However, Arotiba et al[11] in a review of 79 cases of ameloblastoma in Nigerian children and adolescents reported a male to female ratio of 0.8:1 in patients younger than 14years. Whereas there were irregularities in gender predilection among other odontogenic tumours including the malignant variants, odontogenic myxoma showed a consistent higher female predilection [6,8-10].

Site of Occurrence

Odontogenic tumours generally were shown to occur more in the mandible than the maxilla from the articles reviewed, this is with the exception of AOT which occurred more in the anterior maxilla.[17, 30]. All these are in agreement with studies elsewhere outside Nigeria.[16, 19, 20]. However, Jing et al [23] in a retrospective study of 1,642 cases of odontogenic tumours in a Chinese population reported a maxillo-mandibular ratio of 1:1 for AOT.

Ameloblastoma was reported to affect mostly the anterior portions of the mandible.[31,33], one of the authours explained that oral sepsis and increased incidence of calculus deposition were the culprits[31]. This however contrasts with a recent study by Olaitan et al,[34] in which the body of the mandible was affected most.

Older literature tend to support the fact that ameloblastoma affects symphyseal area more than the posterior mandible in Nigerians and indeed Africans.[31,33].However, recent literatures with large number of cases show that although there is a higher frequency of anterior (symphyseal) ameloblastoma in Nigerians than the Caucasians, the overall most common site of occurrence is still the body of the mandible[35].

Clinical presentation

The main clinical presentations common to all odontogenic tumours as recorded in the articles reviewed are jaw swelling, pain and tooth displacement. Painful swelling was a common feature of ameloblastoma because most cases present late for treatment. Less common symptoms were oral ulcers, bleeding, and pus discharge. These symptoms lasted from a few months to several years. Adebayo et al[10] in a review of 318 odontogenic tumours in Kaduna, Nigeria, reported a case of CEOT which presented to the hospital after 34 years. This is usually so because of the socioeconomic situation, especially where the tumour is relatively asymptomatic. Even when symptomatic, many would have sought for alternative cheaper health solutions before presenting to the hospital.

Olaitan et al[34] in a study on the socio-economic status of patients with ameloblastoma of the jaws, reported the low income group as the most frequently affected, however in an earlier study in the same centre the middle income group had the highest incidence.[29]. No reason was however given for the socioeconomic disparity.

Radiographic features
Some of the articles reviewed did not give the radiographic features of these tumours, however, a few reported a higher incidence of multilocular radiolucent lesions as compared to unilocular radiolucent appearance of ameloblastoma. [8, 10, 11, 27-30]. The radiographic appearances of the other lesions varied from multilocular, to unilocular or a mixture of radioopacity and radiolucency which are in keeping with global picture[16, 17, 23, 36].

Histopathology
Follicular ameloblastoma was reported as the most frequent histologic variant of ameloblastoma followed by the plexiform type, while the basaloid type was the least frequently occurring variant[10,31]. Adebayo et al,[6] however reported the plexiform histologic type to be the most frequent variant among Nigerian children and adolescents. An unusual case of odontogenic carcinoma with dentinoid material presented a peculiar histologic picture and was reported in Lagos by Sawyer et al[37]. No report of the histopathologic typing of the other odontogenic tumours was available for review, suggesting that this was not usually done by the pathologists.

Treatment
Treatment of the various tumours ranged from simple enucleation, dentoalveolar resection with preservation of lower border (en-bloc resection) to segmental/ total resection of the jaw bone depending on the size and the histologic type of the tumour. However, resection appears to be the most common treatment due to frequent grostesque presentation.
Several methods of therapy, including curettage, enucleation, cauterization, jaw resection, and 'roentgenotherapy', have been employed in the past in the treatment of ameloblastoma[38]. In some cases, segmental resection was followed by immediate reconstruction with autografts and allelografts. In Ibadan, Nigeria, Arotiba et al[8] reported the use of iliac crest bone grafts, adapted Steinmann's pins, or Kirshner wires for reconstruction following various mandibulectomies and obturators for post-maxillectomy rehabilitation. None of the articles from Nigeria reported on temporomandibular joint reconstruction despite frequent disarticulation occasioned by late presentation.

Recurrence
Recurrences were reported to be commonly seen in ameloblastoma and fibromyxoma, although the true picture may not be ascertainable as many patients would not return for follow-up. Daramola et al[38] while reviewing twenty-two cases of recurrent ameloblastoma, argued that these recurrent lesions merely represented continued growth of residual tumour foci left behind as a result of an earlier, inadequate operation rather than true recurrence. This is because most of these lesions on presentation would have perforated the periosteum and invaded the soft tissues giving a high chance of recurrence despite wide tumour excision[38]. Nevertheless, a recurrence-free follow-up period of up to 9 years was reported by Olaitan et al[29] following treatment of ameloblastoma in children and adolescents[29]. Arotiba et al,[39] in a recent review of 546 cases of odontogenic tumours, reported maximal recurrence following simple enucleation with curettage, local excision, as well as post maxillectomy. Sawyer et al also reported peculiar cases of recurrence with ameloblastic fibroma [40].
The rate of recurrence in these studies might be underestimated as the median follow-up period was short and recurrences can develop as late as 30 years after operation[8]. Life time follow-up is therefore advisable for ameloblastoma and fibromyxoma[8].

Conclusion

Odontogenic tumours remain very common orofacial tumours in Nigeria with ameloblastoma most commonly reported. Late presentation and lack of adequate facilities for reconstruction of ensuing defect, following treatment have been among the numerous challenges facing the management of odontogenic tumours in Nigeria. These factors make the result of outcome less than optimum. Reports on long term follow up and outcome are rare and should be encouraged.
It was also observed that the studies analyzed in this literature review were mainly from the northern and south western parts of Nigeria. There is paucity of literature on odontogenic tumours from the south eastern and south southern parts of the country. This makes the present study an incomplete picture of odontogenic tumours in Nigeria as a whole.

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