ORIGINAL ARTICLE

Prevalence of mandibular and palatine tori among the Ibos in Enugu, South-East Nigeria

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Abstract

Context: Torus mandibularis (TM) and torus palatinus (TP) are believed to occur commonly among black Africans. There is a dearth of literature on Nigerians. The few reported studies were done in the South-West Nigeria. This is the first report of the prevalence of tori among the Ibo-speaking ethnic group in the South-East Nigeria.

Settings and Design: This is a prospective cross-sectional study of 3000 subjects of Ibo ethnic extraction attending a dental clinic in Enugu, South-East Nigeria.

Materials and Methods: Three thousand subjects were examined for the isolated and concurrent occurrence of TM and TP. The subjects were seen over a 4-year period. The age, sex, ethnic group, type of tori based on location, and symptomatic awareness of tori presence were documented.

Statistical Analysis Used: The data were analyzed with Statistical Package for Social Sciences (SPSS) version 17. The level of significance was $P < 0.05$. The Chi-square test showed no statistically significant difference between gender and type of tori ($P = 0.34$). Similarly, there was no statistically significant difference between the age groups and type of tori ($P = 0.38$).

Results: Two hundred and ninety-two subjects were clinically diagnosed with tori, of which females constituted 88%, and males constituted 12%. Isolated TM occurred in 56.8% (166 of 292) subjects, isolated TP in 17.5% (51 of 292) subjects, and concurrent tori (TM and TP) in 25.7% (75 of 292) subjects. The peak occurrence was in the fifth decade. The overall prevalence was 9.7%. The prevalences of TM (isolated and concurrent) and TP (isolated and concurrent) were 8.0% and 4.2%, respectively.

Conclusions: The prevalence values are within the range of values reported in other Nigerian studies but differ widely with values from other ethnic groups from other countries.

Key words: Ibo, Nigerian, prevalence, tori

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Introduction

Torus mandibularis (TM) and torus palatinus (TP) are painless benign bony outgrowths on the mandible and palate, respectively. TM is usually located at the lingual

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aspect of the mandible, above the mylohyoid line, while TP is located on the mid aspect of the hard palate. A number of studies have indicated a multifactorial etiology of tori in which genetics, the environment, diet, and parafunctional habits are important.[1,2] There is no consensus on the pathophysiology of the preponderant occurrence in either gender: Males[3] or females.[4,5]

The tori is of various sizes and shapes; they could be unilateral or bilateral, and single or multiple.[1,6] TM and TP may occur concurrently on the same subject. Although they are located in accessible intraoral sites, the majority of the subjects are oblivious of their presence.[7-9] Rarely, tori may become symptomatic and may present with traumatic ulcerations[9] or impaired speech and mastication. Pain, irregular ulcers, and osteonecrosis of tori have been reported in some patients treated with bisphosphonate medications (inhibitors of osteoclastic action), such as alendronate, for osteoporosis, metastatic bone diseases, and other bone conditions.[10,11]

Unlike TP, TM is not known to present before the first decade of life.[1,12,13] However, both may share similarities including the peak age of occurrence in the third decade.[1,12]

The prevalence values of tori in the literature are widely variable depending on the country, the race, the ethnic group, as well as the objectives, of the study. The overall prevalence of tori could range from 0.4%[14] to 28.12%.[13] Depending on the group studied, the prevalence of TP has been reported to be as high as 66.5%[14] while that of TM was reported as high as 42.6%.[15]

There are few studies on the prevalence of tori among black Africans, with only three done in Nigeria, in the South-West.[12,16,17] This is the first study of torus prevalence among an Ibo-speaking population in the South-East Nigeria.

Materials and Methods

The target population was people of Ibo ethnic group in Enugu, South-East Nigeria, with tori. The study population was all subjects with tori attending a dental clinic in Enugu over a 4-year period, from January 02, 2005 to December 31, 2009. The sample was from the consecutive attendee subjects at the clinic for dental check-up and treatment, of which 3000 met the inclusion criteria and were examined for TM and TP. Informed consent was sought and obtained from all the subjects attending the clinic for their participation in the study.

All subjects of Ibo ethnic group, of all ages and both sexes were included. Subjects with a previous or present history of oral tumors and oral surgical treatment for intra-oral swellings were excluded. Also excluded were subjects with any degree of trismus or mandibular or maxillofacial fracture or bone injuries. Subjects of other ethnic groups were excluded as well as subjects not resident in Enugu.

The examination was done while subjects were seated on a dental chair in a dental clinical setting under aseptic conditions. Each subject was examined with sterilized dental examination instruments that included a dental tray containing a pair of disposable examination gloves and a dental mirror. For each subject examined, clinically visible and digitally palpable intraoral palatal and/or mandibular tori where present, were recorded only once for the purposes of this study. The age, sex, ethnic group, type of tori based on location, and symptomatic awareness of tori presence were documented.

Statistical analysis

The data were analyzed with Statistical Package for Social Sciences (SPSS) version 17 Chicago: SPSS Inc. Prevalence and frequency of values were obtained. The test of significance was set at $P < 0.05$.

Results

Of the 3000 subjects examined for tori, 292 (9.7%) subjects had tori on the palate, mandible, or concurrently. Males constituted 12% of subjects with tori and 88% for females, giving a male: female ratio of 1:7.3. Table 1 shows the peak detection period was in the fifth decade of life. The minimum age at detection was 14 years, while the maximum age was 86 years. The age range in males with tori was 14–79 years, while in females it was 16–86 years. In subjects with tori, the mean age was 39.72 ± 13.4 years while the mode was 40 years. The Chi-square test showed no statistically significant difference between gender and type of tori in this study ($P = 0.34$). Similarly, there was no

Figure 1: A male subject with bilateral mandibular tori (torus mandibularis)

statistically significant difference between the age groups and type of tori with $P = 0.38$. There were six groups based on the age range: 10–19 years, 20–29 years, 30–39 years, 40–49 years, 50–59 years, 60 years, and above. There were two groups based on sex: Male and female. There were also three groups based on tori location: TM, TP, and Concurrent (TM and TP). TM and TP occurred concurrently in both the minimum age of occurrence of a 14-year-old male and the maximum age of occurrence of an 86-year-old female. Figure 1 shows bilateral mandibular tori in a male subject. Isolated TM occurred in 56.8% of the 292 subjects, Isolated TP in 17.5% and concurrent TM and TP in 25.7%. Table 2 shows a total of 367 tori (isolated on the mandible or palate and concurrent in both) distributed among 292 subjects: 241 (65.7%) in the mandible and 126 (34.3%) in the palate.

Of the 292 subjects with tori, only 3 (1%) had symptomatic awareness of tori presence. These subjects presented with anxiety related symptoms and complained primarily of the presence of intraoral bony outgrowths. Table 3 shows the prevalence of tori was 9.7% (292 of 3000). The prevalence of TM was 8.0% (241 of 3000) while the prevalence of TP was 4.2% (126 of 3000).

Table 1: Frequency of tori occurrence by age group

Age groups (years)	Number of subjects (%)
10-19	5 (1.7)
20-29	76 (26.0)
30-39	48 (16.4)
40-49	95 (32.5)
50-59	40 (13.7)
≥60	28 (9.6)
Total	292 (100)

TM=Torus mandibularis; TP=Torus palatinus

Table 2: Distribution of 367 tori in 292 subjects by location and sex

Type/location	Number in males (%)	Number in females (%)	Total tori (%)
Isolated TM	16 (9.6)	150 (90.4)	166 (100.0)
Concurrent TM	11 (14.7)	64 (85.3)	75 (100.0)
Isolated TP	8 (15.7)	43 (84.3)	51 (100.0)
Concurrent TP	11 (14.7)	64 (85.3)	75 (100.0)
Total	46 (12.5)	321 (87.5)	367 (100)

TM=Torus mandibularis; TP=Torus palatinus

Table 3: Prevalence of tori by location

Location (mandible or palate or both)	*n*	Prevalence (%)
Number of subjects with TM: (166 with isolated TM +75 with concurrent TM)	241	8.0 (241 of 3000)
Number of subjects with TP: (51 with isolated TP +75 with concurrent TP)	126	4.2 (126 of 3000)
Total	292	9.7 (292 of 3000)

TM=Torus mandibularis; TP=Torus palatinus

Discussion

The tori prevalence of 9.7% obtained among the Ibos in Enugu is within the range of values of 3.7–13.6%, reported by other Nigerian studies.[12,16,17] This value, however, contrasts with values from other national and ethnic studies[7] which reported widely varying ranges of tori prevalence as high as 28.12%.[13] Regarding the types of tori based on location, the values of 8.0% for TM and 4.2% for TP obtained among Ibos in Enugu, are also within the ranges of values by other Nigerian studies of 1.8–8.8% for TM and of 2.5–7.2% for TP.[12,16,17] The reported prevalence values of 42.6% for TM[15] and 66.5% for TP[14] are widely in contrast to the values obtained among the Ibos in Enugu and Nigeria. The multifactorial roles of genetics, diet, and environment[1,2] in the relative low prevalence values obtained with the Ibo population and other Nigerian studies could not be ascertained, being outside the scope of this study. However, the Ibos are black Africans with a diet that is presently a mixture of Western and local food based on wheat, cassava, yam, rice, beef, fish, fruits, legumes, and vegetables among others. Often the staple food based on cassava is swallowed with minimal mastication of accompanying vegetables and meat or fish.

The preponderance of females with tori, is consistent with results of all other Nigerian studies,[12,16,17] and this may not only be attributed to higher female dental awareness and clinic attendance. The consideration of genetic factors, dietary, and parafunctional habits in the etiology are documented findings.[1,2] Other national studies, however, reported varying gender preponderances of tori in either males[3] or females.[4,5] The factors that would determine preponderance in either gender are presently not clear, and outside of the generally reported etiological factors.[1,2] Among the Ibos in Enugu, all types of tori distribution occurred predominantly in females. Some other studies, however, reported TP to be more frequent in females,[4,5] and TM to be significantly commoner in males,[1,3,6] therefore, underlying the need for further research on the role of gender in etiology of specific types of tori. Among the Ibos of Enugu, the support for the predominance of TM in subjects of African descent[6,12,16,17] is further reflected where TM constitutes 65.7% of all tori seen.

The knowledge that most subjects are oblivious of tori presence[1,7-9] except when symptomatic,[10,11,15] corroborates our finding of only approximately 1% being symptomatically aware of the presence of TM or TP. The lack of awareness of tori presence, we propose, may be attributed to inadequate dental health education and dental visits, as well as slow and asymptomatic tori growth. Our subjects conscious of their tori, exhibited anxiety-related symptoms, which constituted the reason for treatment. Other rare reasons for tori treatment would include prosthetic indications,

the source of autogenous cortical bone for grafts, speech disturbance, traumatic ulcer, or obstructive sleep apnea.[15,18] Surgical treatment by excisional biopsy, bone shavings, or investigative incisional biopsy usually showed normal compact bone with marrow spaces.[18]

Conclusion

The painless benign bony outgrowths on the lingual aspect of the mandible and the middle of the hard palate of Ibos in the South-East Nigeria are consistent with mandibular and palatal tori respectively, reported in other studies. The prevalence is within the range of values reported in other Nigerian studies but lower than values of other population studies reported in the Asian and European literature.

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Conflicts of interest
There are no conflicts of interest.

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