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Torus Palatinus and Torus Mandibularis in a Nigerian Population

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ABSTRACT
Objective: The objectives of this study was to determine the prevalence, size, clinical characteristics, and location of torus palatinus (TP) and torus mandibularis (TM) in relation to age, sex and social stratification in a Nigerian population.
Methods: One thousand three hundred and ninety two subjects were examined for the presence of both tori at the Out patient clinic of the Department of Oral Medicine and Pathology, School of Dentistry University College Hospital Ibadan, Nigeria.
Results: Out of the 1,392 subjects examined, 52 (3.7%) had either Torus Palatinus (TP), Torus Mandibularis (TM) or both. The prevalence of TP and TM in the subjects were 1.8% and 2.5%, respectively. TP was significantly more common in females than in males (1.2% versus 0.6%). TP were frequently found in medium and small sizes and majority were solitary type. The prevalence of TM was higher in females than in males (1.9% versus 0.6%). TM occurred most commonly in small size, bilateral multiple forms, and was often located at the canine to premolar area. Females have both tori occurring concurrently more than male (Ratio 2 to 1). Most subjects with tori fall into class II social stratification, 51.9% compare with 21.1% and 23.0% as seen in Classes I and III respectively, 4.0% of subjects were unclassified.
Conclusions: The prevalence of both tori in this Nigerian population was comparable to the Black Americans and other African populations.

Key words: Torus mandibularis; torus palatinus; prevalence; social stratification

INTRODUCTION

Buccal exostoses are benign, broad-based surface masses of the outer or facial aspect of the upper jaw (maxilla) or, less commonly, the lower jaw[1]. Torus palatinus is a sessile nodule of bone that occurs along the midline of the hard palate[2]. Torus mandibularis is a bony protuberance located on the lingual aspect of mandible, commonly at the canine and premolar areas[3]. They begin to develop in early adulthood and may very slowly enlarge over years. They are painless and self-limiting, but occasionally may become several centimeters across and then contribute to periodontal disease of adjacent teeth by

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forcing food during chewing toward the teeth instead of away from them. If large, tori may also be a problem in the construction and wearing of dentures[4].

The prevalence of tori varies widely in different populations, ranging from 0.4% to 66.5% for torus palatinus[3,5,6,7,8,9,10,11] and 0.5% to 63.4% for torus Mandibularis[3,6,8,9,11,12,13]. Differences in the prevalence of tori between genders have also been reported[8,9,10,11,13,14]. Racial differences appear significant, with high prevalence in America, Asia and Europe[3,5,6,9,10,11,12,14].

The suggested aetiologic factors are masticatory hyperfunction[8,9,11], genetic factors[11], environmental factors[8,14] and continuos growth[15]. Recently, the etiology of tori has been postulated to be an interplay of multifactorial genetic and environmental factors[4,7,8].

The aim of the present study is to determine the prevalence, size, clinical characteristics and location of torus palatinus and torus mandibularis in relation to age, sex and social stratification in a Nigerian population.

MATERIAL AND METHOD

One thousand three hundred and ninety two patients who presented at out patient clinic of the department of Oral Medicine and Pathology, School of Dentistry UCH Ibadan between March and August 2004 were examined for the presence of tori.

Questionnaire was administered to elicit information on patient biodata and level of education.

The presence or absence of tori was assessed by clinical inspection and palpation performed by one examiner (JOA). The size of tori was measured at the highest elevation using divider and ruler. Each tori was measured twice and average taken. The average size of tori was graded as follows: 1-2cm (small), 2-3cm (medium) and >3cm (large). The clinical characteristic was classified as solitary or multiple. Subjects were classified into four social classes according to Famuyiwa and Olorunsogo's[16] Classification modified by Arowojolu[17].

The social class stratification is as follows:

I Executive managers, Company Directors, Professionals(Doctors, Lawyers, Engineers), University Professors, Traditional Chiefs.

II Civil servants, nurses, professional teacher, secretaries, Clergymen, Businessman and pensioners.

III (Semi-Skilled)-Tailors, Bricklayers, Carpenters, Typists, Sewing Mistresses, Clerk, House wife.

IV (Unskilled)- Messengers, Roadside traders, Cleaners, Night-guards, Farmers.

The SPSS (version 11.0) was used for the analyses. The Chi-square test was used to test for group difference. Significance level was set at $p<0.05$.

Result

The age of the patient with tori ranged from 17 to 71 years with a mean age of (36.2 ±13.2) years while the median was 32.5 years. Majority (84.5%) of the subjects were in the age group 20-49 years. The age of male subjects ranged from 17 to 49 years (mean 33.7± 9.9) while those of the female subjects ranged from 22 to 71 years (mean 37.2± 14.2). The prevalence of tori in each age group range from 0.6 as seen in age

group 10-19 years to 5.5 as seen in age group 40-49 years. The overall prevalence was 3.7 (Table 1).

Table 1: Prevalence of tori according to age

Age group in years	Total M+F	M+F with tori	Prevalence %
10-19	181	1	0.6
20-29	466	22	4.7
30-39	237	12	5.1
40-49	182	10	5.5
50-59	142	2	1.4
60-69	98	3	3.1
70-79	86	2	2.3
Total	**1392**	**52**	**3.7**

Out of the 1,392 subjects examined, 52 (3.7%) had either Torus Palatinus (TP) or Torus Mandibularis (TM) or both. These were made up of 14 (2.3%) of 603 males and 38 (4.8%) out of 789 females giving a male to female ratio of 1:2 (Table 2).

Table 2: Age and sex distribution of subjects

Age group in years	Male	Male + tori	%	Fe-ma-le	Fem-ale + tori	%
10-19	91	1	1.09	90	0	0.0
20-29	196	5	2.55	270	17	6.3
30-39	99	4	4.04	138	8	5.8
40-49	72	4	5.55	110	6	5.5
50-59	60	0	0.00	82	2	2.4
60-69	48	0	0.00	50	3	6.0
70-79 above	37	0	0.00	49	2	4.1
Total	**603**	**14**	**2.32**	**789**	**38**	**4.8**

Torus Palatinus (Location, Clinical Characteristics and Size.)

Out of 1,392 subjects, 26 (1.8%) had TP and were made up of 9(0.6%) males and 17 (1.2%) Females. The male to female ratio was (1:2). Out of the 21 cases of the solitary type, 12 were females and 9 subjects were male. While 5 cases were multiple and they were all females. 12 subjects (2 male, 10 female) have medium sized (2-3cm) TP while 8 subjects (4 male, 4 female) had small size and 6 subjects (2 male, 4 female) large size. (Table 3 and 4).

Torus Mandibularis (Location, Clinical Characteristics and Size).

Out of 1,392 subjects, 35 (2.5%) had TM and were made up of 8(0.6%) males and 27(1.9%) females. The male to female ratio was (3:8). Three cases were of the solitary type and all the 3 cases were male while 32 cases were of the multiple type, out of which 27 subjects were females and 5 subjects were males. 17 subjects (7 male, 10 female) have small size TM while 10 (2 male, 8 female) and 8 subjects (3 male,5 female)have medium and large size TM respectively (Table 3 and 4) .

Table 3: Distribution of tori according to location and clinical characteristic

Location	Sizes (cm)	Male	Female	No	Total
Mandible	1-2 2-3 >3	7 2 3	10 8 5	17 10 8	35
Maxilla	1-2 2-3 >3	4 2 2	4 10 4	8 12 6	26

Table 4: Distribution of tori according to sizes

Location	Clinical Characteristics	No	Total
Mandible	Single	3	
	Multiple	32	35
Maxilla	Single	21	
	Multiple	5	26

Concurrence

Nine (17.3%) subjects had both types of Tori occurring concurrently. They were made up of 3 males and 6 females.

Tori and Social Stratification

Eleven subjects fall into class I Social Stratification (one male, 10 female). In class II social stratification there were 27 subjects, 9 of which were males and 18 subjects were females. Class III social stratification was made up of 12 subjects, 2 males and 10 females. Two subjects didn't give there social status hence are grouped as unclassified these 2 subjects were males (Table 5).

Table 5: Prevalence of Tori according to social stratification

	M	F	Total
Class I	1	10	11
Class II	9	18	27
Class III	2	10	12
Unclassified	2	0	2

DISCUSSION

Oral tori have been defined as slow growing, osseous outgrowths at the midline of the hard palate and at the lingual surfaces of the mandible[1,2]. In the mandible the tori can be bilateral or unilateral, usually in the premolar regions but infrequently also at the genial tubercles[18]. The torus is considered a developmental anomaly and has been termed an exostosis, a benign hyperplastic overgrowth of the bony surface to differentiate it from a true neoplasm[18]. It presents either as a smooth bulging of the bone surface continuous with the adjacent area or as discrete, multilocular spherical projections with a broad base that forms a nodular cluster[1,18].

Tori have been consistently shown to be more frequently seen in the mongoloids than in the Caucasians[19,20]. Costich[21] speculated that tori maybe less common in blacks than in whites. Our findings confirm this view as a low prevalence rate of 3.74% was obtained in this study. A lower rate of 1.8% and 2.5% were calculated for torus palatinus and torus mandibularis respectively. Previous reports in mongoloid and Caucasian races showed higher rates[8,20,21]. Haugen[8] found a rate of 9.2% TP and 7.2% TM in a Norwegian population. Yaacob et al[20] found a high rate of 24.4% of TP in Malaysian but low prevalence of TM 2.2%.

The prevalence of TP and TM in this study corresponds with previous results in other African populations[19]. Our results agree with most previous studies in showing that TP is more common in females,[8,9,13,22] but contrast with findings that TM is more common in males[8,9,11,13,14]. Our study shows that females were 2.0 times as likely to have TP as males and 3.2 times as likely to

have TM as males. Haugen[8] stated that there was no obvious explanation for the gender differences but suggested genetics as a responsible factor.

A significant finding of this study was that torus mandibularis (2.5%) was more frequently seen in this population than torus palatinus (1.8%). It is of importance to note that 91.4% of torus mandibularis is of multiple type while 80.8% of torus palatinus is of single type. Kolas et al[23] had earlier reported that mandibular tori were found more frequently in American and African Negroes than palatal torus. Dosumu et al[19] and Bruce et al[18] also found higher incidence of torus mandibularis in Nigerian and Ghanaian populations. This is in agreement with our finding since most studies on other races [7,8,14,20,23,24,25] reported a higher prevalence of torus palatinus than torus mandibularis. The higher prevalence of the later may be peculiar to black race.

Other investigators reported a peak of occurrence of tori in the third decade of life[23,26]. Our observations showed a peak of occurrence of both tori in the fifth decade.

In the present study, the prevalence of tori tends to increase with age up to peak age group 40-49years. However, a trend for decreasing the occurrence of both tori was noted from the 50-59 year age group to the older age group this is in accordance with finding by previous authors[18,19,24]. This variation in prevalence, therefore, should be influenced by functional factors. The regression of TP was probably observed after the extraction of teeth. Eggen &Natvig [14] reported the similar result in Norwegians and surmised that decreased prevalence of TM among persons over 50 years of age was related to the decrease in number of remaining teeth. Sonnier et al[13] stated that the prevalence of TM was directly related to the presence of teeth. Wandee et al[24] stated that functional influences may contribute to the clinical expression of TP and TM. Eggen & Natvig [14] have also correlated the high prevalence of TM with increased masticatory stress.

Small tori were found more frequently than large tori, as in previous reports[7,8,11]. This finding contrasted with a study in Malaysia[20]. Interestingly, our study showed that females had higher occurrence of tori and tended to have more medium- and small- sized tori than males, which tends to have more small and large-size tori. We observed more bilateral TM than unilateral TM and symmetrical occurrence predominated [8,11,23]. In our study, TM was found to be in multiple nodules more than in single nodule which was in contrast with others that reported single tori as the most common type[8,11,23]. The high prevalence of both tori, as well as the differences in prevalence and size of tori with age and gender, support the hypothesis that torus should be considered a dynamic phenomenon, responding during life to environmental and functional factors, acting in a complicated interplay with the genetic factors[8].

More than half of the subjects with tori fall into class II social stratification (51.9%) while classes I and III form 21.2% and 23.1% respectively. The association between social class, educational status and tori is expressed by its high prevalence in social class II. The possible cause of this is not known but it may not be unconnected with type of diet taken by this class of subjects[24,27].

References

1. Stephen T.S.; Robert C.F.; Leslie F Principle and Practice of Oral Medicine; W.B.Saunders Company: Philadelphia, 1984; pp 476-477.
2. Carl O.B. Current Clinical Dental Terminology; The C.V. Mosby Company: Saint Louis, 1974; pp 411-412.
3. Wandee Apinhasmit; Aree Jainkittivong; Somporn Swasdison Torus Palatinus and Torus Mandibularis in a Thai Population. Science asia 2002; 28:105-111.
4. Seah, Y. H. Torus Palatinus and Torus Mandibularis: a Review of the Literature. Aust. Dent. J. 1995; 40:318-321.
5. Bernal, B. A.; Moreira, D. E.; Rodriguez, P., I [Prevalence of Torus Palatinus and Torus Mandibularis in the City of Havana]. Rev. Cubana Estomatol. 1983; 20: 126-131.
6. Chew, C. L.; Tan, P. H. Torus Palatinus. A Clinical Study. Aust. Dent. J. 1984; 29: 245-248.
7. Gorsky, M.; Raviv, M.; Kfir, E.; Moskona, D. Prevalence of Torus Palatinus in a Population of Young and Adult Israelis. Arch. Oral Biol. 1996; 41: 623-625.
8. Haugen, L. K. Palatine and Mandibular Tori. A Morphologic Study in the Current Norwegian Population. Acta Odontol. Scand. 1992; 50: 65-77.
9. Kerdpon, D.; Sirirungrojying, S. A Clinical Study of Oral Tori in Southern Thailand: Prevalence and the Relation to Parafunctional Activity. Eur. J. Oral Sci. 1999; 107: 9-13.
10. King, D. R.; Moore, G. E. An Analysis of Torus Palatinus in a Transatlantic Study. J. Oral Med. 1976; 31: 44-46.
11. Reichart, P. A.; Neuhaus, F.; Sookasem, M. Prevalence of Torus Palatinus and Torus Mandibularis in Germans and Thai. Community Dent. Oral Epidemiol. 1988; 16: 61-64.
12. Bernaba, J. M. Morphology and Incidence of Torus Palantinus and Mandibularis in Brazilian Indians. J. Dent. Res. 1977; 56: 499-501.
13. Sonnier, K. E.; Horning, G. M.; Cohen, M. E. Palatal Tubercles, Palatal Tori, and Mandibular Tori: Prevalence and Anatomical Features in a U.S. Population. J. Periodontol. 1999; 70: 329-336.
14. Eggen, S.; Natvig, B. Variation in Torus Mandibularis Prevalence in Norway. A Statistical Analysis Using Logistic Regression. Community Dent. Oral Epidemiol. 1991; 19: 32-35.
15. Topazian, D. S.; Mullen, F. R. Continued Growth of a Torus Palatinus. J. Oral Surg. 1977; 35: 845-846.
16. Famuyiwa OO; Olorunshola DA Some Family Factors in Sickle Cell Anaemia in Lagos, Nigeria. Nig. Med. practitioner 1998; 35: 70-73.
17. Arowojolu MO Effect of Social Class on The Prevalence and Severity of Periodontal Diseases. Nig. Med. practitioner 2001; 39: 26-28.
18. Bruce, I.; Ndanu, T. A.; Addo, M. E. Epidemiological Aspects of Oral Tori in a Ghanaian Community. Int. Dent. J. 2004; 54: 78-82.
19. Dosumu O.O.; Arotiba J.T.; Ogunyinka A.O. The Prevalence of Palatine and Mandibular Tori in a Nigerian Population. Odonto-Stomatologie Tropicale 1998; 6-8.
20. Yaacob, H.; Tirmzi, H.; Ismail, K. The Prevalence of Oral Tori in

Malaysians. J. Oral Med. 1983; 38: 40-42.
21. Costich E.R.Comment on Summer C.J. Prevalence of Tori. J. Oral Surg. 1968; 718-720.
22. King, D. R.; King, A. C. Incidence of Tori in Three Population Groups. J. Oral Med. 1981; 36: 21-23.
23. Kolas, S.; Halperin, V.; Jefferis, K.; Huddleston, S.; Robinson, H. B. The Occurrence of Torus Palatinus and Torus Mandibularis in 2,478 Dental Patients. Oral Surg. Oral Med. Oral Pathol. 1953; 6: 1134-1141.
24. Wandee A; Aree J; Somporn S Torus Palatinus and Torus Mandibularis in a Thai Population. Science Asia 2002; 28: 105-111.
25. Summers, C. J. Prevalence of Tori. J. Oral Surg. 1968; 26: 718-720.
26. Austin, J. E.; Radford, G. H.; Banks, S. O., Jr. Palatal and mandibular tori in the negro. N. Y. State Dent. J. 1965; 31:187-191.
27. Ossenburg N.S. Mandibular Torus. a Synthesis of New and Previously Reported Data and Discussion of Its Causes.; Ottawa, 1981; pp 1-52.