

Research

The Prevalence of Mandibular and Maxillary Bony Tori in Cameroon

Ashu Michael Agbor^{1*} and Christopher Ogunsalu²

¹School of Dentistry, Université des Montagnes, Bangangte-Cameroon

²International Postgraduate Medical College, Kingston -Jamaica

*Address for Correspondence: Ashu Michael Agbor, School of Dentistry, Université des Montagnes, Bangangte-Cameroon, E-mail: agborasm@gmail.com

Received: 26 March 2020; Accepted: 27 May 2020; Published: 28 May 2020

Citation of this article : Agbor, AM., Ogunsalu, C. (2020) The Prevalence of Mandibular and Maxillary Bony Tori in Cameroon. Ann Dent Sci Oral Biol, 1(1): 01-08.

Copyright: © 2020 Ashu Michael Agbor, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Oral bony tori is an abnormal hyperplastic bony growth in the oral cavity that is of clinical importance today. This aim of the study was to determine the prevalence and clinical characteristics of bony tori amongst patients attending dental hospitals in Cameroon.

A cross sectional descriptive study was carried out on patients who presented at 2 outreach clinics of the Limbe Provincial Hospital and the Université des Montagnes Teaching hospital- Bangangte, West Region of Cameroon between August and December 2017.

A total of 1424 patients participated in the study; 580 males and 844 females. The mean age was 48.3 years \pm 11.7 s.d., while 31 patients presented with bony exostosis with a frequency of 2.1%. Three quarters 23 (74.2%) of the tori was found in males, 8 (25.8%) females. More than half of the patients 18 (58.1%) resided in Bangangté, 13 (41.9%) Limbe. The prevalence of mandibular tori was 1.38%, mandibular tori 0.54% and 0.2% palatal tori.

The prevalence of bony tori in female patients was 0.56% and male was 1.6%. More than a third 12 (38.7%) of the patients had tori of 1-2 cm size, 10 (32.3%) had tori of 3-4 cm size, 9 (29.0%) presented with tori of 2-3 cm size. Two thirds 20 (64.5%) presented with tori on the mandibule, 8 (25.8%) in the maxilla, 3 (9.7%) in the palate. More than three quarters 25 (80.7%) of the patients did not notice an anomaly in their mouth, 6 (19.3%) were worried about the anomaly.

Dental surgeons in Cameroon should take into cognisance this high prevalence of tori when planning their treatment and should advice patients that they are not noxious to their health but a good and reliable source of autologous bone for bone regeneration as it can be used as biomaterial in the form of autogenous bone graft periodontology and dental implantology.

Keywords: Prevalence, Bony tori, Autologous bone graft, Cameroon

Introduction

Oral tori, (meaning “to stand out” or “lump” in Latin) enlargements of the osseous tissue in different parts of the upper and lower maxillaries [1]. These traits are described with different names such as osteomas, exostoses, hyperostoses, hyperplastic bone, or *tori*. The term *torus* (*tori* in plural) is the most used in the current literature because it is not directly associated with etiology [2]. It is generally classified as a benign oral tumor.

Oral exostoses (torus palatinus, torus mandibularis and torus maxillaris) are not a disease or a sign of disease. These oral exostoses are usually composed of mature dense cancellous bone with a rim of cortical bone of variable thickness [3,4]. Occasional minimal osteoblastic activity or even hemopoietic marrow can be seen [3].

Torus palatinus is a sessile nodule of bone that occurs along the midline of the hard palate [5]. Torus mandibularis is a bony protuberance located on the lingual aspect of mandible, commonly at the canine and premolar areas [5,6].

They begin to develop in early adulthood and may slowly enlarge over years. They are painless and self-limiting but occasionally may become several centimetres big and then contribute to periodontal disease of adjacent teeth obstructing oral function. If large, tori may also be a problem in the construction and wearing of dentures [7].

The prevalence of tori varies widely in different populations ranging from 0.4% to 66.5% for torus palatines [5,7-13] and 0.5% to 63.4% for torus Mandibularis [7,11-13]. Differences in the prevalence of tori between genders have also been reported [5,7-12]. The torus mandibularis is also quite common, is more prevalent in males and occurs bilaterally in 80% of cases. Racial differences appear significant with high prevalence in America, Asia and Europe [7-13].

There is a great deal of literature regarding the tori of the mouth and ear. However, there is controversy regarding the etiology and prevalence of each [5]. The suggested etiologic factors are masticatory hyperfunction [5,11-14], genetic [15], environmental factors [5,11,16] and continuous growth [17]. Recently, the etiology of tori has been postulated to be an interplay of multifactorial genetic and environmental factors [10,11]. These oral tori are thought to be inherited in an autosomal dominant manner with a relatively high penetrance, However, environmental and

functional factors may account for a more complex etiology than simply genetics [5].

The frequency of oral tori seen in dental clinics but has not been reported in Cameroon. Therefore, the aim of the present study was to determine the prevalence and clinical characteristics of bony tori amongst patients attending dental hospital in Cameroon.

Methods

This is a cross sectional descriptive study carried out between August and December 2017 on patients units of 2 hospitals. That is the outreach clinics of the Limbe Provincial Hospital in the south West Region and Université des Montagnes- Bangangte West Region of Cameroon.

A data capture sheet was used in collecting sociodemographic data. The presence or absence of tori was assessed by inspection and palpation performed by one examiner (AMA).

After which an impression of the upper and lower arches were taken in alginate, a cast made immediately, the size of tori was measured at the highest elevation using a vernier caliper manually. All measurements were standardized to the nearest one decimal point in millimetres. Criteria used in the measurement were based upon the shape, prominence and the dimensions of the tori. Each tori was measured twice and the average taken. The average size of tori was graded as follows: 1-2cm (small), 2- 3cm (medium) and >3cm (large).

Dimensions of the tori

To assess the tori dimensions, the tori are first grouped separately for maxillary tori and mandibular tori [12,13].

For maxillary tori

Width and length of tori: Width of the tori is measured based on the greatest mesio-distal dimension obtained at the point of greatest convexity on the tori, measured in millimetres [12,13]. Length of the tori is expressed as percentage ratio form, which is the greatest antero-posterior length of the tori [12,13]. The height or vertical dimension of the tori is measured in millimeters from the roof of the palatal vault to the most inferior point of convexity on the tori. If the tori is lobulated, and multiple lobules of varying vertical heights are present, only the most inferior point of convexity on the most prominent lobule is measured [12,13].

For mandibular tori

In the case of Mandibular Tori, most commonly patients present

with bilateral mandibular tori, however in very rare cases in our sample, certain patients did present with unilateral tori as well. In whichever case presented, both right and left mandibular tori are assessed individually and the mean average of their dimensions are used as reference [12,13].

Various dimensions of tori

Width of the tori is measured based on the greatest mesio-distal dimension obtained at the point of greatest convexity on the tori, measured in millimetres [12,13]. The greatest antero-posterior length of the tori is measured in mm [12,13]. Height or vertical dimension of the tori is measured in millimeters from the floor of the mouth to the most superior point of convexity on the tori, using 2 periodontal probes, one placed vertically from floor of mouth against the tori and the other perpendicular to the first probe at the most superior point of convexity on the tori [12,13]. If the tori is lobulated, and multiple lobules of varying vertical heights are present, only the most superior point of convexity on the most prominent lobule is measured. After individual measurements are made from each left and right tori, their mean average values are obtained by addition of both values of a category, and divided by two [12,13]

Subjects were classified into four social classes according to Famuyiwa, et al. [14].

The social class stratification is as follows:

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

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

Class III: (Semi-Skilled) - Tailors, Bricklayers, Carpenters, Typists, Sewing Mistresses, Clerk, Housewife.

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

Data was collected in a data captured sheet and Epi info (version 7) was used for data analyses. The Chi-square test was used to test for group difference. Significance level was set at $p < 0.05$.

Informed consent was taken from the patients and also from the hospital authorities.

Results

A total of 1424 patients made up of 580 males and 844 females were recruited in the study. The mean age was 48.3 years ± 11.7

s.d. Three quarters of the tori 23 (74.2%) was found in males, 8 (25.8%) females. More than half of the patients 18 (58.1%) resided in Bangangté (Nde), 13 (41.9%) Limbe. The prevalence of tori was 2.1%. The highest prevalence was found in the 60-69 age groups and the lowest in the 20-29 age groups (1.7%) (Table 1). Of all the patients who presented with bony tori, almost half 13(48.39%) of them belonged to class III groups; a third 10 (32.26%) to class IV, 2 (6.45%) to class I and (12.9%) class II (Table 2).

The prevalence of mandibular tori was 1.38%, mandibular tori 0.54% and 0.2% palatal tori.

The prevalence of bony tori in female patients was 0.56% and male was 1.6% (Table 3).

More than half 16 (51.61%) of the patients had bilateral torus mandibularis, 5 (16.13%) torus maxillaries, 4 (12.9%) torus mandibularis on the left side only, 3 (9.68%) torus maxillaris bilaterally, 3 (9.68%) torus palatinus (Table 4).

Table 1: Prevalence of bony Tori.

Age group	Frequency (Tori)	Prevalence (%)
10-19	0	0
20-29	4	1.6%
30-39	4	2.1%
40-49	7	2.8%
50-59	10	1.8%
60-69	6	4.9%
Total	31	2.2%

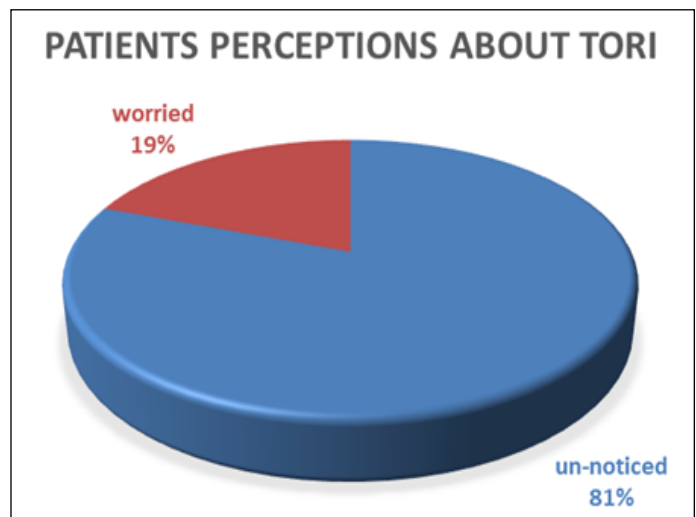


Figure 1: Patients perception about Tori.

More than a third 12 (38.7%) of the patients had tori of 1-2 cm size, one third 10 (32.3%) had tori of 3-4 cm size, less than a third 9 (29.0%) presented with tori of 2-3 cm size (Table 5).

More than three quarters 25 (80.7%) of the patients did not notice an anomaly in their mouth, 6 (19.3%) were worried about the anomaly (Figure 1).

More than three quarters 25 (80.65%) of the patients did not notice any growth in their mouth, a quarter 6 (19.35%) of the patients noticed a growth and were worried.

There was no statistical significant relationship between the perception and gender; $P=0.33$ (Table 6).

Two thirds 20 (64.5%) presented with tori on the mandible, 8 (25.8%) in the maxilla, 3 (9.7%) in the palate (Table 7).

Discussion

The frequency of bony tori is relatively low in Cameroon and their sizes are relatively larger. Oral tori are bony growth present in the oral cavity and are not considered as pathological lesions. Smaller tori do not cause any problems, but larger sized tori can result in significant problems. Though these bony exostoses are symptomless, they were usually surgically removed for esthetic or pre-prosthetic reasons [6]. Today with the reduction of the use of removable prosthetics, surgery on these bony protuberances have reduced significantly and serve as a harvest site of extra bony tissue that can be used for autogenous bone graft for gingival and dental implant surgeries.

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 [11]. 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 [15].

In the mandible the tori can be bilateral or unilateral, usually in the premolar regions but infrequently also at the genial tubercles [15]. In the current study, the prevalence and morphology of bony tori were analysed.

Prevalence

Tori are rarely seen in children and early adolescents. In the current study no patient below the age 19 was identified with a bony tori. This is consistent with a study carried out in Jamaica by Ogunsalu [16] who stated that Tori was seen on individuals above 14 years old. Other investigators reported a peak of

occurrence of tori in the third decade of life [17,18]. In the current study, the prevalence of tori was 2.1%. Tori was predominant in the 60-69 age groups and the lowest in the 20-29 age groups (1.7%). A similar study done in Nigeria by Agbanje, et al. [6] showed a peak of occurrence of both tori in the fifth decade [6]. They also observed that the prevalence of tori tends to increase with age up to peak age group 40-49 years. 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 [19,20]. This variation in prevalence, therefore, should be influenced by functional factors. The regression of TP was probably observed after the extraction of teeth [6]. Eggen and Natvig [21] 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. [17] stated that the prevalence of TM was directly related to the presence of teeth [17]. Wandee, et al. [22] stated that functional influences may contribute to the clinical expression of TP and TM. Eggen and Natvig [21] 14 have also correlated the high prevalence of TM with increased masticatory stress.

Previous studies have shown that Tori are more frequent in mongoloids than in the Caucasians [23-25]. Costich [21] speculated that tori may be less common in African Americans than in whites. This contradicts our study where the prevalence of tori was very low though similar to that of the Nigerian population. This is because the population in Cameroon and Nigeria share the same socioeconomic and cultural background This is the reason why even in the patients in Nigeria also share the same prevalence as that of Cameroon [6]. The reason for these similarities can be because Cameroon and Nigeria share the same ancestral origin, sociocultural and demographic profiles. Black populations in South Africa have also been shown to have a low prevalence of mandibular tori [22]. The prevalence of tori palatinus and tori mandibularis in this study corresponds with previous results in other African populations [22].

Our results disagree with most previous studies in showing that TP is more common in females [11,12,21] but confirm with findings that TM is more common in males [11,12,21]. Sexual discrepancies in the presentation of bony tori have been attributed to genetic constitutions [11].

Table 2: Distribution of Tori according to socio-economic groups.

SOCIAL CLASS	Frequency	Percent
Class 1. Executive managers, Company Directors, Professionals(Doctors, Lawyers, Engineers), UniversityProfes- sors, Traditional Chiefs	2	6.45%
Class 2. Civil servants, nurses, professional teacher, secretaries, Clergymen, Businessman and pensioners.	4	12.90%
Class 3. (Semi-Skilled)- Tailors, Bricklayers, Carpenters, Typists, Sewing Mistresses, Clerk, Housewife.	13	48.39%
Class 4. (Unskilled)- Messengers, Roadside traders, Cleaners, Night-guards, Farmers.	10	32.26%

Table 3: Distribution of Tori according to gender.

Sex/Site	Mandible N (%)	Maxilla N (%)	Palatal N (%)	Total N (%)
F	6 (0.4%)	2 (0.14%)	0	8 (0.56%)
M	14 (0.98%)	6 (0.4%)	3 (0.2%)	23 (1.6%)
TOTAL	20 (1.38%)	8 (0.54%)	3 (0.2%)	31 (2.2 %)

Table 4: Distribution of Tori according to location in the oral cavity.

Presentation of exostosis	Frequency	Percent
bilateral mandibulaires tori	16	51.61%
tori maxillaris (left)	5	16.13%
tori mandibularis (left)	4	12.90%
bilateral tori maxillaris	3	9.68%
tori palatinus	3	9.68%
Total	31	100.00%

Table 5: Size of tori.

Dimension	Frequency	Percentage
1-2cm	12	38.71%
3-4cm	10	32.26%
2-3cm	9	29.03%
Total	31	100.00%

Table 6: Perception of bony tori according to gender.

Perception	Un-noticed N (%)	Worried N (%)	Total N (%)
Female	6 (24.00%)	2 (33.33%)	8 (25.80%)
Male	19 (76.00%)	4 (66.67%)	23 (74.19%)
TOTAL	25 (80.65%)	6 (19.35%)	31 (100.00%)

Table 7: Site of Tori.

Site	Frequency (N)	Percent (%)	Prevalence (%)
Mandibular	20	64.52%	1.4
maxillary	8	25.81%	0.6
Palatal	3	9.68%	0.2
Total	31	100.00%	2.2

Another finding of the current study was that torus mandibularis (1.4%) was more frequently seen in this population than torus maxillaris (0.6%) and palatinus (0.2%). Kolas, et al. [18] had observed that mandibular tori were found more frequently in American and African Negroes than palatal torus. Dosumu et al. [23] also found higher incidence of torus mandibularis in Nigerian and Ghanaian populations [26]. This confirms that torus mandibularis is common in black African population. Torus maxillaris and palatinus has been reported to be more common in other races [10,11,13,14].

Location

Torus mandibularis: In the current study, torus mandibularis was twice present in males than females. Most of them were located at the anterior half of the mandibular arch. This was also reported by Mermoud and Hoarau [27] who described torus mandibularis is a nontender, bony outgrowth located on the lingual side of the mandible, in the canine or premolar region, above the attachment of the mylohyoid muscle. In most cases, bilateral tori are present [27] (Figure 2). Torus mandibularis is usually asymptomatic and discovered incidentally. The prevalence varies substantially between ethnic groups, with lower prevalence in whites (about 8%) and blacks (about 16%) and higher prevalence in Asian and Inuit populations [27].

Torus mandibularis is thought to be caused mainly by environmental factors, such as bruxism, vitamin deficiencies and calcium-rich supplements, although genetic background also plays a key role [27]. Clinical diagnosis is usually straightforward, and investigations are generally not required [27]. However, peripheral ossifying fibroma, osteoma, osteochondroma, osteoid osteoma, osteoblastoma and osteosarcoma should also be considered in the differential diagnosis of a unilateral, growing lesion. In particular, the presence of pain or paresthesia should prompt further investigation [27] (Figure 3).

In the current study, the majority of tori maxillaries were unilateral and was mostly found in the males than females. It has been reported that mandibular growth rate can be twice at the age period 14 to 16 years as for age period 16 to 20 years especially in females during late adolescence. The growth of torus mandibularis is very slow, associated with the growth of the mandible or maxilla and may stop spontaneously though this may be subjected to genetic and environmental factors. Surgical resection is seldom



Figure 2: Bilateral torus mandibularis.



Figure 3: Unilateral Torus palatinus.

necessary, but is indicated when ulceration, articulation disorder or problems inserting dentures are present [27].

Form and sizes

In the current study, there is a high incidence of bony tori in males than females with higher incidences of different types of bony exostosis in all sites located in males. 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 [11].

The current study, almost half 13 (48.39%) of the patients were patients who belonged to class 3 social stratification group, this is contrary to another study in Nigeria where more than half of the subjects with tori fall into class II social stratification (51.9%) [6]. Agbaje, et al. [6] were able to establish the association between social class, educational status with a particular socio-economic group. The possible cause of this is not known but it may not be unconnected with type of diet taken by this class of subjects [27,28].

Clinical applications

The torus is mainly removed due to prosthodontic reasons to suit a dental prosthesis or a dental prosthesis can be modified so as not create hard and soft tissue trauma during insertion and use of prosthesis. The torus may also be used as biomaterial in the form of autogenous bone graft, not only in periodontology, but also in dental implantology.

Dental surgeons in Cameroon should take into cognisance this high prevalence of torus when planning their treatment and should advice patients that they are not noxious to their health.

Conclusions

The frequency of bony tori in Cameroon was 2.1%, affecting more males than females and was more in the class III (low) social group.

The prevalence of mandibular tori was 1.38%, mandibular tori 0.54% and 0.2% palatal tori. Torus mandibularis most frequent, especially the bilateral torus mandibularis and was twice present in males than females. Most of them were located at the anterior half of the mandibular arch. Larger tori were more in males.

Conflict of Interests

The authors declare that there is no conflict of interests regarding

the publication of this paper.

Authors' Contributions

AMA was involved in the conception, design, acquisition of data, and interpretation of data and drafting the manuscript from the beginning to the end.

CO was involved in the conception, design and drafting the manuscript revising it critically for important intellectual content.

References

1. García-García, AS., Martínez-González, JM., Gómez-Font, R., Soto-Rivadeneira, A., Oviedo-Roldán, L. (2010) Current status of the torus palatinus and torus mandibularis. *Med Oral Patol Oral Cir Bucal*, 15(2): e353-60.
2. Galera, V., Moreno, JM., Gutiérrez, E. (2004) Oral tori in a sample of the Spanish university students: prevalence and morphology. *Antropologia Portuguesa*, 281-305
3. Loukas, M., Hulsberg, P., Tubbs, RS., Kapos, T., Wartmann, CT., Shaffer, K., et al. (2013) The tori of the mouth and ear: A review. *Clin Anat*, 26(8): 953-960.
4. Jainkittivong, A., Langlais, RP. (2000) Buccal and palatal exostoses: Prevalence and concurrence with tori. *Oral Surg Oral Path*, 90(1): 48-53.
5. Gnepp, DR. (2001) Diagnostic surgical pathology of the head and neck. Philadelphia: Saunders, 159-161.
6. Agbaje, JO., Arowojolu, MO., Kolude, B., Lawoyin, JO. (2005) Torus Palatinus and Torus Mandibularis in a Nigerian Population. *African Journal of oral Health*, 2(2): 30-36.
7. Seah, YH. (1995) Torus Palatinus and Torus Mandibularis: a Review of the Literature. *Aust Dent J*, 40(5): 318-321.
8. Bernal, BA., Moreira, DE., Rodrigue, PI. (1983) Prevalence of Torus Palatinus and Torus Mandibularis in the City of Havana. *Rev Cubana Estomatol*, 20(2): 126-131.
9. Chew, CL., Tan, PH. (1984) Torus Palatinus. A Clinical Study. *Aust Dent J*, 29(4): 245-248.
10. Gorsky, M., Raviv, M., Kfir, E., Moskona, D. (1996) Prevalence of Torus Palatinus in a Population of Young and Adult Israelis. *Arch Oral Biol*, 41(6): 623-625.
11. Haugen, LK. (1992) Palatine and Mandibular Tori. A Morphologic Study in the Current Norwegian Population. *Acta Odontol Scand*, 50(2): 65-77.

12. Austin, JE., Radford, GH., Banks, SO. (1965) Palatal and mandibular tori in the negro. *N Y State Dent J*, 31: 187-191.
13. Kalaighan, P., Mohan, JS., Jayakumar, A. (2018) Determination of Grading for Maxillary and Mandibular Tori- an in Vivo Study. *Biomed Pharmacol J*, 11(2).
14. Famuyiwa, OO., Olorunshola, DA., Derin, A. (1998) Some family factors in sickle cell anaemia in Lagos, Nigeria. *Nig Med Practitioner*, 35(5/6): 70-73.
15. Bruce, I., Ndanu, TA., Addo, ME. (2004) Epidemiological Aspects of Oral Tori in a Ghanaian Community. *Int Dent J*, 54(2): 78-82.
16. Ogunsalu, CO. (1994) Oral tori in Jamaicans of African origin: a clinical study. *West Indian Dental J*, 1(1): 5-7.
17. Sonnier, KE., Horning, GM., Cohen, ME. (1999) Palatal tubercles, palatal tori, and mandibular tori: prevalence and anatomical features in a U.S. Population. *J. Periodontol*, 70: 329-336.
18. Kolas, S., Halperin, V., Jefferis, K., Huddleston, S., Robinson, HB. (1953) The Occurrence of Torus Palatinus and Torus Mandibularis in 2,478 Dental Patients. *Oral Surg Oral Med Oral Pathol*, 6(9): 1134-1141.
19. Bernaba, JM. (1977) Morphology and Incidence of Torus Palatinus and Mandibularis in Brazilian Indians. *J Dent Res*, 56(5): 499-501.
20. Reichart, PA., Neuhaus, F., Sookasem, M. (1988) Prevalence of Torus Palatinus and Torus Mandibularis in Germans and Thai. *Community Dent Oral Epidemiol*, 16(1): 61-64.
21. Eggen, S., Natvig, B. (1991) Variation in torus mandibularis prevalence in Norway. A Statistical Analysis Using Logistic Regression. *Community Dent. Oral Epidemiol*, 19(1): 32-35.
22. Wandee, A., Aree, J., Somporn, S. (2002) Torus Palatinus and Torus Mandibularis in a Thai Population. *Science Asia*, 28: 105-111.
23. Dosumu, OO., Arotiba, JT, Ogunyinka, AO. (1998) The Prevalence of Palatine and Mandibular Tori in a Nigerian Population. *Odonto-Stomatologie Tropicale*, 6-8.
24. Yaacob, H., Tirmzi, H., Ismail, K. (1983) The Prevalence of Oral Tori in Malaysians. *J Oral Med*, 38(1): 40-42.
25. Ihunwo, AO., Phukubye, P. (2006) The frequency and anatomical features of torus mandibularis in a Black South African population. *Homo*, 57(4): 253-262.
26. Bruce, I., Ndanu, TA., Addo, ME. (2004) Epidemiological aspects of oral tori in a Ghanaian community. *Int Dent J*, 54(2): 78-82.
27. Mermoud, M., Hoarau, R. (2015) Mandibular tori. *CMAJ*, 187(11): 826.
28. Telang, LA., Telang, A., Nerali, J., Pradeep, P. (2019) Tori in a Malaysian population: Morphological and ethnic variations. *J Forensic Dent Sci*, 11(2): 107-112.