FREQUENCY OF ORAL TORI AMONG DENTAL PATIENTS ATTENDING THREE MILITARY HOSPITALS IN JORDAN

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ABSTRACT

Objective: The aim of this study was to assess the frequency of torus palatinus and torus mandibularis in patients attending three military hospitals in Jordan during a two years period (2000-2002).

Methods: During the study period, 1000 patients who attended prosthetic clinics at the three military hospitals (King Hussein Medical Center, Prince Hashem Ben Al-Hussein Hospital - Zarqa and Queen Alia Hospital- Amman) were examined clinically for the presence of oral tori (torus palatinus, torus mandibularis). The size, shape and location of the tori were recorded.

Results: Among the study group, 484 (48.4%) were males and 516 (51.6%) were females, their age ranged from 7-80 years. The frequency of torus palatinus was 31 (3.1%), torus mandibularis was 23 (2.3%) and both tori were only found in five (0.5%) subjects. The male : female ratio of torus palatinus and torus mandibularis were 1:2 and 1:09 respectively. The smooth type for both torus palatinus and torus mandibularis were found in 44 (81.5%) subjects. Regarding the size and location of oral tori, 23 (42.6%) were smaller than two cm and 35.2% were located in the molar area.

Conclusion: The data of this study revealed that the frequency of torus palatinus was greater in females than in males whereas the same frequency were found in females and males for torus mandibularis. Although a substantial number of investigations have been conducted in patients from various origins, global information about tori is incomplete.

Key words: Torus palatinus, Torus mandibularis, Frequency

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Introduction

Oral tori represent non-pathological localized bony protuberances that frequently develop in the human jawbones. The commonest sites are the middle of the palate and the lingual mandibular alveolus. The two most common types that occur in two specific intra-oral locations are termed torus palatinus (TP) and torus mandibularis (TM).[1]

TP is an osseous outgrowth that arises along the midline of the hard palate whereas TM is usually found on the lingual aspect of the mandible between the cuspids and the second premolars midway between the soft tissue floor of the mouth and the crest of the alveolar process. TM varies in size from that of a pea to that of a hazelnut. The cause of occurrence of tori is not fully known, although interplay of genetic and environmental factors may play a role in their development.[2-5]

The prevalence of tori has been studied in a number of populations (Table I). It was varied from 0.4-70%[6,7] for TP, and from 0.1 to 63%[8,9] for TM. Most investigators found the occurrence of TP to be more frequently in female than in male with a ratio-of 1.7:1,[8,10] while the occurrence of TM was found to be higher in males than in females.[6,10] TP and TM were found to be associated in a trait of combined torus formation in 0.3-8%[11] of cases.

Morphologically, tori can be smooth or lobular.[1] They are covered by an extremely thin layer of soft

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Table I. Prevalence of tori in some countries.

Country	TP	TM	Author(s)	Year
India	9.5%	1.4%	Shah *et al.*[13]	1992
Brazilian Indians	10%		Bernaba JM[9]	1977
Germany	13%	5.2%	Reichart *et al.*[11]	1988
Israel	21%	-	Gorsky *et al.*[14]	1995
Northern Thailand	23%	9.4%	Reichart *et al.*[11]	1988
Southern Thailand	61.7%	29.9%	Kerdpon & Siriungrojying [15]	1999
U.S.A.	69.7%	38.7%	Chohayeb & Volpe[6]	2001

tissue, and for that reason patients wearing dentures, may be irritated by every slight movement of a denture base. A satisfactory maxillary removable denture can be made over most palatine tori, however the indications for removal of tori include[12]:

1. An extremely large torus filling the vault of the palate and preventing the formation of an adequate base for a stable maxillary prosthesis.
2. A torus extending posteriorly beyond the vibrating line so that it would prevent the development of posterior palatal seal for the denture.
3. Tori with severe undercuts protruding like a mushroom upside-down. Food and debris are trapped in the undercuts, causing chronic inflammation, infections and bad oral odor
4. Torus creates a psychological problem for the patient.

Although a substantial number of investigations on the prevalence of tori in different ethnic groups have been conducted, it is the aim of this study to determine the occurrence of tori in relation to age, gender, size, shape and location of tori in three military hospitals in Jordan.

Methods

One thousand patients attending the prosthetic dental clinic in the main department and the out-door clinics at the King Hussein Medical Center and Prince Hashem Ben Al Hussein Hospital and Queen Alia Hospital were examined by one of the three authors. All the examiners are prosthodontists who are very familiar with the condition. Patients were examined between July 2000 and June 2002 over two year period. Of the examined group 484 (48.4%) were males and 516 (51.6%) were female, the age range was between 7-80 years (mean age 43.3 years). For each patient, the palatal aspect of the upper jaw and the lingual surface of the mandible were carefully dried and examined by clinical inspection and palpation. Only large, noteworthy nodular bony mass of more than 3mm was considered a torus, small thickening or elevation that could be detected by palpation rather than by vision was considered as normal anatomy. If a positive finding was recorded, the size of the torus was measured with a periodontal probe and categorized into three types; small (<2cm), medium (2-4cm) and large (>4cm). The location according to the neighboring teeth (premolar, molar or cuspid) and the shape whether smooth or nodular was also recorded.

Tabulated analysis using chi-square test for significant differences was used to find the relationship of age, gender, size, and location.

Results

TP was recorded in 31 (3.1%) of all individuals examined, of those 20 (64.5%) were females and 11 (35.5%) were males, therefore TP was significantly ($P<0.001$) more prevalent in women than in men. TM was found in 23 (2.3%) of all individuals, giving almost the same prevalence as TP although it was slightly higher in males (n=12, 52.2%) than in females (n=11, 47.8%). The combined occurrence of TP and TM was found in only five (0.5%) patients, four (80%) of them were females.

The frequency of tori studied in relation to age revealed that the majority of the tori (about 67%) were found in the age group above 30 years. The presence of tori in relation to age and sex are shown in Table II.

Regarding the size of the tori, small, medium and large tori were observed in 35.5%, 58.1% and 6.4% respectively for TP, while 52.2%, 39.1% and 8.3% respectively for TM. The shape of the tori revealed that the smooth type of the protuberance was noted in 23 (74.2%) and 21 (91.3%) cases for TP and TM respectively, while the lobulated type was found in eight (25.8%) and two (8.7%) cases for TP and TM respectively. The site of tori revealed that 10 (32.2%), 10 (32.2%) and 11 (35.6%) of the TP were located in the molar, premolar and combined molar-premolar areas respectively, whereas four (17.2%), 10 (43.7%) and nine (39.1%) of TM were located in the cuspid, premolar and in the combined molar-premolar area respectively. Table III shows the results of the tori in relation to size, location, and shape.

Discussion

Several studies have shown considerable differences in the frequency of tori. This can be attributed to many factors, such as the ill-defined criteria for their diagnosis or classification.[8] Another important factor is whether the investigations were conducted on human studies or autopsy material in live patients or on dried skulls, as variants obtained from dried skulls are higher than those obtained from living subjects.

Table II. Prevalence of tori in relation to age and gender.

Age groups (years)	Number of patients		Termed torus palatinus (TP)		Torus mandibularis (TM)		Combined	
	Male	Female	Male	Female	Male	Female	Male	Female
7-10	34	39	2	0	0	1	0	0
11-20	59	61	1	3	1	0	0	0
21-30	51	63	1	3	1	2	0	2
31-40	94	86	3	5	2	2	0	1
41-50	73	88	2	3	1	3	1	0
51-60	67	78	1	3	2	2	0	0
61-70	62	79	1	2	2	1	0	0
71-80	44	22	0	1	1	2	0	0
Total	484	516	11	20	10	13	1	4

Table III. Prevalence of tori in relation to size, location, and shape.

Age	Size						Location						Shape			
	Small		Medium		Large		Termed torus palatinus (TP)			Torus mandibularis (TM)			Smooth		Lobulated	
	TP	TM	TP	TM	TP	TM	Molar	Prem.	Combi.	Cuspid	Prem.	Comb.	TP	TM	TP	TM
7-10	1	1	1	0	0	0	1	0	1	0	1	0	2	0	0	1
11-20	2	0	2	1	0	0	1	2	1	0	0	1	2	1	2	0
21-30	1	1	2	2	1	0	1	1	2	0	1	2	2	1	2	1
31-40	3	2	5	2	0	0	3	4	1	1	2	1	6	4	2	0
41-50	2	3	3	2	0	0	2	1	2	1	2	1	4	4	1	0
51-60	1	2	2	1	1	1	1	2	1	1	1	2	3	4	1	0
61-70	1	1	2	1	0	1	1	0	2	0	2	1	3	3	0	0
71-80	0	2	1	0	0	0	0	0	1	1	1	1	1	3	0	0
Total	11	12	18	9	2	2	10	10	11	4	10	9	23	21	8	2

Although tori should be clinically simple to diagnose, in this study the subjects were examined by clinician experienced with the condition. TP were evident in 3.1% of the studied population, a slightly higher prevalence rate was found in other studies. It was observed in 9.5% in an Indiana population[13] and in 10% of Brazilian Indians.[9] A much higher prevalence rate was found in other studies (Grosky *et al.*[14] 21%, Reichart *et al.*[11] 23.1%). However a very high prevalence up to 70% in a study performed by Chohayeb and Volpe[6] was demonstrated in women of different ethnic groups (African Americans, Caucasians, Hispanics, Asians and Native Americans) residing in USA.

TM on the other hand was found in 2.3% of the current study population. A low prevalence rate of 1.4% was found in Indians[13], 8.5% was found in the USA.[7] Reichert *et al.*[11] found the prevalence of TM to be 5.2% in Germans and 8.6% in the Thai. A prevalence rate reaching 30% was found in Thailand.

In this study, the combined occurrence of both TP and TM in the same individual was 0.5%. Other studies found that a prevalence of 0.7%[11] in German population and 2.22% in subjects from Oslo, Norway.[8] Of the 1000 subjects in the current study, TP was significantly more ($P < 0.001$) prevalent in women than in men. Many other studies reported similar results.[11,13-15]

The frequency of TM in this study was found to be higher in males (52.1%) than in females (47.9%) with many other studies supporting this finding.[7,11,15] Another study however has shown an opposite relation.[5] The combined occurrence was also higher in females (80%) than in males (20%) and this is also in agreement with other studies.[2,8,15]

Although many investigations[2,4] showed that the prevalence of oral tori increase with age in this study 67% of oral tori were found in the age group of 7-30 years, this may be related to the higher number of subjects examined within this age group. TP was more prevalent in this study in the middle age group (52%), while it shows only minor or not significant differences in the other age groups (6-20%). This finding is supported by other studies[2,8,14] TM on the other hand was mainly evident in the middle age group (43.5%) and shows only minor differences among the different age group (4-22%).

When size, shape and location of tori were studied, TP of medium and large size accounted for about 59% of the cases, whereas TP smaller than 2cm were found in 41% of the cases. Other studies also give similar results.[13,14] It should be noted in this regard that since

tori are measured in cm. it would be rare to find larger ones in children. The smooth type of protuberance comprised 80% of the cases and this is in agreement with the finding of other investigations that report the lobular type is the least frequent. [9,14]

Site-specific rates for tori demonstrate that more than 50% of the TP were located in the molar area in cases in the second and third decades. The proportions in this area diminish with age. The combined molar-premolar area increases from 22% in the first decade up to 66% in middle and old ages. This agrees with other studies that show TP to grow with age from molar towards the premolar area. Eggen *et al.* reported[4] the continuous growth of tori in adult patients and this may support the hypothesis that tori larger than 2cm increases with age. TM was almost exclusively found in the combined cuspid and pre-molar area.

Conclusion

This investigation provides information about the frequency of oral tori in military hospitals in Jordan. Of the 1000 individuals examined, between the ages of 7-80 cases, TP was found in 3.1% and TM 2.3% cases, while the combined conditions were found in five (0.5%) cases. TP were more common in females than in males. More than 65% of the TP cases were found in the molar-combined area in the above fourth decade age group, same finding was found for TM in the premolar-combined region.

References

1. **Antoniades DM, Belazi M Papanayiotou P.** Concurrence of torus palatinus with palatal and buccal exostoses, case report and review of literature. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1998; 85: 552-557.
2. **Eggen S.** Torus Mandibularis: An estimation of the degree of genetic determination. *Acta Odontal Scand* 1989; 47: 409-415.
3. **Gorsky M, Bukai A, Shohat M.** Genetic influence on the prevalence of torus palatinus. *Am J Med Gent* 1998; 13: 138-40.
4. **Eggen S, Natvig B, Gasemyr J.** Variation in torus palatinus in Norway. *Scand J Dent Res* 1994; 102: 54-59.
5. **Clifford T, Lamey PJ, Fartash L.** Mandibular tori, migraine and temporomandibular disorders. *Br Dent J* 1996; 180:382-384.
6. **Chohayeb AA, Volpe AR.** Occurrence of torus palatines and mandibularis among women of different ethnic group. *Am J Dent* 2001; 14: 278-280.
7. **Bouquot JE, Gundlach KKH.** Oral exophytic lesions in 23,616 white Americans over 25 Years of age. *Oral Surg Oral Med Oral Pathol* 1986; 62: 284-291.
8. **Haugen LK.** Palatine and mandibular tori. A morphologic study in the current Norwegian population. *Acta. Odontol Scand* 1992; 50:65-77.
9. **Bernaba JM.** Morphology and incidence of torus palatinus and mandibularis in Brazilian Indians. *J Dent Res* 1977; 56: 499-501.
10. **Seah YH.** Torus Palatinus and torus mandibularis: A review of the Literatures. *Aust Dent J* 1995; 40: 318-321.
11. **Reichart PA, Nenhaus F, Sookasem M.** Prevalence of torus palatinus and torus mandibularis in Germans and Thais. *Community Dent Oral Epidemial* 1988; 16: 61-64.
12. **MacInnis EL, Hardie J, Baig M, Al-Sanea RA.** Gigontiform torus palatinus: Review of the literature and report of a case. *Int Dent J* 1998; 48: 40-43.
13. **Shah DS, Sanghavi SJ, Chawda JD, Shah RM.** Prevalence of torus palatinus and torus mandibularis in 1000 patient. *Indian J Dent Res* 1992; 3: 107-110.
14. **Gorsky M, Raviv M, Kfir E, Moskona D.** Prevalence of torus palatinus in a population of young and adult Israelis. *Archs Oral Biol* 1996; 41: 623-625.
15. **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.