Prevalence of torus palatinus and torus mandibularis in a sample of Baghdad population

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ABSTRACT
Background: Although some oral lesions, such as torus palatinus and torus mandibularis are normal variants, but require prompt diagnosis and sometimes treatment to reduce the potential for serious complications and enhance prosthodontic treatment. The purpose of this study is to inspect the prevalence of torus palatinus (TP) and torus mandibularis (TM), with their relations to TMJ dysfunction syndrome.

Material and method: The sample consisted of 932 persons, 301 males and 631 females were examined for the presence of TP and/or TM. Analysis was carried out according to age, gender, TMJ dysfunction and chronic diseases to the presence of TP and TM.

Results: indicated that 49 (5.3%) had TP; whereas 67 (7.2%) had TM. The male: female prevalence ratios of TP and TM were 1:3.42 and 1:1.81 respectively.

Conclusion: TP and TM were more frequent in females and there is significant relation between the TP and TM with presence of TMJ dysfunction syndrome (P<0.05) especially TM, the presence of TM might be useful to look for sign of dysfunction.

Key words: Torus palatinus (TP), torus mandibularis (TM).

INTRODUCTION
In general torus is a hyperplastic overgrowth of bone common to both maxilla and mandible. The torus palatinus is located at the junction of the palatine process of maxillary bones in the midline of the hard palate in about 20% of the population, while mandibular tori is on the lingual aspect of the mandible in the premolar region, the torus may be smooth and pedunculated and covered with mucosa that varies in quality and quantity, they are also vary in size. (1)

The torus has been mentioned in the literature for about 180 years. (2) In current thinking, the occurrence of tori is considered to be interplay of genetic and environmental factors; this theory proposes that the environmental factors responsible must first reach a threshold level before the genetic factors. (3)

Frohlich and Pedersen found that variation in the mandible were related to metric changes rather than to changes in the morphological configuration and changes in non-metric frequencies. (3)

Torus palatinus is covered by thin layer of mucous membrane that is easily traumatized by the denture base unless a relief is provided. The torus mandibularis is covered by an extremely thin layer of mucous membrane, it’s often needs to be removed surgically as it can be difficult to provide relief with in the denture for the torus without breaking the border seal. (4-6).

Brunsvoeld et al in 1995 (7) followed up the recurrence of mandibular tori after surgical removal, and they found that recurrence of mandibular tori may happen after removal.

The prevalence and features of palatal tubercles were observed in many studies, Sonnier found a higher prevalence among males and mandibular tori were observed in 27% of all skulls with higher prevalence also seen among males (8). Kerdpon found that 61.7% had TP whereas 29.9% had TM. The male/female prevalence ratios of TP and TM were 1:1.4 and 1:0.94 respectively. TP was thus, more equaling females. (9)

Cliffard et al found that mandibular tori were present significantly more commonly in both migraineurs and temporo-mandibular disorders (TMD) patients. (10) The results support an association with parafunction in the etiology of mandibular tori.

Eggen and Natvig revealed that the concurrence of TP and TM was statistically significant among women but not among men. They also revealed that TP seemed likely to arise from a multifactorial liability with part of the genetic factors residing on the chromosome. (11)

Shah et al found that the prevalence of torus palatinus and torus mandibularis was 9.5% and 1.4% respectively and the prevalence of torus palatinus was more common in age group of 11–
Haugen showed that the prevalence figures of torus palatinus predominance in female with a gender ratio of 5:3, whereas in torus mandibularis the males were in majority and the gender proportion was 4:3. In both genders prevalence of the two tori was highest in the 35–65 years age group. The objective of the present study was to:

1. Observe the prevalence of torus palatinus and torus mandibularis among Iraqi people and investigate their association with age and gender.

2. To investigate the relationship of oral tori and TMJ disorders (parafunctional activity).

MATERIALS AND METHODS
The sample consisted of 932 individuals, 301 males and 631 females aged 20 years and over in the area of Baghdad-Iraq. They were interviewed and examined and a short medical history was obtained including presence of any chronic diseases, medical complaints or drug intake. Record on chart as normal or indicate pertinent illness, some diseases affect the jaws more directly than others and may give rise to symptoms. Chronic diseases were divided according to the systems affected, cardiovascular system diseases like hypertension, endocrine system like diabetes, diseases of gastrointestinal tract, urinary tract, respiratory system, skeletal system like rheumatoid arthritis and central nervous system.

Information regarding subjective assessment of presence of any of the following symptoms:-

- TMJ pain, muscle pain or clicking during jaw movement, and facial pain by answers yes or no were obtained on a prepared case sheet.

This was followed by thorough oral examination to inspect the presence of TP and/or TM, presence of TMJ clicking, crepitation and muscular spasm to correlate the findings with the answers of individuals.

Statistical analysis
The variables were coded and the age and gender where grouped and the relationships were then analyzed using chi–square x test to find any statistical differences.

RESULTS
The prevalence of torus palatinus and torus mandibularis commonly encountered during prosthodontic treatment were studied in a sample of 932 persons. The sample distribution was clarified in table 1. The number and percentage of subjects having any kind of tori was 111 (11.9 %) those having maxillary tori were 49 (5.3 %) while the mandibular tori was present in 67 (7.2 %) persons the prevalence figures of both tori were fairly low, in accordance with former reports.

The prevalence of tori according to gender revealed a high percentage of tori in women compared with men as shown in table 1. The study revealed about 40 (6.3%) and 50 (7.9 %) women having maxillary tori and mandibular tori, respectively.

In those having both torus palatinus and torus mandibularis there was female predominance over men. The men who had mandibular tori were about 4.0 % while 1.3 % had maxillary tori, and those having both maxillary and mandibular tori were only 0.7 % as shown in table 1.

<table>
<thead>
<tr>
<th>Gender</th>
<th>No Tori Present</th>
<th>Tori present</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maxillary (94%)</td>
<td>Mandibular (67.7%)</td>
<td>Both Maxillary &amp; Mandibular (88.1%)</td>
</tr>
<tr>
<td>Men</td>
<td>283 (13%)</td>
<td>12 (4%)</td>
<td>4 (0.7%)</td>
</tr>
<tr>
<td>Women</td>
<td>538 (85.3%)</td>
<td>3 (0.5%)</td>
<td>50 (7.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>821 (88.1%)</td>
<td>44 (4.7%)</td>
<td>112 (5.5%)</td>
</tr>
</tbody>
</table>

\(X^2=17.495\) \(df=3\) \(\text{sig}=0.001\)

According to age, the results indicated an increase in the prevalence of mandibular tori with increase in age, while the prevalence according to each group is increased in the age of 50 and over 8.3 % as shown in table 2.
Table 2: Frequency and relative distribution of presence of tori according to age groups.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>No tori present</th>
<th>Max. tori present</th>
<th>Mand. Tori present</th>
<th>Max.&amp;Mand. Tori present</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>106 (83.5%)</td>
<td>13 (10.2%)</td>
<td>8 (6.3%)</td>
<td>-</td>
<td>127</td>
</tr>
<tr>
<td>30-39</td>
<td>269 (87.1%)</td>
<td>17 (5.5%)</td>
<td>20 (6.5%)</td>
<td>3 (1%)</td>
<td>309</td>
</tr>
<tr>
<td>40-49</td>
<td>346 (89.4%)</td>
<td>14 (3.6%)</td>
<td>25 (6.5%)</td>
<td>2 (0.5%)</td>
<td>373</td>
</tr>
<tr>
<td>50+</td>
<td>100 (91.7%)</td>
<td>-</td>
<td>9 (8.3%)</td>
<td>-</td>
<td>109</td>
</tr>
<tr>
<td>Total</td>
<td>821 (88.1%)</td>
<td>44 (4.7%)</td>
<td>62 (6.7%)</td>
<td>5 (0.5%)</td>
<td>932</td>
</tr>
</tbody>
</table>

X²=14.584 df 6 sig. 0.24

* maxillary and mandibular tori added to maxillary tori for low frequencies for the sake of statistical analysis.

The prevalence of maxillary tori decreased with the increase in age and the highest percentage appeared in the age group from 20-29 years which shown 10.2% 13 persons as shown in table 2.

Statistical analysis between maxillary tori and mandibular tori with the age of person using chi-square test revealed that there is significant differences at 0.024 level.

The presence of tori was related to condition associated with parafunctional activity in the form of TMJ dysfunction syndrome, the results revealed that there is increase in percentage of mandibular tori with the presence of TMJ dysfunctional syndrome more than maxillary tori. It’s about 17.7 % in mandibular tori while it’s 13.6 % in maxillary tori and those having both maxillary and mandibular tori shown more percentage of TMJ dysfunction (20%), the differences were statistically observed at 0.026 level as shown in table 3.

Table 3: Frequency and relative distribution of tori present according to TMJ dysfunction syndrome.

<table>
<thead>
<tr>
<th>Tori</th>
<th>TMJ Dysfunction</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not present</td>
<td>Present</td>
</tr>
<tr>
<td>No tori present</td>
<td>716 (87.2%)</td>
<td>105 (12.8%)</td>
</tr>
<tr>
<td>Max. tori</td>
<td>38 (86.4%)</td>
<td>6 (13.6%)</td>
</tr>
<tr>
<td>Mand. Tori</td>
<td>51 (82.3%)</td>
<td>11 (17.7%)</td>
</tr>
<tr>
<td>Both Max. &amp; Mand. Tori</td>
<td>4 (80%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Total</td>
<td>809 (86.8%)</td>
<td>123 (13.2%)</td>
</tr>
</tbody>
</table>

X² = 11.443 df 4 Sig 0.026

Both maxillary and mandibular tori added to maxillary tori for the sake of statistical analysis.

The relation between chronic disease with the presence of maxillary tori, mandibular tori and both maxillary and mandibular tori were studied, the results revealed that persons with both maxillary and mandibular tori having higher percentage (20%) of chronic disease as shown in table 4 , then the mandibular tori having 16.1% while the maxillary tori shown a small percentage (6.8%) only. statistical analysis between the chronic disease (presence and absent) with the presence of all types of tori indicated that there is no statistical significant differences between persons with or without chronic disease and presence of tori at 0.05 level.
DISCUSSION

Many dentists have patients in their practice with maxillary or mandibular exostoses, termed torus palatinus and torus mandibularis or both. The majority of this asymptomatic, benign bony outgrowth remains undisturbed over the patient’s life time. However the tori occasionally need to be removed. Analysis of prevalence of torus palatinus and torus mandibularis depending on the gender, revealed that the prevalence was statistically significant among women more than men and this result was explained by the recent theory of the cause of it’s occurrence due to genetic and environmental factors so the differences in these factors during life and it’s effect on the women more than men, so the differences happened between women and men (11). These results agreed with that of Eggens et al (14), and Shah et al (12), while Haugen (13) and Kerdpon (9), found that torus palatinus was more in female while the torus mandibularis is more predominant in male than female.

The majority of torus palatinus was present in the age group between 20-29 years and decreased with the advancement of age, while the torus mandibularis increased with the increase in age and the highest percentage was found in age of 50 years and over. These results maybe explained due to the increase in the force on the lower arch (mandible) due to bruxism and other parafunction activity where the effect appear on the mandible more than maxilla, these results agreed with that found by Haugen (13) when he found that prevalence of tori was highest in the 35-65 year age groups and relatively near the results found by Shah et al (12) which was indicated that prevalence of torus palatinus was more common in age group 11-30 years old.

TMJ dysfunction syndrome was studied by many researchers, especially the factors that may aids in its etiology and the effect of this syndrome in the cause of other phenomena like the relation between TP and TM with the presence of TMJ syndrome. So the significant relation that was found between TMJ syndrome and presence of TM and TP may be an indication that this syndrome may be a factor in the cause of TP and TM and this hypothesis agrees with our findings that persons having both maxillary and mandibular tori have more percentage of TMJ . These results agreed with the findings of Kerdpon (9) who found a strong association between clenching and grinding and the presence of TM was found, whereas Clifford et al (10) revealed that their results support as association with parafunction in the etiology of mandibular tori and suggest that tori are a useful marker of past or present parafunction which include tooth clenching or grinding, TMJ disorders and recently migraine in some patients.

Chronic diseases were in general not show a significant relation with the higher percentage in those having both maxillary and mandibular tori, chronic diseases and some drugs that are used for treatment may play a factor in the etiology of TM and TP like the findings of Sasaki et al (15) who revealed that the unusual tori may have been the result of chronic Phenytoin therapy, rather than association with the familial back ground .these chronic diseases may need a further study in detail of each disease with the drugs used in the treatment of these diseases.

REFERENCES

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