

**MDJ**

The Relationship of Tempromandibular joint disorders with Bony Exostosis in the Oral Cavity

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Abstract

The temporomandibular joint (TMJ) may be affected by inflammatory, traumatic, infectious, congenital, and developmental, as seen in other joints. However, the most common affliction of the TMJ and masticatory apparatus is a group of functional disorders with associated pain that occurs predominantly in women and was previously known as the TMJ pain dysfunction syndrome. Since 1978, there have been substantial changes in the study of etiologic factors, pathophysiology, diagnosis, and management of what are now called temporomandibular disorders (TMD).(1)The general perception that all symptoms in the head, face, and jaw region without an identifiable cause constitute a "TMJ" problem is clearly unfounded.

Although some oral lesions, such as torus palatinus and torus mandibularis are normal variants, but require prompt diagnosis and sometime treatment to reduce the potential for serious complication and enhance prosthodontic treatment. The purpose of this study is to inspect the relation of TMJ dysfunction syndrome to the presence of oral exostosis, and find the prevalence of torus palatinus (TP) and torus mandibularis (TM)

The sample consisted of 932 teachers, 301 males and 631 females were examined for the presence of TMD, TP and / or TM. Analysis was carried out according to age, gender, TMJ dysfunction and the presence of TP and TM.

Results indicated that 123(16.1%) had at least one symptoms of TMD, where as 49 (5.3%) had TP; and 67 (7.2) had TM. The male: female prevalence ratios of TP and TM were 1: 3.42 and 1: 1.81 respectively. The results revealed that significant relationship between TMD and tori, and increase in percentage of mandibular tori with the presence of TMJ dysfunctional syndrome more than maxillary tori were found.

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:- Temporomandibular joint disorders (TMD), Torus Palatinus (TP), Torus Mandibularis (TM).

Introduction

TMJ" disorders are a group of conditions that cause pain and dysfunction in the temporomandibular joint and the muscles that control jaw

movement. They are more common in women than men(1).

Patients with temporomandibular disorders most frequently present with

pain, limited or asymmetric mandibular motion, and TMJ sounds(2) The pain or discomfort is often localized to the jaw, TMJ, and muscles of mastication. Common associated symptoms include ear pain and stuffiness, tinnitus, dizziness, neck pain, and headache. In some cases, the onset is acute and symptoms are mild and self-limiting. In other patients, a chronic temporomandibular disorder develops, with persistent pain and physical, behavioral, psychological, and psychosocial symptoms similar to those of patients with chronic pain syndromes in other areas of the body (3)

Temporomandibular disorders are most commonly reported in young to middle-aged adults (20 to 50 years of age)(4). The most common symptom reported by patients with temporomandibular disorders is unilateral facial pain.

In general tori are a hyper plastic over growth 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 vary in quality and quantity, they vary in size.(5)

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 (5).

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 is 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.(6.7). Brunsvold et al 1995(8) follows up the recurrence of mandibular tori after surgical removal, and they found that recurrence of mandibular tori may happen after removal.

Although there is not a consensus on their etiology, many associate their occurrence with TMDs and masticatory hyperfunction.(9)The author has long suggested that the compression of collagen in the dentition and bone generates negative ions that result in exostosis .(10)

The prevalence and features of palatal tori were observed in many studies, Sonnier; (1999) (9) found that higher prevalence among males. Mandibular tori were observed in 27 % of all skulls with higher prevalence seen among males also.

Kerdpon; (1999) (10) found that 61.7 % had TP where as 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 frequent in females. A strong association between clenching and grinding and the presence of TM was found, so the presence of TM might be useful as a clue to look for signs of parafunction.

Cliffard et al (1996) (11) were found that mandibular tori were present significantly more commonly in both migraineurs and temporomandibular disorders (TMD) patients. The results support the association with parafunction in the etiology of mandibular tori.

Eggen and Natvig. In (1994)(12) 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. Differences in the prevalence of tori between genders have also been reported. Most authors reported TP was more frequent in females, while TM affected more males than females.

Shah-et al; (1992)(13) 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 – 30) years and rarely seen before 10 years of age.

Haugen – (1992)(14) shown that the prevalence figures of torus palatinus predominance in female with a sex ratio of 5: 3, where as in torus mandibularis the males were in majority and the sex proportion was 4: 3. In both sexes prevalence of the two tori was highest in the 35 – 65 years age group.

Aim of the Study

The objectives of the present study: -

- 1- To find out the relationship between the presence of oral exostosis and TMJ dysfunction syndrome.
- 2-Observe the prevalence of torus palatinus and torus mandibularis among Iraqi teachers and investigate their association with age and gender.

Materials and Methods

The sample consisted of 932 teachers, 301 males and 631 females aged 20 years and over in the area of Baghdad-Iraq, they were interviewed and examined. The subjects were divided into four age groups: 20-29, 30-39,40-49and 50 years and over. A short medical history was obtained including presence of any chronic diseases, medical complaints or drug intake. Information regarding

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

TMJ pain, muscle pain, or clicking during jaw movement, facial pain and headache by answers yes or no was obtained on a prepared case sheet. The person can choose more than one symptom if had. The criteria was used according to Wassell et al (2006) who used the diagnosis of TMD according to International Headache Society(1988) and American Academy of Craniomandibular Disorder(1990).(15)subjects being 18 years or older, the presence of pain in TMJ, muscles or both, plus one or more of the following: which are the key criteria on clinical examination:-

- 1-Pain on muscle palpation and rigidity of the jaw.
- 2-Reproducible click on opening and closing, with history of joint noise.
- 3-Tenderness of TMJ with range of motion limited by pain.
- 4-Facial pain and headache, which are the common complaints of patients with TMD.(16)

This was followed by thorough oral examination to inspect the presence of TP and/or TM. The presence or absence of tori was assessed by clinical inspection, and digital palpation, Physical examination should include observation of mandibular motion, palpation of the muscles of mastication (masseter, temporalis, medial and lateral pterygoid muscles) palpation of the TMJ, and presence of TMJ clicking, crepitation .A diagnosis of TMD can be made if the patient exhibits more than one of the mentioned signs and/or symptoms.

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

In this study the common occurrence of various subjective symptoms and objective signs of temporomandibular dysfunction syndrome among teachers has been shown in Table (1). It revealed over representation of women in almost all symptoms of TMD. The most common symptoms include facial pain 75(60.9%), followed by masticatory muscle pain 57(46.3%). A number of Signs of dysfunction were noted at the clinical examination with that reported by the individuals.

The presence of tori was related to the TMJ dysfunction syndrome (TMD), 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 (2).

The prevalence of torus palatinus and torus mandibularis commonly encountered during prosthodontic treatment were studied in the sample of 932 teachers. The sample distribution was clarified in table (3). 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, a high percentage of tori was present in women compared with men as shown in table (3), 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 that have 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 (3).

Statistical analysis between tori (maxillary, mandibular, and both maxillary and mandibular) with gender using chi-square test revealed that there is a higher significant differences at 0.001 level.

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 (4).

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 (4) .

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

Discussion

Temporomandibular disorders (TMDs) have signs and symptoms that affect the masticatory muscles, **temporomandibular** joint (TMJ) or both. These signs and symptoms include complaints of TMJ pain, tenderness to palpation on the muscles of mastication, uncoordinated mandibular movement and the presence of joint sounds.(17)

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 TMD. These results agreed with the findings of Kerdpon ; 1999((10), who found a strong association between clenching and grinding and the presence of TM was found, whereas Clifford et al (1996)(11) revealed that their results support an 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. Sirirungrojying and Song Khln1999(18), reported that there was no significant difference in prevalence of torus palatinus (TP) between TMD and control group ($P = 0.2$), while torus mandibularis (TM) was more common in TMD than in control group ($P < 0.0005$). TM might be useful as an indicator of increased risk of TMD in some patients.

Many dentists have patients in their practice with max. Or mand. exostosis, termed torus palatinus and torus mandibularis or both. The majority of these asymptomatic, benign bony outgrowth remain undisturbed over the patients life time. However the tori occasionally need to be removed. Analysis of prevalence of torus palatinus and torus mandibularis depending on 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 its occurrence due to genetic and environmental factors so the differences in these

factors during life and its effect on the women more than men, so the differences happened between women and men (10), these results agreed with that of Eggens et al (1994)(12), and Shah et al; 1992 (13), while Haugen ;(1992)(14) and Kerdpon,(1999)(10), found that torus palatinus was more in female while the torus mandibularis is more predominant in male than female. SUGIHARA et al(19) reported in their study that the risk factors for mandibular lingual torus were gender, number of sound teeth, and bruxism, and the palatal torus were gender and TMJ symptoms. Our results were not in agreement with most previous studies in showing that TP is more common in females, while TM is more common in males. The prevalence ratios of males to females for TP and TM in this study are also not in accordance with other studies. Our study shows that male /female ratio were 1: 3.4 and 1: 1.8 times, for TP and TM respectively.

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, Yuiko et al (2008)(20) suggested that mandibular tori are promoted by masticatory stress and other factors correlated with age. these results agreed with that found by Haugen (1992)(14) 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,(1992)(13) which was indicated that prevalence of torus palatinus was more common in age

group 11-30 years old . Both types of exostosis tended to increase in frequency with age, Pechenkina and Benfer (2002)(21)on their study conclude that formation of exostosis is a complex process that can be invoked by any agent causing damage and inflammation of gingival tissue. However, severe occlusal stress, which is often manifested in TMJ disorder, is the main environmental factor leading to exostosis development in genetically predisposed individuals.

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Table (1):- Frequency & Relative distribution of individuals associated with one or more of TMD

Teachers sample		TMD	TMJ pain	Masticatory Muscle pain	Joint noises (clicking)	Head and facial pain
Men	301 (32.3%)	38 (30.9%)	23 (46%)	19 (33.3%)	29 (59.2%)	35 (46.6%)
Women	631 (67.7%)	85 (69.1%)	27 (54%)	38 (66.6%)	20 (40.8%)	40 (53.3%)
Total	932 (100%)	123 (100%)	50 (40.7%)	57 (46.3%)	49 (39.8%)	75 (60.9%)

Table (2):Frequency & Relative distribution of tori present according to TMJ dysfunction Syndrome .

Tori	TMJ dysfunction		Total
	Not present	present	
No tori present	716 (87 . 2 %)	105 (12 . 8 %)	821 (88 . 1 %)
Max .tori	38 (86 . 4 %)	6 (13 . 6 %)	44 (4 . 7 %)
Mand .tori	51 (82 . 3 %)	11 (17 . 7 %)	62 (6 . 7 %)
Both Max. &Mand. Tori	4 (80 . 0 %)	1 (20 . 0 %)	5 (0 . 5 %)
Total	809 (86 . 8 %)	123 (13 . 2 %)	932 (100 . 0 %)

$X^2 = 11.443$ df 4 Sig 0.026

Both max. & mand . tori added to max . tori for the sake of statistical analysis.

Table (3): Number and percentage of subjects having tori according to sex.

Sex	No Tori present	Tori present			Total
		Maxillary	Mandibular	Both Max. &Mand.	
Men	283 (94.0 %)	4 (1.3)	12 (4.0)	2 (0.7)	301 (32.3 %)
Women	538 (85.3 %)	40 (6.3 %)	50 (7.9 %)	3 (0.5 %)	631 (67.7 %)
Total	821 (88.1 %)	44 (4.7 %)	62 (6.7 %)	5 (0.5 %)	932 (100.0 %)

$X^2=17.495$ df 3 sig=0.001

Table (4): Frequency and relative distribution of presence of tori according to Age groups.

Age group (years)	Tori				Total
	No tori present	Max. tori present	Mand.tori present	Max. &Mand tori present	
(20 – 29)	106 (83 . 5 %)	13 (10.2 %)	8 (6 . 3 %)	- -	127 (13 . 6 %)
(30 – 39)	269 (87 . 1 %)	17 (5 . 5 %)	20 (6 . 5 %)	3 (1 . 0 %)	309 (33 . 2 %)
(40 – 49)	346 (89 . 4 %)	14 (3 . 6 %)	25 (6 . 5 %)	2 (0 . 5 %)	387 (41 . 5 %)
(50 +)	100 (91 . 7 %)	- -	9 (8 . 3 %)	- -	109 (11 . 7 %)
Total	821 (88 . 1 %)	44 (4 . 7 %)	62 (6 . 7 %)	5 (0 . 5 %)	932 (100 . 0 %)

$\chi^2=14.584$ df 6 sig. 0.24

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