Original Article

Prevalence of temporomandibular disorders among patients referred to Shaheid Beheshti Dental School, Iran (2007-2008)

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Abstract

Statement of the problem: Temporomandibular disorders (TMDs) include a wide range of diseases such as masticatory muscles and temporomandibular joint (TMJ) dysfunctions. The aim of this study is to determine the prevalence of temporomandibular disorders among patients who referred to the Oral and Maxillofacial Surgery Department of Shaheed Beheshti Dental School, Iran, 2007-2008.

Methods and Materials: The study was a descriptive survey performed through filling the questionnaire by observation, interview and examination. The study population consisted of all patients who referred to the Oral and Maxillofacial Surgery Department of Shaheed Beheshti Dental School during 2007 and 2008. One thousand over 12 year old patients were inspected. Determinants of the study were age, sex, TMJ muscular pain, limitations in opening, presence of clicking and crepitus, type of occlusion and occlusal interferences.

Results: Among the study population, 91% showed at least one temporomandibular disorder sign and symptom.The prevalence of Temporomandibular disorders was more common in women (61%) compared to men (39%). TMDs prevalence in different age groups was 29.4% in fewer than 27year olds, 40.1% in 27-45, and 30.5% in over 45 year olds.

Conclusion: The prevalence of temporomandibular disorders was high in the study population especially in women and middle aged patients.

Keywords: Temporomandibular Joint Disorders, TemporomandibularJjoint, Tinnitus, Crepitus.

INTRODUCTION

Temporomandibular disorders include different clinical situations that most of the time intermingles with each other. TMDs (Temporo - Mandibular Disorders) can involve the TMJ (Temporo-Mandibular Joint) and neuromuscular system. Signs of TMDs include pain, tenderness in masticatory muscles and TMJ, joint noises during the mandibular movements such as clicking, crepitus and limited mouth opening.[1,2]

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Many epidemiological researches have been done all over the world studying the prevalence of TMDs in different populations. Ozan et al. performed a research about the prevalence of signs and symptoms of TMDs in a 792-person Turkish population group with the age range of 15 to 72 years old. According to subjective findings, there were significant differences ($P<0.05$) between genders presenting all symptoms except hearing clicking ($P=0.05$). There were no differences between clicking and crepitus in terms of sounds of TMJ. On the contrary, there were significant differences ($P<0.05$) between the tenderness of at least one masticatory muscle. Muscles were not studied separately and only muscle pain was taken into consideration. [3] In 2007, Cooper and Kleinberg studied the presence of signs and symptoms of TMDs among a large population of 4528 patients with the chief complaint of TMDs over a 25-year-period. All patients had at least one of the symptoms but only 190 patients showed all signs during examination. The most common symptoms reported included pain (%96.1), headache (%79.3), TMJ dysfunction (%75) and peri-auricular disorders (%82.4). Among patients who had signs, the most common sign was tenderness in the pterygoid muscle (%85.1) followed by joint tenderness (%62.4). Most of the time, signs and symptoms were accompanied by problems in mandibular movement, joint noises and dental problems such as attrition or increased overbite. [4] Marklund and Wanman studied 371 Swedish dental students in 2007 to see if they had TMJ pain and dysfunction while 308 patients were reexamined the following year. The incidence of sign and symptoms during the mentioned period was %12 without any significant differences between men and women. The most common signs reported were joint noises (%10) and pain (%8) although 25% showed healing during the year. There were fewer problems among men, patients with bilateral contact in central relation, people with normal transverse jaw relationship and stable mandibular position in centric occlusion. The continuous occurrence of signs and symptoms was gender-dependent while their elimination was not so. [5] Feteih studied the signs and symptoms of TMDs and oral para-functions in Urban Saudi Arabian adolescents in 2006. After clinical examination, the questionnaire was completed for a total of 358 (230 females and 155 males) school-aged children. The results showed that 21.3% of the subjects exhibited at least one sign of TMDs and females were generally more affected than males. Joint sounds were the most frequent sign (13.5%) followed by restricted opening (4.7%) and opening deviation (3.9%).The amplitude of mouth opening, with overbite taken into consideration, was 46.5mm and 50.2 in females and males, respectively. TMJ pain and muscle tenderness were rare (0.5%). Reported symptoms were 33%,

headache being the most frequent symptom (22%), followed by pain during chewing (14%) and having the noises (8.7%). Difficulty during jaw opening was rare. Lip/cheek biting was the most common para-functional habit (41%) with females significantly more than males, followed by nail biting (29%). Bruxism and thumb sucking being only 7.4% and 7.8%, respectively (6). Bonjardim et al. in 2005 studied the signs and symptoms of TMDs in adolescents. The sample comprised of 217 subjects, aged 12 to 18.The results of this study showed that pterygoid lateralis muscle tenderness was the most frequent sign for the palpation index, found in 32.25% of the total sample. The most frequent sign of dysfunction index was TMJ sounds (mouth opening), occurring in 19.8% of the total sample. The most prevalent symptom was TMJ sound (26.72%) followed by headache (21.65%).There was no statistical association between genders in clinical signs and symptoms, except for pterygoid lateralis muscle tenderness which presented a higher prevalence among girls.[7] Gesch et al. studied the prevalence of signs and symptoms of TMDs in an urban and a rural German population in the age range of 18-81 years in 2004. Half of the subjects (49.9%) had one or more clinical signs of TMDs, but only 2.7% were subjectively aware of TMJ pain symptoms. Women showed higher frequency for all signs and symptoms than men. However, these differences were not significant for all signs and symptoms in all age groups. The results showed the prevalence of signs and symptoms as follows: TMJ tenderness to palpation (5%), masticatory muscle tenderness (15%), joint sounds (25%), limited maximum mouth opening <40mm (9%), pain upon movement of mandible (1%), irregular jaw movement (deviation, deflection) (28 %). [8] Esposito et al. studied 425 patients with TMDs in 2000. Among the study group, 84% were females, 84% had pain in the muscular system from which 42% had bilateral pain and the rest had unilateral pain. Headache was present in 78% of cases and clicking during closing mouth in 31%. [9] Mongini et al. performed a survey on 243 cases in Italy in 2000.The prevalence of TMDs was 71%, from which 68% had migraine and 26% had had headache. They concluded that the prevalence of TMDs was more common in people with psychotic problems.[10] Magnusson et al. did an epidemiological study in Sweden in 2000. 24 adolescents in the age group of 15-35 were studied and followed for 20 years .The prevalence of TMDs in different age groups was very different and 13% of them showed at least one of the TMDs signs. Muscular pain and headache were more common in females and joint pain was more prevalent in men. [11] The aim of this study was to determine the Prevalence of temporomandibular disorders among patients who referred to Oral and Maxillofacial Surgery Department

of Shaheed Beheshti Dental School, Iran, 2007-2008.

METHODS AND MATERIALS

This was a descriptive study performed through observation, interview and examination. The study population consisted of all patients who referred to the Oral and Maxillofacial Surgery Department of Shaheed Beheshti Dental School during 2007 and 2008 and had expressed their willingness to cooperate in the study. One thousand over 12 year old patients were inspected.

The examinations were done according to the instructions explained by Peterson. [(2)] At first, masticatory muscles including masseter, temporalis, pterygoid medialis and lateralis were inspected followed by the examination of the neck muscles. Extra-oral palpation of masseter was done by thumb and index fingers and the two sides were compared. Pterygoid lateralis was touched by putting the index finger behind the maxillary tuberosity while the patient's mouth was semi-opened and mandible was protruded. Bilateral tenderness was marked as a sign of Temporomandibular disorder. The palpation of pterygoid medialis was fulfilled by touching the mandibular lingual angle intra and extra-orally. When pain was present, neck muscles were examined too. The anterior part of the temporalis muscle was palpated on the zygomatic arch in front of TMJ while the middle and posterior transverse parts were inspected in the upper and back regions.

Secondly, the TMJ was examined internally and externally. The process of opening and closing the mouth was studied by putting the fingers on the tragus and in the external auditory meat us and the presence of clicking, crepitus, tenderness and pain was determined. Arbitrary maximum opening was gauged by measuring the distance between upper and lower right incisors. Maximum opening less than 40 mm and maximum lateral and protrusive movement less than 10 mm were considered as limitations. Differences between centric occlusion and centric relation were recorded by observing the difference between anterior overjet during maximum inter-cuspation and mandibular retrusion. Also, the patients were asked if they had habits such as bruxism and clenching.

Under the study situation some determinants such as age, sex, TMJ muscular pain, limitations in mandible movement, presence of clicking and crepitus, type of occlusion and occlusal interferences were inspected.

RESULTS

Pain during the palpation of masicatory muscles showed that among all cases, 142(14%) expressed pain in masseter while 858(86%) didn't. 46(5%), 24(2%) and 122(12%) of patients had pain when touched, respectively, in the temporalis, pterygoid medialis and pterygoid lateral is muscles. Analysis of the pain during palpation according to age, sex and the side

involved is shown in Table 1. None of the cases felt tenderness during palpation of sternokleido mastoid muscle while one of them had pain in the trapezius muscle.

There were 233(23%) limitations, 260(were opened under pressure), respectively 112(11%), 253(25%) and 52(5%) had limitation, deviation and pain. In protrusive, right lateral and left lateral movements of mandible, the statistics were 431(43%), 648(65%) and 637(64%) limitations and 34 (3%), 53(5%) and 59(6%) occlusal interferences.

Joint noises (clicking and crepitus) were heard in 686(69%) consisting of 56% women, 44% men, 12.5% right side involvement, 43% left side involvement, 44.5% both side involvements, 20% under 27 year olds, 54% between 27-45 and 26% over 45 year olds.

Occlusion type distribution is mentioned in Table 2. There were 153(15%) people with differences between centric occlusion and centric relation with the sex composition of 34% female and 66% male.

Four Hundreds and zero five (49.5%) patients mentioned that they had bruxism 64% of whom were women and 36% were men.

The statistics about tenderness during TMJ palpation and its age, sex and side distribution are shown in Tables 3 and 4.

Finally, the results suggested that from 1000 cases 910 had at least one of the TMDs signs and symptoms introducing a TMDs prevalence of 91%. Generally, women with the probability of 61% were more likely to suffer temporomandibular disorders than men (39%). TMDs prevalence among different age groups was 29.4%, 40.1% and 30.5% for less than 27, 27-45 and over 45 year olds.

Table 1: Analyzing pain in different muscles during palpation according to age, sex and the side involved

Muscle	sex		age			side		
	female	male	Under 27	27-45	Over 45	right	left	both
Masseter n=142	72 (51%)	70 (49%)	45 (32%)	62 (44%)	34 (24%)	56 (40%)	40 (28%)	45 (32%)
Temporalis n=46	31 (67%)	15 (33%)	10 (23%)	26 (54%)	10 (23%)	5 (12%)	25 (55%)	16 (33%)
Pterygoid Med n= 24	17 (72%)	7 (28%)	7 (29%)	10 (42%)	7 (29%)	7 (30%)	7 (31%)	10 (39%)
Pterygoid Lat n=122	73 (60%)	49 (40%)	34 (28%)	50 (41%)	38 (31%)	59 (48%)	30 (25%)	23 (27%)
Overall	193 (57%)	141 (43%)	96 (29%)	148 (44%)	79 (28%)	126 (38%)	102 (31%)	104 (31%)

Table 2: Distribution of occlusion type in gender

Type of occlusion	Female	Male
Class I 584(58%)	53%	47%
Class II 184(18%)	54%	46%
Class III 211(21%)	52%	48%

Table 3: Distribution of tenderness during TMJ palpation

Palpation	External palpation				Internal palpation			
Movement	Without movement		During movement		Without movement		During movement	
Pain	No pain	Pain	No pain	Pain	No pain	Pain	No pain	Pain
Net frequency	979	21	944	56	977	23	907	93
Relative frequency	98	2	94	6	98	2	91	9

Table 4: Age, sex distribution and side of TMJ tenderness during palpation

Palpation	Movement	Gender		Age			Side involved		
		Female	Male	Under 27	27-45	Over 45	Right	Left	Both
External palpation	Without movement n=21	67%	33%	46%	39%	15%	17%	8%	75%
	During movement n=56	67%	33%	36%	40%	24%	23%	12.5 %	64.5 %
Internal palpation	Without movement n=23	58%	42%	45%	40%	15%	25%	10%	65%
	During movement n=93	59%	41%	35%	42%	23%	30%	13%	57%

DISCUSSION

The aim of this study was to evaluate the signs and symptoms of TMDs in patients who referred to the Oral and Maxillofacial Surgery Department of Shaheed Beheshti Dental School. The present study has shown that the prevalence of at least one sign of TMDs was 91%, and perhaps the high prevalence of some subjective and objective findings existed because of orofacial disorders other than TMDs.

In 2006 Feteih studied 12-16 year old adolescents and the results showed that 21.3% of the subjects exhibited at least one sign of TMDs. Also, in 2004 Gesch et al. [8] studied the prevalence of TMDs in an urban and rural German population in the age group of 20-81 year olds .They showed that at least 49.9% of the cases had one or more clinical signs of TMDs. In 2000, Mongini et al. [10] reported a 71% prevalence for TMDs in Italy and Magnusson et al. [11] performed an epidemiological research on an age group of 15 to 35 and showed that 13% of all had at least one of the TMDs signs. The difference in results of various studies might be because of various studied population and the different analysis methods.

In this study, the prevalence of TMDs was found to be higher in women than men. Previous studies such as Ozan et al. (2007) [3], Feteih (2006), Eposito et al. (2000) [9], Magnusson et al. (2000) [11] reported the same. The higher prevalence of TMDs in women can be related to the typical physiological differences between females and males such as regular hormonal variations, muscular structure, and different characteristics of conjunctive tissue.

In this study, we found that the age group 27-45 was the most common group to have TMDs signs. Maybe it is because of having more responsibility in family, society and labor and bearing more stress but in other studies there wasn't the same classification of age groups.

This study determined that during the masseter, temporalis, pterigoid medialis, and pterygoid lateralis palpations, they have pain by 14%, 5%, 2%, 12% respectively. In addition, during facultative mouth opening 23% of cases had restriction, 26% had deviation, and 4% had pain. The present study also showed that 69% had joint noises (click, crepitus) and 40% had bruxism. Feteih (2006) showed that in the age group of 12-16 year olds, the most common signs of TMDs were joint noises (13.5%) followed by restricted mouth opening (4.6%), deviation (3.9%), pain and tenderness (0.5%) and para-functional habits such as lip and cheek biting (41%), nail biting (29%), bruxism (7.4%) and thumb sucking (7.8%). In Marklunt's study (2007) done on dental students, joint noises and pain were 10% and 8%, respectively. Bonjardim (2005) showed that the most frequent sign of TMDs in adolescents was tenderness in pterygoid lateralis(32.25%) followed by joint noises (26.72%) and headache (21.65%) (7). Gesche (2004)

showed that in a German group of older than 20 years, tenderness in TMJ was 5%, tenderness in masseter was 0.5%, restriction in mouth opening was 9% ,pain during mandibular movement was 1% and irregular jaw movement (deflection, deviation) was 28%. [8] Eposito et al. (2000) reported that the prevalence of clicking in patients with TMDs during mouth opening was 54% and during mouth closing was 31%. [9]

Maybe the differences between the results of various studies are because of the different groups and different analysis methods.

CONCLUSION

Based on the results presented above, it was concluded that clinical signs and symptoms of TMDs were present in patients who referred to the Oral and Maxillofacial Surgery Department of Shaheed Beheshti Dental School in 2007-2008 and they were more common in the age group of 27-45 years.

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