RETROSPECTIVE STUDY OF A SERIES OF 203 PATIENTS WITH TEMPOROMANDIBULAR JOINT DISORDERS PRESENTING AT SCHOOL OF DENTISTRY, UNIVERSITY OF SULAIMANI

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Abstract

Background: Temporomandibular Disorders (TMDs) constitute a complex and heterogeneous group of conditions and clinical problems that involve the temporomandibular joint (TMJ) and the masticatory musculature. TMD are an important challenge for dental profession because is a field of dentistry with many controversies in the aetiopatogenesis, diagnosis and treatment

Objective: This study was designed to analyze 203 patients with temporomandibular joint disorders according to age, sex and possible etiological factors

Method: A retrospective study was done among 203 patients attending School of Dentistry, University of Sulaimani, between January 2007 and December 2011. The age range was between 10-79 years. About 86 (42.36%) of patients were males and 117 (57.63%) were females. The male/female ratio was 0.73:1. Personal informations, including age, sex, reason for consultation, occupation as well as sign and symptoms, and possible etiological factors for temporomandibular joint disorder were registered. Chi Square test was used to analyze the data.

Result: The most commonly affected age group was 20-29 and 30-39 year old (63.05, 13.30, respectively), temporomandibular joint disorders was more common among females (57.63%) than males (42.36%). Pain was the most common reason for consultation (53.18%), the majority of patients were student (64.03), the most common sign was clicking (77.83%), the most common etiological factors for temporomandibular joint disorders were

habit (70.44%), followed by stress (44.33%) and abnormal occlusion (37.93%). Habit and stress were more common among females (73.50%, 45.29%, respectively) than males (63.95%, 43.02%, respectively) while occlusal abnormality was more common among males (40.69%) than females (35.89%). however sex differences for both males and females was not significant

Conclusion: The authors concluded that the majority of patients with temporomamdibular joint disorders were young aged and females; etiology of temporomandibular joint disorders are multifactorial including habit, stress and abnormal occlusion; therefore treatment should be tailored for each patients accordingly, stress management interventions suggested to be beneficial in reducing the sign and symptoms of temporomandibular joint disorders

Keyword: Temporomandibular joint disorder, pain, habit, clicking, stress

Introduction

Temporomandibular joint disorder (TMJDs) refers to a cluster of conditions characterized by pain in the TMJ or its surrounding tissues, functional limitations of the mandible, or clicking in the TMJ during motion (Koh and Robinson, 2004). Among the most common pain in general population, stand out temporomandibular disorder (TMD) which is the most common cause of pain in the orofacial region of non-dental origin (Magnusson et al 2000). The prevalence of TMDs has been reported to be from 6% to 68% in various studies (Poveda et al 2007) with higher prevalence among woman (Poveda-Roda et al 2009; Poveda-Roda et al 2012). The prevalence is low in young children but increases with age in adolescence up to young adulthood (Egermark et al 2001). It is generally accepted that the etiology of temporomandibular joint disorders (TMD) is multifactorial, and is related to a number of dental and medical conditions, such as occlusion, posture, parafunctional habits, restorative procedures, orthodontic treatment, emotional stress, trauma, and anatomy of the disc, pathophysiology of the muscles, genetic and psychosocial factors, age, and gender (Cooper and Kleinberg 2007) . Typical signs and symptoms of TMD are pain, limited mouth opening, joint sounds, mandibular deviation, and chewing disability (Cooper and Kleinberg 2007), muscle tenderness (Sonmez et al 2001) and headache (Vierola et al 2012). Aural symptoms such as tinnitus, otalgia, dizziness or vertigo, otic fullness sensation, hyperacousia or hypoacousia are thought to be associated with TMD (Ramirez et al 2007), Pain is the most important symptom of TMD for both patients and clinicians, as it is often the main reason why patients seek for medical help (Dao and LeResche, 2000). TMD diagnosis is mainly clinical

and maybe supplemented by images (Shintaku et al 2006). There is a paucity of data regarding the clinical analysis of patients with TMJDs attending our clinic for seeking medical care therefore; this study was designed to analyze 203 patients with TMJDs that were seen in the oral diagnosis clinic of school of dentistry, university of sulaimani, according to age, sex and possible etiological factors.

PATIENTS AND METHODS

A retrospective study was done among 203 patients with TMJDs attending oral diagnosis clinic of School of Dentistry, University of Sulaimani, between January 2007 and December 2011. This research was approved by the Committee of Ethics in Research of the University of Sulaimani. According to declaration of Helsinki, signed consent forms were obtained from all patients before conducting the study. Case files of these patients are retrieved and the personal informations including age, sex, reason for consultation and occupation (Student, house wife, general worker, white collar worker, blue collar workers, and others) were recorded. Information regarding the sign and symptoms of TMJDs including pain during eating, headache and ear symptoms, examination of TMJ for pain, sounds such as clicking, examination of muscles of mastication for tenderness were also collected. Possible etiolologcal factors [Stress, habits (clenching, teeth grinding, gum chewing, nail objects, unilateral chewing, lip or cheek biting), history of previous trauma (trauma by dental work or trauma to head and neck), abnormal occlusion] were also recorded. Collected data were analyzed using a software package SPSS program version 16. Associations between categorical variables were tested using chi-square test; Statistical significance was set at $P < 0.05$.

RESULTS

The retrospective study comprised 203 patients, the age range of patients were between 10-79 years with mean age ± SD= 27.27.± 9.75. About 86 (42.36%) of patients were males and 117 (57.63%) were females. The male/female ratio was 0.73:1. The most commonly affected age group was 20-29 and 30-39 year old (63.05, 13.30, respectively), followed by 10-19 and 40-49 year old (10.83, 8.86, respectively), these two age groups (20-29, 30-39) showed the majority of patients with TMJDs (63.05%, 13.30%, respectively), overall, 76.35% of patients were in these two age groups, while only minority of cases were seen in 70-79 year old (0.49). TMJDs was more common among females (57.63%) than males (42.36%). (Table 1).

Table 1: Age and sex distribution of all patients

Age group	Male N (%)	Female N(%)	Total N (%)
10-19	12 (54.54)	10 (45.45)	22 (10.83)
20-29	55 (42.96)	73 (57.03)	128 (63.05)
30-39	12 (44.44)	15 (55.55)	27 (13.30)
40-49	5 (27.77)	13 (72.22)	18 (8.86)
50-59	1 (20)	4 (80)	5 (2.46)
60-69	1 (50)	1 (50)	2 (0.98)
70-79	0(00.00)	1(100)	1 (0.49)
Total	86 (42.36)	117 (57.63)	203 (100)

Regarding reason for consultations, on considering pain and sounds both isolated and in combination, pain was the most common reason for consultation (53.18%) followed by joint sounds (43.33%).

The majority of patients with TMJ disorders was student (64.03), followed by house wife (14.28), white collar worker (10.34%) and general workers (7.38) (Table 2).

Table 2: Distribution of patients according to reasons for consultation and occupation:

Reasons for consultation	Sex		Total
	Male N=86 N %	Female N= 117 N %	203 N %
Pain	34 (39.53)	57 (48.71)	91 (44.82)
Sounds	32 (37.20)	38 (32.47)	70 (34.48)
Pain and sound	8 (9.30)	7 (5.98)	15 (7.38)
Night grinding	9 (10.46)	6 (5.12)	15 (7.38)
Limitation	3 (3.48)	5 (4.27)	8 (3.94)
Sound and limitation	0 (00.00)	2 (1.70)	2 (0.98)
Pain and limitation	0 (00.00)	1(0.85)	1(0.49)
Pain, sound and limitation	0 (00.00)	1 (0.85)	1 (0.49)
Total	86 (100)	117 (100)	203 (100)
Occupation			
Student	56 (65.11)	74 (63.24)	130 (64.03)
House wife	00 (00.00)	29 (24.78)	29 (14.28)
White collar worker	12(13.95)	9 (7.69)	21(10.34)
General worker	10 (11.62)	5 (4.27)	15 (7.38)
Blue collar worker	3 (3.48)	0 (00.00)	3 (1.47)
Others	5 (5.81)	0 (00.00)	5 (2.46)
Total	86 (100)	117 (100)	203 (100)

Regarding signs and symptoms of TMJD, during clinical examination, approximately 77.83% of patients had clicking, TMJ pain was observed in 71.92%, Tenderness in one or more of muscles of mastication was reported in 54.18% of patients. Approximately 53.20% of patients had pain during eating, headache was seen in 40.39% of patients, and ear symptoms were observed in 39.90% of patients (Table 3).

Table 3. Percentage distribution of sign and symptoms of TMJ disorder

Variable	No. (%)
Clicking	158 (77.83)
TMJ Pain	146 (71.92)
Tenderness in muscles of mastication	110 (54.18)
Pain during eating	108 (53.20)
Headache	82 (40.39)
Ear symptom	81 (39.90)

Regarding possible etiological factors of TMJDs among patients, habits were recorded in 70.44% of the study sample followed by stress (44.33%), and abnormal occlusion (37.93%). Habits and stress were more common among females (73.50%, 45.29%, respectively) than males (63.95%, 43.02%, respectively) while occlusal abnormality was more common among males (40.69%) than females (35.89%).

Unilateral chewing was recorded in 33% of all patients followed by teeth grinding (19.70%), gum chewing (19.21%), clenching (18.71%), lip or cheek biting (18.22%) and nail objects (10.34%). Unilateral chewing, teeth grinding, and nail objects were more common among females (35.89%, 24.78% and 11.11%, respectively) than males (29.06%, 12.79% and 9.30%, respectively) while gum chewing, clenching and lip or cheek biting were more common among males (22.09%, 19.76% and 22.09% respectively) than females (17.09%, 17.94%, and 15.38%, respectively). History of previous trauma was recorded in 22.16%, it was more common among males (25.58%) than females (19.65%), however chi square test for all possible etiological factors of TMJDs about sex differences was not significant (Table 4).

Table 4: Possible etiological factors of TMJ disorder among patients

Risk Factors*	Male N (%)	Female N (%)	P-value	Total N (%)
Habits	55 (63.95)	86 (73.50)	0.15	143 (70.44)
Stress	37 (43.02)	53 (45.29)	0.74	90 (44.33)
Unilateral chewing	25(29.06)	42 (35.89)	0.30	67(33.00)
Teeth Grinding	11 (12.79)	29 (24.78)	0.05	40 (19.70)
Gum chewing	19 (22.09)	20 (17.09)	0.37	39 19.21)
Clenching	17 (19.76)	21 (17.94)	0.74	38 (18.71)
Lip or cheek biting	19 (22.09)	18 (15.38)	0.22	37 (18.22)
Nail objects	8 (9.30)	13 (11.11)	0.67	21 (10.34)
abnormal occlusion	35 (40.69)	42 (35.89)	0.48	77 (37.93)
History of previous trauma	22 (25.58)	23(19.65)	0.09	45 (22.16)

*Majority of patients have more than one risk factors therefore the total number of all risk factors are much more than the total number of patients.

Discussion

Epidemiological studies in the past few years showed that the majority of patients with TMJDs are young and middle aged adults (Gremillion 2000). In this study the most commonly affected age group was 20-29, 30-39 years. The higher frequency of TMD between 21 and 40 years of age over the older age groups was considered suggestive of the influence of psychological tensions that are inherent to the time of greatest productivity of these individuals, over the painful symptoms of TMD (Cauas et al 2004). This intervale of age may be associated a more stressful life events as work, marriage and money problems (Speculand et al 1984). However, others studies demonstrate a higher prevalence of TMD with increased age suggesting a higher trend to TMD as result of general and oral health impairment (i.e. tooth loss, inadequate prosthodontics) and degenerative changes in TMJ(Klausner, 1994) .

In this study TMJDs were more common among females than males, this observation is consistent with previous studies (Poveda-Roda et al 2009; Poveda-Roda et al 2012), and the uneven valence of TMJ disease between the two genders is not currently understood. Three main theories have been suggested implicating the hormonal factor, pain signal process and need for seeking medical care (Johansson et al 2003).

On contrary, Ogunlewe et al 2008 reported that in a total of 94 patients with TMJ disorders males constitute (58.5%) and 39 females constitute (41.5%), the male to female ratio was 1.5:1.

In this study, the most common reason for consultation was pain which is in agreement with other reports (Ogunlewe et al 2008; Poveda-Roda et al 2009). Regarding occupation of patients, majority of patients were seen among students. This result may explain the role of stress and anxiety in the etiology of TMJDs among students especially during school exam.

In this study, the most common sign and symptom of TMJDs was clicking, similar result was reported by Jagger and Wood,1992, and where as Ryalat et al (2009) demonstrated this to be the second most common symptom (Ryalat et al 2009). In this study clicking was seen in (77.83%) of patients, similarly, Ebrahemi et al 2011 reported clicking in 74.1% of their patients.

In this study TMJ pain was observed in 71.92% of all patients, this result was consistent with other study done by Bagis et al 2012, where TMJ pain was observed in 71% of their patients.

Pain during eating was observed in 53.20% of patients this result is comparable with the finding of Bagis et al 2012 (66%), on the other hand, Ryalat et al 2009, reported pain during eating in (37.4%) of their patients.

Headache is one of the major symptoms reported by individuals with TMJD (Vierola 2012). In this study about 40.39% of patients reported headache. Similarly, Bonjardim et al 2005 reported headache in 47% of their patients, while Ebrahemi et al 2011, reported headache in12.8% of their patients.

in this study, ear symptoms was observed in 39.90% of patients, Ryalat et al 2009 observed earache in 45.6% of their patients, Bagis et al 2012 ,reported ear symptoms in (87%) of their patients.

Parafunctional habits such as bruxism, clenching, and grinding are considered among the important etiological causes of TMD (Velly et al 2003). Although there are other studies found no such relationship (Pereira et al 2010). In this study parafunctional habit was observed in 70.44% of patients, similarly (Ebrahemi et al 2011) found parafunctional habits in 70.5% of their patients. Poveda Roda et al 2009 reported parafunctional habits in 63.2% of their patients.

In this study, stress was observed in 44.33% of patients. Psychological factors (i.e. anxiety and depression) can play a significant role in the aetiology and maintenance of TMD (Yap et al 2002). In fact, biopsychosocial factors were related with the onset of symptoms, muscle tension and chronic orofacial pain (Korszun 2002). It suggests that TMD are a psycophysological manifestation of stress, because TMD patients express more frequent and more severe psychologic, somatic and behavioral stress symptoms (Korszum 1998). Emotional disturbance related with stressful life events experience (i.e. health, economic and work problems) can affect to an important group of patients suffering TMD triggering the onset of TMJ referred symptomatology (Speculand et al, 1984).

In this study abnormal occlusion was observed in 37.93% of patients, there are studies that indicate different types of malocclusions have a significant effect on TMDs (Barone et al 1997). Despite this there are other

studies demonstrated no any significant association between malocclusion and TMJs (Pereira et al 2010).

In this study, history of trauma was observed in 22.16% of patients, Similarly Ogunlewe et al 2008 reported a previous history of trauma in 19.1% of their patients.

Within the limitation of this study. TMJDs are more common among young aged patients, and females, the major reasons for seeking medical care are pain and clicking, majority of patients are student, explaining the role of stress among students in the occurrence of TMJDs especially during stressful situations such as school exam, the most common reported sign of TMJDs is clicking, parafunctional habits, stress and abnormal occlusion are the most common etiology for TMJDs, the different parafunctional habits such as (unilateral chewing, gum chewing, lip or cheek biting, nail objects, clenching and teeth grinding) are relatively common among studied population, so etiology of TMJDs are mulifactorial, its treatment needs multidisplinary approach including dentist, ENT, orthopedic, physiotherapist and even some times psychiatrist, therefore treatment should be tailored for each patients accordingly. As well as cognitive-behaiour therapy and stress management interventions suggested to be beneficial in reducing the sign and symptoms of TMJDs.

References:

Bagis B, Ayaz EA, Turgut S, Durkan R, Özcan M. Ender difference in prevalence of signs and symptoms of temporomandibular joint disorders: a retrospective study on 243 consecutive patients. Int J Med Sci. 2012; 9(7):539-44. Epub 2012 Aug 30.

Barone A, Sbordone L, Ramaglia L. Craniomandibular disorders and orthodontic treatment need in children. J Oral Rehabil. 1997; 24:2-7.

Bonjardim LR, Gavião MB, Pereira LJ, Castelo PM, Garcia RC. Signs and symptoms of temporomandibular disorders in adolescents. 2005 Apr-Jun; 19(2):93-8. Epub 2005 Sep 8.

Cauas M, Alves IF, Tenório K, HC Filho JB, Guerra CMF. Incidences of parafunctional habits and posture in with patient's craniomandibular dysfunction. Rev Cir Traumatol Buco-maxilo-fac .2004; 4(2):117-24.

Cooper BC, Kleinberg I. Examination of a large patient population for the presence of symptoms and signs of temporomandibular disorders. Cranio. 2007; 25:114-126.

Dao TT, LeResche L. Gender differences in pain. J Orofac Pain. 2000; 14:169-184.

Ebrahimi M, Dashti H, Mehrabkhani M, Arghavani M, Daneshvar-Mozafari A. Temporomandibular Disorders and Related Factors in a Group of Iranian

Adolescents: A Cross-sectional Survey. J Dent Res Dent Clin Dent Prospects. 2011 Fall; 5(4):123-7. Epub 2011 Dec 19.
Egermark I, Carlsson GE, Magnusson T. A 20-year longitudinal study of subjective symptoms of temporomamdibular disorders from childhood to adulthood. Acta Odontol Scand. 2001 Feb; 59(1):40-8.
Gremillion HA. The prevalence and etiology of temporomandibular disorders and orofacial pain. Tex Dent J. 2000; 117(7):30-9.
Jagger RG, Wood C. Signs and symptoms of temporomamdibular joint dysfunction in a Saudi Arabian population. J Oral Rehabil. 1992; 19(4):353-359.
Johansson A, Unell L, Carlsson GE, Soderfeld B, Halling A. Gender difference in symptoms related to temporomamdibular disorders in a population of 50-yearold subjects. J Orofac Pain. 2003 winter; 17(1):29–35.
Klausner JJ. Epidemiology of chronic facial pain: diagnostic usefulness in patient care. JADA .1994; 125:1604-11.
Koh H, Robinson PG. Occlusal adjustment for treating and preventing temporomandibular joint disorders. J Oral Rehabil .2004; 31:287-92.
Korszum A, Papadopoulos E, Demitrack M, Engleberg E, Crofford L. The relationship between temporomandibular disorders and stress-associated syndromes. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 1998; 86:416-20.
Korszun A. Facial pain, depression and stress-connections and directions. J Oral Pathol Med. 2002; 31:615-9.
Magnusson T, Egermark I, Carlsson GE. A longitudinal epidemiologic study of signs and symptoms of temporomandibular disorders from 15 to 35 years of age.J Orofac Pain .2000; 14:310-9.
Ogunlewe MO, Agbelusi GA, Gbotolorun OM, James O. A review of temporomandibular joint disorders (TMD's) presenting at the Lagos University Teaching Hospital. Nig Q J Hosp Med. 2008; 18: 57-60.
Pereira LJ, Pereira-Cenci T, Del Bel Cury AA, Pereira SM, Pereira AC, Ambosano GM, et al. Risk indicators of temporomandibular disorder incidences in early adolescence. Pediatr Dent. 2010; 32:324-8.
Poveda Roda R, Bagan JV, Diaz Fernandez JM, Hernandez Bazan S, Jimenez Soriano Y. Review of temporomandibular joint pathology. Part I: classification, epidemiology and risk factors. Med Oral Patol Oral Cir Bucal. 2007; 12:E292-8.
Poveda-Roda R, Bagán JV, Jiménez-Soriano Y, Fons-Font A. Retrospective study of a series of 850 patients with temporomandibular dysfunction (TMD). Clinical and radiological findings. Med Oral Patol Oral Cir Bucal. 2009 Dec 1; 14 (12):e628-34.

Poveda-Roda R, Bagan JV, Sanchis JM, Carbonell E. Temporomandibular disorders. A case-control study. Med Oral Patol Oral Cir Bucal 2012. Sep; 17(5):e794–800.

Ramirez LM, LE Ballesteros, GP Sandoval, Tensor tympani muscle: strange chewing muscle. Med Oral Patol Oral Cir Bucal. 2007; 12: E96–100

Ryalat S, Baqain ZH, Amin WM, Sawair F, Samara O, Badran DH. Prevalence of temporomandibular joint disorders among students of the University of jordan. J Clin Med Res. 2009 Aug; 1(3):158-64.

Shintaku W, Enciso R, Broussard J, Clark GT. Diagnostic imaging for chronic orofacial pain, maxillofacial osseous and soft tissue pathology and temporomandibular disorders. J Calif Dent Assoc. 2006; 34(8):633-44.

Sonmez H, Sari S, Oksak Oray G, Camdeviren H. Prevalence of temporomandibular dysfunction in Turkish children with mixed and permanent dentition. J Oral Rehabil. 2001; 28:280-5.

Speculand B, Hughes A, Goss A. Role of recent stressfull life events experience in the onset of temporomandibular joint disfunction pain. Community Dent Oral Epidemiol .1984; 12:197-202.

Speculand B, Hughes A, Goss A. Role of recent stressfull life events experience in the onset of temporomandibular joint disfunction pain. Community Dent Oral Epidemiol.1984; 12:197-202.

Velly AM, Gornitsky M, Phlippe P. Contributing factors to chronic myofascial pain: a case-control study. Pain. 2003; 104:491-499

Vierola A, Suominen AL, Ikavalko T, Lintu N, Lindi V, Lakka HM et al. Clinical signs of temporomandibular disorders and various pain conditions among children 6 to 8 yearsof age: the PANIC study. J Orofac Pain. 2012; 26: 17-25.

Yap AUJ, Tan KBC, Chua EK, Tan HH. Depression and somatization in patients with temporomandibular disorders. J Prosthet Dent. 2002; 88:479-84.