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The Relationship between Eccentric Occlusion with Temporomandibular Disorders (TMD) and Para-functional Habits among Dentistry Students of Tabriz University of Medical Sciences in 2017

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ABSTRACT

Aim: The aim of this study is to investigate the relationship between side occlusion with temporomandibular joint problems (TMD) and parafunctional habits among Dentistry Students of Tabriz University of Medical Sciences. **Materials and Methods:** In this cross - sectional study, 98 students from the School of Dentistry of Tabriz University of Medical Sciences were randomly selected, and the occlusion was also examined. Data from the study were analyzed using descriptive statistics and chi-square test software SPSS 17. **Results:** In this study, 16.33 % of population had Group function occlusion, 13.23 % had Anterior Group function occlusion and 70.4 % had canine raise occlusion. 3.1% of people had functional Paralympic symptoms of Bruxism and 6.1 % were marked with Parafunctional clenching. The study population consisted, all patients with Group function occlusion that had para-functional habits. However, in patients with canine raised occlusion, 63.3 % para-functional habit parameters, 2 % has Bruxism and 1.5 % had clenching. **Conclusions:** a significant relationship was not observed between side occlusion with parafunctional habits and TMD problems among students of Tabriz University of Medical Sciences.

INTRODUCTION

Occlusion in Both natural teeth and made dental prosthesis to replace natural teeth is an important factor in the proper function of beauty and comfort occlusion is suggested in three forms of canine raised and group function occlusion and anterior group function. Side occlusion: the placement of the teeth in the lower jaw to the right or left lateral movements. When the lower jaw moves to one side from the central relationship or occlusion, the side that is moved toward is called worker side and the opposite side is called non-worker or balancing. Occlusion relation in worker side can be in the form of canine rise (if only the top and bottom canines are in occlusion), Group function (if the posterior teeth on the working side are in contact) or Anterior group function (if anterior teeth are in contact) [1].

TMD disorder is one of the most common disorders of maxillofacial area that is often associated with pain, temporomandibular joint dysfunction and masticatory muscles (2). The term TMD (Temporomandibular Disorder) is used to express all the disorders that are associated with the function of the masticatory system (3). Epidemiological studies have shown that symptoms of TMD can be found in all age groups. Although the prevalence of TMD in children is less and often with mild signs and symptoms, but with aging, its incidence in adolescence and young adulthood increases (4). Although etiology of TMD is still unclear, it seems that it is multifactorial. Among the causes of TMD, the following can be noted: 1) mal occlusion: Improper occlusion conditions can increase muscle activity and ultimately increase the risk of tissue damage. 2) Parafunctional actions: this malicious activity is like bruxism (Bruxism) and tooth pressure (Clenching) during sleep and the movements of tooth wear during the day, which causes structural changes in this area. 3) Trauma 4) developmental disorders: condylar agenesis,

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abnormal muscle or ligament connection 5) Stress: Stress leads to bruxism or clenching (5-7).

One of the main reasons of TMD is increase of muscle activity induced by psychological stress and muscle fatigue conducive to spasm. To date, no reports have been represented that stress is 100% the only factor for temporomandibular joint problems. Along with other factors such as stress, muscle fatigue and medication are causing the problem of TMD (8).

Chronic changes in masticatory muscle pain are more due to changes in psychological stress as a result of the parafunctional actions (9, 10).

TMD assessment based on psychological factors is considered important. However, a little assessment of TMD is based on psychological factors on the population under study. TMD symptoms include things such as occlusal wear, occlusal interferences, joint sounds, restrictions on opening mouth and jaw deviation when opening the mouth (7). Review of previous studies indicates that there are the great contradictions in the relationship between TMD and occlusal relationships and side occlusion problems.in the study done by Dr. Shojaie Pour et al.on 1066 students of 11 to 14 years old, parafunctional habits, deep bite side occlusion and precocious contacts at the balanced side had a significant relation with TMD problems (11). In another study done by Baghaie et al.on 448 6-year-old children, relative frequency of children with TMD was 44% in general, out of which 14% were suffering from temporomandibular joint problems including click, keritus, Deviation/Deflection, and 19% had muscle disorders and 10% had impaired joint disorder and masticatory muscles. The most frequent (60%) occlusion was related to the plan terminal Flush. subjects with Reverse Overjet showed statistically significant correlation with TMD. The relationship between TMD and other indexes was not detected (12)

On the other hand, Mr. Sousa et al.conducted a recent study on 100 patients, there was no relationship between side occlusion and TMD problems (4). In another study that was conducted in 2012 on 100 patients, factors such as occlusal interferences on the balancing side, the lack of posterior teeth more than 5, overjet and overbite more than 5 mm and had a significant role in the development of TMD problems (13). In another study by Dr. Taghavi et al.on 235 dentistry students, stress and oral habits, by creating parafunctional performance, had an important role in increasing prevalence of symptoms such as joint sound, joint pain and limitation in opening mouth. In this study, it is suggested that the type of occlusion is probably mentioned not as etiologic factor for early symptoms of TMD, but rather as a predisposing factor for the disease and if the capacity adjustment of masticatory system overcomes it, temporomandibular - jaw joints will be asymptomatic (14). In 2010, another study was conducted on 222 of 6 to 12-year-old children by Dr. Sahebi et al. Results of this study showed that the dysfunction of TMJ is associated with dental abnormalities (3).

In previous studies the relationship of side occlusion with TMD has not been investigated and studies mainly examined parafunctional habits with the wear of the teeth and TMD. Therefore, the aim of the present study is to evaluate side occlusion with parafunction and TMD that has been assessed systematically.

MATERIALS AND METHODS

This research has been approved by ethics committee of Tabriz University of Medical Sciences by an ethical code of 13950560.

In this cross-sectional study, 98 students from the Dentistry School of University of Medical Sciences of Tabriz were randomly selected and were examined regarding type of side occlusion. Inclusion criteria were presence of all the teeth in the mouth, having a parasitic class occlusion, normal static occlusion, aged between 20 and 35 years, earning a score less than 82 in the stress test. And Exclusion criteria were record of trauma to the jaw bone, infection and a history of hereditary diseases or acquired by the joint Tempromandibular, having all kinds of prosthetics and history of orthodontic treatment, jaw surgery, and periosteal joint, history of systemic diseases of inflammatory and autoimmune such as rheumatoid arthritis, the difference in side occlusion on left and right, stress in the participants. in order to eliminate stress factors, Stress questionnaire including questions about the factors affecting mental health such as personal factors, factors related to the university and social factors was given to the students in order to answer them with none, a little, somewhat, high and strongly high. Then, scores of zero to five were allocated to answers so that people with total scores from zero to 82 were considered not to have any mental or stress problems, and people with scores higher than 82 were excluded from the study (15).

The clinical examination included a review:

1) pain in joints with the touch and with the mild pressure of fingers in resting condition and when doing different movements of the jaw
2) pain in the masticatory muscles (lateral Trigouid, temporal and masseter): Touching the masticatory muscles is done from both sides and at the time of performance of the muscle.
3) limitation in opening, moving to either sides and front of jaw that their normal rates are normally 35-45 mm, and 8-12 mm and 8-12 mm, respectively. (Reviewed by digital caliper).
4) two kinds of mouth opening deviations (after initial deflection, at the end of opening path of mouth, jaw returns to the midline) and Deflection(constant deviation until the end of opening path of mouth).
5) a joint noise (clicks, Cryptosporidium) that was recording by touching with fingers when opening mouth and side and protrusive movements (checked by stethoscope).
6) Determining the type of side occlusion: When the lower jaw moves to one side from the central relationship or occlusion, the side that is moved toward is called worker side and the opposite side is called non-worker or balancing. Occlusion relation in worker side can be in the form of canine rise (if only the top and bottom canines are in occlusion), Group function (if the posterior teeth on the working side are in contact) or Ant.Group function (if anterior teeth are in contact)

7) Determining the presence or absence of left and right side movements in both balanced and worker side and protrusive movements (checked back early by carbon paper) (16, 17)

After completion of the examination, patients with the following features were considered to have TMD:

1) pain in the masticatory muscles alone or in combination with any of the Deflection when opening the mouth, limitation when moving jaw, especially at mouth opening, TMJ sounds, frequent dislocation.
2) joint pain during rest or in movements of jaw alone or in combination with any symptoms of Deviation when opening the mouth, jaw movement restrictions, especially side movements(5, 3, 18).

Then each of the participants were asked about the habits parafunctional bruxism and clenching as well as a history of trauma to the jaw bone, infection and a history of hereditary or acquired diseases related to temporomandibular joint. In addition, signs of wear on the teeth, which can reflect the parafunctional were also evaluated and demographic features of students were recorded in a checklist.

The data from the study was evaluated using the chi-square test and SPSS 17 software. In this study, P value less than 0.05 was considered statistically significant. Spearman correlation coefficient was used to determine the correlation between side occlusion and parafunctional habits.

RESULTS

The results of evaluating type of occlusion in both men and women groups showed that Canin Rise occlusion has the highest percentage in both groups, so that 75% of men and 56.8% of women have Canin Rise occlusion (Tables 1-3).

In this study, 98 dental students were examined that 16.33 percent had side occlusion of Group function, 13.23 percent had occlusion Anterior Group function and 70.4 percent had side occlusion of canine raise

94.9 percent of surveyed students did not have TMD and 5.1 percent had TMD (Table 4).

90.82 percent of the surveyed students have no para-functional symptoms and 9.2 percent had parafunctional symptoms.Also, 3.1 percent of people had Para functional symbols of Bruxism, 6.1% and were marked with clenching Para-functional symptoms. Meanwhile, in the studied population, two subjects had a combination of Bruxism and Clenching (Table 5).

In The chi-square test, any significant relationship was not found between the side occlusion and TMD considering the significance level of p = 0.05(Table 6).

In the study population, consisted of all patients with side occlusion of Group function did not have parafunctional habits.

In patients with Anterior Group function occlusion, 11.2 percent had no Para-functional habits, 1% had Bruxism and 1% had clenching.

in patients with side occlusion of canine raised, 63.3 percent had no Para-functional habits, 2% had Bruxism and 5.1% had clenching (Table 7).

In Chi-square test, considering a significance level of p = 0.05, a significant relationship was found between occlusion with Bruxism and Clenching parafunctional habits.

DISCUSSION

This study showed a significant relationship between side occlusion and TMJ problems and parafunctional habits.

In a study of Mr. Sousa et al.no relationship was found between side occlusion and TMD problems that are aligned with the results of the present study (4).

Table 1. Frequency of type of side occlusion in men

Type of side occlusion	Number	Percentage
Canine rise	48	75
Group function	9	14
Anterior group function	7	11
Total	64	100.0

Table 2. Frequency of type of side occlusion in women

Type of side occlusion	Number	Percentage
Canine rise	21	56.8
Group function	7	18.9
Anterior group function	9	24.3
Total	37	100.0

Table 3. Frequency of type of side occlusion in the subjects

Type of side occlusion	Frequency	percentage
Group function	16	16.4
Anterior group function	13	13.3
Canine raise	69	70.3
Total	98	100.0

Table 4. Frequency of TMD problem

	Number	Percentage
Without TMD	92	94
Joint sound	4	4
Muscle sound	1	1
With TMD		
Joint pain	1	1
Limitation in opening mouth	0	0
Total	98	100.0

Table 5. Frequency of type of parafunctional habit

	Number	Percentage
No parafunctional habit	89	90.8
With bruxism	3	3.04
With clenching	6	6.16
Total	98	100

Table 6. TMD frequency based on side occlusion type

	Type of side occlusion			Total
	Group function	Anterior group function	Canine raised	
Without TMD				
Number	16	11	66	93
Percentage	17.2	11.8	70.97	94.9
With TMD				
Number	0	2	3	5
Percentage	0	40	60	5.1

Table 7. Frequency of parafunctional habits base on side occlusion types

	Side occlusion type		
	Group function	Anterior group function	Canine raise
No parafunctional habit			
Number	16	11	62
Percentage	16.3	11.2	63.3
With bruxism			
Number	0	1	2
percentage	0	1	2
With clenching			
Number	0	1	5
Percentage	0	1	5.1

This study showed that 16.33 percent of Group function side occlusion, 13.23 percent had side occlusion of Anterior Group function and 70.4 percent had side occlusion of canine raise.

94.9 percent of surveyed students did not have a TMD and 5.1 percent had TMD, respectively.

In addition, 4 percent of people had joint sound, 2% had muscle pain and 2 percent had joint pain.

The results showed that 9.2% of these people have at least one of the oral parafunction habits. about the prevalence of parafunctional habits, the prevalence of Bruxism and clenching in this study were 3.1 % and 6.1 %, and in the study by Choi et al. (19) on 19-year-old Korean males, they were 8.4 percent and 9.9 percent. In the study of Duckro et al.(20), among 500 participants who were randomly selected, the prevalence of these two habits was approximately between 8 to 12 percent. In a study on the prevalence of clenching by Chua et al.(21), it was 28%, and in the study of Wanman (22), it was 11 percent. In studies of Cianceaglini et al. (23) In Italy in 2001, the prevalence of bruxism was reported as 31.4 percent, which is higher than the prevalence in the present study.

The frequency of symptoms of TMD, in this study, the prevalence of TMJ sounds was higher than others (4%). The subsequent Common symptom was for tenderness in the muscles of mastication (2%) and the lowest prevalence was for limitation in opening mouth (0%).

In a study by Choi et al. (19) among 19-year-old Korean men, the prevalence of temporomandibular joint sounds was 14%, and in the study of Gross et al.(24) in Kansas City, this rate was between 10 and 19 percent. In the study of Agerberg et al.(25) in Sweden, limited movement of the mandible was seen in 7% of people and TMJ sounds were reported in 39% of them. In the study of Agerberg et al. Chua et al.and Miyake et al. (26), the most common symptom of temporomandibular disorders was temporomandibular joint sound that is similar to the results of this study. In this study, the highest tenderness was in the masseter muscle and in the study of Dr. Morrant et al.(27) at Glasgow University, 18% of subjects had pain and sensitivity when touching muscle. In the study of Agerberg et al.(25), sore jaw muscles while touching was more in outer styloglossus muscle and temporal muscle (27%) and in the study of Gross et al.(24) The tenderness was related to outer styloglossus muscle for 14.7 percent. In the study of Vanderas (28) the most common symptoms of temporomandibular disorders include muscle stiffness and tenderness of the temporomandibular joint to touching that is incompatible with the findings of this research that the most common symptom was sound symptom.

The results of Henrikson et al.(2009) showed that normal occlusion less leads to the signs and symptoms of TMD (TMD) while some features of occlusion, generally found in the side occlusion of Class 2. The possibility of signs and symptoms of TMD is so much that is incompatible with the present study results for the lack of a significant relationship between occlusion and TMD disorders. This discrepancy can be because of comparing of people with normal occlusion (anteroposterior) and mal occlusion in their study and comparison of (side) normal occlusion types in our study (29).

Due to the difference in diagnostic methods and research communities, comparing the difference between this study and other studies is impossible.

CONCLUSION

Based on the results of this study:

1) the most common symptom of temporomandibular disorders among students is the sound of joint.
2) Clenching was the most prevalent Parafunction habit.
3) There was no the relationship between the eccentric occlusion and TMD problems.
4) There was no significant relationship between eccentric occlusion and TMD problems and parafunctional habits.

REFERENCES

1. Schuyler CH. Fundamental Principles in the Correction of Occlusal Disharmony, Natural and Artificial Read before the Section on Full Denture Prosthesis at the Seventy-Sixth Annual Session of the American Dental Association, St. Paul, Minn., 8, 1934. The Journal of the American Dental Association. 1935;22(7):1193-202.
2. Jenkins DN. TMD: the great controversy. Journal of the California Dental Association. 2014;42(8):518-20.
3. Sahebi M, Bostani P. Prevalence of temporomandibular disorders and its association with malocclusion in mixed dentition among patients referredto Tehran University Dental School. Journal of Dental Medicine-Tehran University of Medical Sciences. 2010;23(3):153-60.
4. Sousa ST, Mello VV, Magalhaes BG, Morais MP, Vasconcelos MM, Junior AD, et al. The role of occlusal factors on the occurrence of temporomandibular disorders. Cranio: the journal of craniomandibular practice. 2014;21(5):109.
5. Okeson J. Management of temporomandibular disorders and occlusion. 6th: St.Louis: Mosby; 2008. p. 191-226.
6. Mupparapu M. Evidence Based Approach for the Diagnosis of Temporomandibular Joint Disorders (TMD). Journal of Indian Prosthodontic Society. 2013;13(4):387-8.
7. Svensson P, Whelan L. New TMD classification - new year for JOR. Journal of oral rehabilitation. 2014;41(1):11.
8. Ash MM, Ramfjord SP. Occlusion. WB Saunders Company; 1995.214-220.
9. Schiffman EL, Fricton JR, Haley D. The relationship of occlusion, parafunctional habits and recent life events to mandibular dysfunction in a non-patient population. Journal of oral rehabilitation. 1992;1;19(3):201-23.
10. Hidaka O, Iwasaki M, Saito M, Morimoto T. Influence of clenching intensity on bite force balance, occlusal contact area, and average bite pressure. Journal of Dental Research. 1999:1;78(7):1336-44.
11. Shojaeepour R,Fayyaz H. Study of the Epidemiology of temporomandibular joint health - Mashhad jaw in adolescents 11-14 years old. Journal of Dentistry(Dandanpizishki Iran).2009;21;4(73):245-253.
12. Baghaee B, Ajami B, Hafez B, Khaleseh N. Evaluation of the Relationship between Occlusion and Temporomandibular Disorders in Six-Year-Old Preschool Children in Mashhad-Iran. J Mash Dent Sch. 2010;33(4):276.
13. Costa M, Junior GF, Santos C. Evaluation of occlusal factors in patients with temporomandibular joint disorder. Dental Press J Orthod. 2012;17(6):61-8.
14. Taghavi Zenouz A,Ghallehdar S,Vatankhah M.Determine the prevalence of signs and symptoms of temporomandibular disorders - jaw in Tabriz dental students. Mdical Journal of Tabriz University of Medical Sciences. 2003;37(59):26-29.
15. Sadeghian E, Heidarian Pour A. Stressors and mental health status among students of Hamadan University of Medical Sciences. Hayat. 2009;15(1):71-80.
16. Gouharian R, Madani AA. Evaluation of temporomandibular joint status and related signs and symptoms in students of Mashhad Dental school. 2006: 197-202.
17. Greven M. TMD, bruxism, and occlusion. American journal of orthodonticsand dentofacial orthopedics: official publication of the American Association of Orthodontists, its constituent societies, and the American Board of Orthodontics. 2011;139(4):424.
18. Jenkins D. More about TMD diagnostics. Journal of the American Dental Association. 2013;144(9):982.
19. Choi YS, Choung PH, Moon HS, Kim SG. Temporomandibular disorders in 19-year-old Korean men. Journal of oral and maxillofacial surgery. 2002;60(7):797-803.
20. Duckro PN, Tait RC, Margolis RB, Deshields TL. Prevalence of temporomandibular symptoms in a large United States metropolitan area. CRANIO®. 1990;8(2):131-8.
21. Chua EK, Tay DK, Tan BY, Yuen KW. A profile of patients with temporomandibular disorders in Singapore--a descriptive study. Annals of the Academy of Medicine, Singapore. 1989;18(6):675-80.
22. Wänman A. Craniomandibular disorders in adolescents. A longitudinal study in an urban Swedish population. Swedish dental journal. Supplement. 1986;44:1-61.
23. Ciancaglini R, Gherlone EF, Radaelli G. The relationship of bruxism with craniofacial pain and symptoms from the masticatory system in the adult population. Journal of oral rehabilitation. 2001;28(9):842-8.
24. Gross A, Gale EN. A prevalence study of the clinical signs associated with mandibular dysfunction. J Am Dent Assoc1983; 107(6):932-6.
25. Agerberg G, Carlsson GE. Symptoms of functional disturbances of the masticatory system. A comparison offrequencies in a population sample and in a group of patients. Acta Odontol Scand 1975; 33(4):183-90.
26. Miyake R, Ohkubo R, Takehara J, Morita M. Oral parafunctions and association with symptoms of temporomandibular disorders in Japanese university students. Journal of oral rehabilitation. 2004;31(6):518-23.
27. Morrant DG, Taylor GS. The prevalence of temporomandibular disorder in patients referred for orthodontic assessment. British journal of orthodontics. 1996;23(3):261-5.
28. Vanderas AP. Prevalence of craniomandibular dysfunction and adolescents: a review. Pediatric dentistry. 1987;9(4):313-319.