



Prevalence of myofacial pain dysfunction syndrome in dental students of international campus of tehran university of medical sciences

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ABSTRACT

Introduction: Among oral and maxillofacial pains, masticatory muscle pain is the second most common complaint of patients after toothache, which affects a significant proportion of people. This disorder is caused by various physiological and psychological causes, such as stress and anxiety. In the meantime, the stressful carriers such as dentistry are exposed to the side effects of these pressures more than other groups in the society due to the pressure and stress which exist invariably and naturally in these jobs. The purpose of this study is to assess the prevalence of myofacial pain dysfunction syndrome (MPDS) in dental students and also study the relationship of the disease with mental-psychological disorders such as stress, anxiety and other effective factors.

Materials and Methods: This descriptive-cross sectional study, was conducted on students in Tehran International College of Dentistry, between years third to sixth, whom were selected randomly. For each student an information questionnaire consisted of two Background and Clinical examination parts, was filled out and analyzed regarding clinical examinations and the presence or absence of pain syndrome caused by the mastication muscles dysfunction. Subsequently, the data and information related to the variables were analyzed, using SPSS 20 statistical software and descriptive statistical tests and Fisher's exact test.

Results: In this study 48 students were examined. The most common symptoms were Clenching with the prevalence of 79.2%, and then was the joint sound of "click" type with a prevalence of 77.1%. Furthermore there was a significant relationship between depression and anxiety and masticatory muscle pain level. In the group of patients who were suffering from depression and anxiety, 66.7% of subjects felt pain in masticatory muscles, while in the non-depressed group, the rate was 23.8 percent. According to this finding, difference in pain between the two groups would be significant ($p=0.004$). This suggests that depression can be effective on muscle pain rate. Based on the results of this study, the incidence of myofacial pain dysfunction syndrome in women, is 55.3%, while the rate for men is 20%, which demonstrates that myofacial pain dysfunction in women is more frequent than men.

Conclusion: Considering the high prevalence of myofacial pain dysfunction syndrome among dental students and its relationship with depression and anxiety, it could be recommended to students to perform further checkups and prevent from joint and muscle pain problems in case of feeling the symptoms.

Keywords: Masticatory muscle pain, Depression, Anxiety, Bruxism, Parafunctional habits.

Introduction

Myofacial pain dysfunction syndrome (MPDS), is characterized by dull pain, which appears to be acute, during mandible activity. This disorder

is the second most prevalent chronic disease of the oral and maxillofacial region, after toothache, which affects a significant part of the population [1].

It has been estimated that 44 million people, are suffering from masticatory muscle pain disorder in United States [2]. Furthermore, researches suggests that between 50-75% of individuals in all age groups, have signs of facial muscle pain that among them about 20-25%, of people suffering from the symptoms of this disease, do not seek treatment, although women are much more likely to treat this disease [3-4]. The average incidence of the disease among middle-aged adults (30-60 years), has been reported 37% in men and 65% in women [5], and among elderly (65 years), it has been reported 85% [6].

Dysfunction of the masticatory muscles, appears with the 5 symptoms, including limitations on oral opening, or restrictions on the movement of the jaw, temporomandibular joints pain, tenderness in one or more masticatory muscles, or tendons attached to it, joint sound, and headache [7]. Several reasons are mentioned for this disease, such as trauma, weather conditions, muscle weakness, muscle ischemia and mental disorders [8]. Some researchers have named the patient's psychological structure, as a predisposing factor for this syndrome, and have considered stress as a significant factor in the occurrence of teeth Clenching and Grinding habits, which leads to spasms and pain in mastication muscles.

Occlusion imbalances are the accelerator factor in the pathogenesis of (MPDS), and can predispose patients to an increased parafunctional activity. To reduce (MPDS) symptoms, patient's physical and psychological therapy is necessary [9]. Muscle pains would be caused when muscles are extremely tired and tend to spasm, but it is impossible for the jaw muscles during eating and normal chewing, to be used so. To cause muscle pain, the patient' teeth must undergo Clenching and grinding for several hours during a day, which would probably arise as a response to stress [10].

The stressful jobs due to their difficulty and stress are myofacial pain dysfunction syndrome subjected to the effects of these pressures more than any other group in the community. This syndrome has a salient prevalence in tense and stressful jobs. In most papers, it has been noted that this syndrome has got a psychological disorder background, and to treat it, before any drug therapy, the patient initially should be referred to a psychiatrist [11], by removal and control of stress, one could see the reduction in the incidence of (MPDS) in the community, especially in dentistry students group, which are typical of people whom are under stress. Therefore, in this study we decided to

study the prevalence of MPDS in Tehran International dentistry students, and evaluated the association of the disease with mental and psychological disorders such as, stress and anxiety.

Materials and Methods

This study was a descriptive, cross-sectional study and targets third to sixth year dentistry students in the College of Dentistry at Tehran University of Medical Sciences international campus. Samples of 48 patients were randomly examined in a cross-sectional manner, during two semesters. Before any examination, the process was explained to the students; and then they were examined after filling out the democratic questionnaires and consent in order to assess the presence or absence of pain syndrome resulting from dysfunction of the masticatory muscles.

Then, the data and information related to variables such as occlusal interactions, maximum mouth opening, joint tenderness to touch, mouth deviations as the mouth opening, masticatory muscle stiffness, parafunctional habits, mental and psychological disorders, and Incisal relationships, were analyzed by studying the frequency distribution table. The method to measure the degree of mouth opening was done by measuring the distance between two incisal edges of maxilla and mandible with an ordinary ruler. The degree of jaw deviation in lateral movements also was measured with the amount of mandible midline movement than the maxilla with an ordinary ruler. Joints sounds were evaluated by hand fingers. Finally, changes in these parameters such as pain and tenderness of the muscles and the degree of mouth opening were analyzed by SPSS software and descriptive statistical tests and Fisher's exact test.

Results

Table 1 shows the frequency distribution of variables associated with masticatory muscle painful dysfunction syndrome and Table 2 shows frequency distribution of demographic information associated with masticatory muscle painful dysfunction syndrome.

In this study, 48 students from the International College of Dentistry at Tehran University of Medical Sciences international campus, were studied, including 38 females (79.2%) and 10 males (20.8%, respectively). 43 subjects (89.6%) were single, and 5 subjects (10.4%) were married. They were aged from 21 to 34 years old with a mean age of 24.04 and Standard deviation of 1.97. Of the participants, 34 subjects (70.8%) had no

history of trauma, but 14 subjects (29.2%) expressed the trauma background. Among the participants, 29 subjects (60.4%) did not express any history of Internal diseases, but 19 subjects (39.6%) had a history of these disease. 21 subjects (43.8%) had no depression and anxiety background, but 27 of them (56.3%) mentioned this background.

Among the participants, 32 subjects (66.7) did not use any medication versus 16 patients (33.3%) had a history of drug use. Among the participants, 15 subjects (31.3%) had no background of surgery, while 33 subjects (68.8%) expressed surgery and hospitalization background. Those mentioned Bruxism, Clenching, lip, cheek and gum chewing background in their history, were 9 (18.8%), 38 (2.79) and 24 subjects (50%) respectively; and in contrast, 39 (3.81%), 10 (8.20%) and 24 subjects (500%), respectively, had no evidence of Bruxism, Clenching and lip, cheek and gum chewing. 43 subjects (89.6%) had not mentioned a history of occlusal and between dental Interferences, but 5 subjects (10.4%) had a background of occlusal interferences, that among them 35 subjects (72.9%) had no deviation versus 13 patients with deviation (27.1%).

Maximum mouth opening range was 60 mm and the minimum was 25 mm that the \pm mean SD of mouth opening was 42.27 ± 6.92 . 30 subjects (62.5%) of the participants were without muscle tenderness against the 18 patients (37.5%) with muscle Tenderness and also 25 subjects (52.1%), had no pain of masticatory muscles versus 23 patients (49.9%) with a background of pain, 38 subjects (79.2%) had a background of muscle fatigue, but 10 subjects (20.8%) had no muscle fatigue. Only 2 subjects (2.4%) had a background of trismus that versus 46 subjects (8.95%), was allocated to a small number. 11 subjects (22.9%) had no Click sound whereas 37 subjects (77.1%) had a click complication, 45 subjects (93.8%) had no popping but 3 subjects (6.3%) had popping.

4 people (8.3%) had temporalis pain, 13 subjects (27.1%) pain in the masseter, 7 people (14.6%) in the internal pterygoid, 8 subjects (16.7%) had pain in the external pterygoid, 8 subjects (16.7%), pain during opening mouth, 1 subject (2.1%) had pain in the left lateral movements of the mandible. Among the participants, 7 subjects (14.6%) had Overjet, 10 subjects (20.8%) had overbite, 22 subjects (45.8%) had myositis. The maximum number of teeth was 32 and the minimum was 24 with an average and SD of 29.15 and 2.6, respectively. The maximum movement of the lower jaw (mandible) to the right 11 mm and the minimum

movement was measured 2 mm.

	Variable	Number	Percentage
Masticatory muscle pain	Masseter muscle	13	27.08
	The temporalis muscle	4	8.33
	external pterygoid muscle	8	16.7
	Internal pterygoid muscle	7	14.58
Habits or parafunctions	Bruxism	9	18.8
	Chewing Gum	24	50
	Clenching	38	79.2
Previous records	Trauma	14	29.2
	Internal diseases	19	39.6
	Depression and anxiety	27	56.3
	Drug use background	16	33.3
	Background of surgery	33	68.8
	Background of Trismus	2	4.2
	Background of clicksound	37	77.1
	POPPING background	3	6.3
	Dental interactions background	5	10.4
	Deviation of the jaw background	13	27.1
	Tenderness background	18	37.5
	Frequency distribution based pain	Pain during mouth opening	8
Pain during movement of the mandible to the left		1	2.1
		1	2.1
Muscle pain		22	45.8
Malocclusion status	Overbite	7	14.6
	Overjet	10	20.8
Fatigue frequency distribution	Fatigue	10	20.8

Table 1. Distribution of variables associated with Myofacial pain dysfunction syndrome.

	Variable	Number	Percentage
Gender	Female	38	79.2
	Male	10	20.8
Marriage background	Married	5	10.4
	Single	43	89.6

Table 2. Frequency distribution of demographic information associated with myofacial pain dysfunction syndrome.

Discussion

All participants in this study were 48 people, among which 79.2% were female and 20.8% were male. The mean age in this study was 24.04 1.97. The results showed that the most involved muscles in the masticatory muscle painful dysfunction syndrome are masseter muscles, external and internal pterygoid muscles and the temporalis muscle. But the most prevalent symptom in this study was Clenching with a prevalence of 79.2%, and then joint sound of “click “type,

with a prevalence of 77.1%. Severe limitation of mouth opening (upper and lower incisor teeth incisal edges distance of less than 30 mm) in 6.2% of people, mild restriction (between 30 to 39 mm) observed in 18.75%, also 75.05% of the people also had a mouth opening at 40 mm and above, that was normal.

According to the findings of this study, masticatory muscle painful dysfunction syndrome prevalence in women was 55.3% percent, while the rate for men is 20%, which indicates that the degree of masticatory

muscle painful dysfunction, in women is more than in men.

In the case of depression effect on the pain felt in the mastication muscles, the results of this study showed that 66.7% of the people who are suffering from depression and anxiety, feel pain in the masticatory muscles, while in the non-depressed group the rate was 23.8%, and the pain difference between the two groups of depressed and non-depressed people was significant ($p=0.004$). It shows that depression is effective on pain. Depression, more than normal level, in patients with Myofacial Pain-Dysfunction Syndrome, suggests that this group of patients, have psychological characteristics, different from normal people, and this physical illness may be caused by mental-psychological distress, in them. Among psychological factors of TMD, depression is the most common cause, which in various studies, the relationship between high prevalence of TMD and depression has been shown. People suffer from this syndrome have a reduced ability in dealing with themselves life's everyday problems and the mental-psychological stimulant factors, result in anger and as a result severe and prolonged muscle contractions, that these prolonged contractions lead further increase in their masticatory muscle pain and discomfort [12-13]. On the other hand, the amount of muscle fatigue, in the group whom suffer from depression and anxiety, was 25%, but it was 14% in the group with no depression or anxiety.

However, the differences rate was not statistically significant. High incidence of myofacial pain dysfunction syndrome, in jobs such as dentistry, which is associated with stress and anxiety is more than other people in the community, and presence of these disorders in these people, causes disability and anxiety, and decreases one's job performance. The evidences suggest that higher levels of stress (mental pressures) could increase the parafunctional habits, such as pressing or grinding teeth together. The cause for these stresses is different. It would be a short-term physiological phenomenon, such as exam or close family death, which takes a short period of time, or could be mental-psychological disorders, such as depression and anxiety, which in the long time troubles the person, thus increase the parafunctional habits [14].

In the Auerbach study, in 2001, which aimed to investigate the role of psychological factors in the development of muscle pain in patients with TMD, 258 patients participated. The findings of this study showed a direct correlation between emotional dysfunction and

TMD, and also in this study, it was found, that the psychological factors played a prominent role in the originating of muscular pain in the jaw, which, with behavioral interventions in patients with TMD, one could reduce the symptoms [12]. Also, in this regard, Manfredini et al study's aim in 2004, was to examine the relationship between temperament and agoraphobia, in different groups of patients with TMD, using psychological methods. Totally, 131 patients were enrolled in the study, and the signs and symptoms of TMD, using a standardized clinical examination, were studied.

In order to assess temperament, and agoraphobia, two self-report questionnaires were used. The results showed that there is a significantly higher prevalence of mood (temperament) disorders ($P<0.001$), and agoraphobia ($P<0.01$), in patients with TMD, rather than other healthy groups [13]. In a similar study, Yap et al, in 2002, showed that the rate of depression in the group with jaw pain is more often than other groups [15]. Honarmand and colleagues, in 2009, investigated the prevalence of psychiatric disorders in patients with pain syndrome, caused by a dysfunction of the masticatory muscles. The results of this study showed that a significant percentage of patients suffer from anxiety and depression disorders. However, some patients had several psychiatric disorders together [16]. As noted, several studies show that the rate of depression and other mental-psychological disorders, in patients who suffer from myofacial pain dysfunction, is more, compared to healthy people, that the results are consistent with the results of this study.

The results of the present study showed that the most involved muscle in myofacial pain dysfunction of masticatory muscles, was the Masseter muscle (27.08%), External pterygoid muscle (16.7%), Internal pterygoid muscle (14.58%) and the temporalis muscle (8.33%), respectively. But the most prevalent symptom, in this study, was clenching with prevalence of 79.2%, and then was joint sound, of "click" type, with a level of 77.1%. According to the results of Mortazavi et al, the most affected muscle, was the internal pterygoid muscle, and the least, was the temporal muscle [17], which was consistent with our results. But In Darbandi study, the most involved muscle was mentioned the external pterygoid muscle [18]. The temporomandibular joint sound in Mortazavi study was reported in 74.4% of the patients [17], which these results was reported to 73.08% by Darbandi [18], the findings was consistent with the results of the present study. The mean age in this study, was 24.04 ± 1.97 , that this rate, in the studies

by Honarmand, Mdani, De Boever and Altinday, was reported 32.4, 26.67, 33.5 and 31.1, respectively [19-22]. Meanwhile, the most common age for incidence of this syndrome, based on the results by this study and studies by researchers like Lipton and Glass, has been between 20 and 40 years [23-24].

Based on the Helkimo index, severe limitation, was seen in mouth opening (upper and lower incisors', incisal edges distance of less than 30 mm) in 6.2% of subjects, mild restriction (between 30 to 39 mm) in 18.75%, also 75.05%, of the patients had mouth opening, to 40 mm and more, which was normal. In Mortazavi et al's study, limited mouth opening, ranging from mild to severe, observed in 71.8% of individuals [17], which is this amount was reported 26% by Madani [20]. Limited mouth opening, ranging from mild to severe, in the present study, the 95/24 percent was observed, which was similar to the study of civic and colleagues [20]. Also in this study, 29.9% of people had a history of trauma, but the trauma, had no significant effect on any of the measured parameters, including muscle pain, jaw locking and muscle fatigue that the case was inconsistent with Kamisaka study [25]. Kamisaka study, mentioned that there is a relationship between the damage to the jaw area and temporomandibular disorders. Locking jaws background, in this study, was in 4.2% of cases, whereas in Mortazavi, it has been reported in 7.7% of the cases [17]. About malocclusion, the present study showed that the Overjet level, was 14.6% and the Orbit level was 20.8% of the cases.

Bruxism and Clenching rate, in this study, was 18.8% and 79.2%, respectively. Prolonged contraction of muscles during Bruxism and Clenching, prevent proper blood supply to the muscle tissue, which reduces the oxygen supply to the muscles, and carbon dioxide and other metabolites that cause pain, accumulation in this region and cause pain and fatigue [14]. However, in this study, no significant relationship was found between Bruxism and Clenching, and fatigue amount. Shirani et al, in 2008, studied the prevalence of parafunctional habits, according to oral-temporal-mandibular symptoms in Patients of clinics in Isfahan. The results showed, the prevalence of Bruxism and Clenching were 14.6% and 29.3%, respectively. 16.8% of women and 12.2% of men suffered Bruxism.

Clenching prevalence was not significantly different in two genders. In patients with Bruxism, tooth abrasion with 55%, masticatory muscle pain with 53%, were the most common symptoms; and in patients with Clenching, tooth abrasion with 42% and temporoman-

dibular joint sounds or "click" with a 37.5%, had the prevalence [26]. As it was mentioned, Bruxism and Clenching prevalence in the present study, was 18.8% and 27.9%, respectively, which was very different from Shirani and colleagues, study. There was no relationship between these two factors (Clenching and Bruxism) and gender; also in both studies in patients suffer from Clenching, temporomandibular joint sound or "click", with 76%, had the most prevalence. The highest prevalence was 76%. Masticatory muscle pain with 50%, was in the next category that was consistent with Shirani et al study, also muscle tenderness with 39%, masticatory muscle fatigue with 23%, and background of locking the jaw, with 5%, were in next levels. Masseter masticatory muscle pain, with 25%, and temporalis muscle pain by 10%, had the highest and lowest pain level.

Akhter and colleagues study's aim, in 2011, was to investigate the prevalence of temporomandibular disorders among university students, in Japan, over a period of 3 years. Study population initially consisted of 2374 undergraduate students, among which, after three years, 492 students using a questionnaire and TMD symptoms and experience of jaw injury, stress, orthodontic treatment and parafunctional habits were selected and studied. The results of this study showed that in men who have experienced jaw injury, the risk of masticatory muscle pain, 3.54 times higher than those who had no such background. The study also revealed that, in women who have experienced stress and Bruxism are respectively, 10.56 and 5 times more, at the risk of muscle pain, than women who have never experienced stress or Bruxism. The overall results of this study indicated that the experience of jaw injury, stress and teeth grinding, is significantly associated with increased risk of masticatory muscle pain [27].

This study, like the present study, had used university students as the study population, to investigate masticatory muscle pain disorder. One advantage of this study compared to our study, was to use a large statistical population, which increases the study potency. However, this study, as in our study, found stress and other psychological disorders, effective on causing pain in masticatory muscles. However, about the effects of trauma on masticatory muscle pain, results of two studies was inconsistent, in a way that, in this study, men who had experienced a jaw injury, were at a higher risk of masticatory muscle pain, but our study, we found no association between a background of trauma and pain in the masticatory muscles. The purpose of Marklund

study, in 2008, was to investigate the prevalence of pain in the masticatory muscles, in a period of one year, on the dentistry students. Also the other purpose of this study was to analyze that, whether gender, dental malocclusion and parafunctions, are effective on signs and symptoms of jaw muscles pain, or not.

The study population was 308 student newcomer to the University, whom were studied at the beginning and after one year. History and personal information was collected using a questionnaire. Examinations in this study included, palpation of masticatory muscles, the Maximum pressing of teeth together test, mandibular movement to left and right measurement test, and classifying the types of Occlusion. The result of this study showed that myofacial pain dysfunction syndrome during 1 year was 19%. Pain incidence due to RDC/TMD factors was 4%. This study like the present study, showed that the incidence of pain in the female students' masticatory muscles, was almost 4 times than the male students [28].

Conclusions

The frequency of myofacial pain dysfunction syndrome among dentistry students is relatively high and disorders like Clenching and click, are prevalent than other factors. Between males and females in terms of myofacial pain dysfunction syndrome, there was difference and it was determined that stress, anxiety and other psychological disorders, are effective on this syndrome. Also, due to the high prevalence of Clenching and click and also depression and anxiety (without MPDS) in dentistry students; and by justification that these are predisposing factors for this syndrome, the students could advise that if there was any of these symptom, should attempt for more investigation and prevent further joint problems and muscle pains, which causes more depression and decreased quality of life.

Conflict of Interest

There is no conflict of interest to declare.

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