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Evaluation of the Prevalence of Temporomandibular Joint Disorder Syndrome in Dental School Students with Psychometric Analysis*

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Abstract: Aim: Despite the increasing volume of evidence implicating psychological factors in patients with temporomandibular joint (TMJ) disorder syndrome, these aspects of management are frequently neglected. In the diagnosis and treatment of this syndrome, clinical examination must be accompanied by an evaluation of the patients' emotional condition. In our study, the prevalence of TMJ disorders of dental students and the relation between TMJ disorder syndrome and the emotional condition of the patient were evaluated.

Methods: The study group consisted of 156 males and 105 females: a total of 261 students. For the psychometric analysis the Minnesota Multiphasic Personality Inventory (MMPI), Symptom Checklist 90-Revised (SCL 90-R), Beck Depression Scale (BDS), Rosenberg Self-Esteem Scale (RSS), and State Trait Anxiety Inventory I and II (STAI-I and II) tests were used. Standard clinical examination

protocol was followed.

Results: Psychometric measurements revealed significant psychological differences between subjects with the following TMJ disorder syndrome symptoms: hypochondria, hysteria (MMPI), somatization, and anger (SCL 90-R). In both groups, there were no significant differences between the scales of BDS, RSS and STAI-I and II. Clinical examination revealed internal derangement of 18 male and 18 female students and external derangement of 6 male and 1 female students.

Conclusion: In terms of the relation to TMJ disorder syndrome, where it affects the patient's emotional condition, psychiatric support can be very useful in the evaluation and treatment of patients with these complaints.

Key Words: MPDS, TMJ disorder syndrome, emotional conditions

Introduction

The concept of a single temporomandibular joint disorder syndrome (TMJDS) has been replaced with the concept of a series of diagnostic categories such as myofascial pain and dysfunctions, internal derangements, arthritic disorders, and muscle hyperactivity disorders. Although many pain syndromes affect the face, head, and neck region, the more prevalent conditions include temporomandibular joint disorders and atypical facial pain (1,2). Previously, the myofascial pain-dysfunction syndrome (MPDS) included all TMJ/masticatory muscle pain, jaw dysfunction and joint clicking (3). Recent studies have reported that segregated MPDS and TMJDS are divided into two subgroups: myogenic facial pain and TMJ derangements (4).

Scientific investigation of TMJDS began in the 1950s. Early studies suggested that the occlusal condition could

influence masticator muscle function. Occlusion and later emotional stress were considered the major etiologic factors of functional disorders of the masticatory system through the 1960s and into the 1970s (5).

It is commonly accepted that TMJ derangement is of multifactorial origin and is best thought of as the result of a combination of occlusal, neurophysiologic, and psychological factors (6). It is concluded that the subcategorization of myofascial pain-dysfunction patients into a myogenic pain group and a TMJ internal derangement group is justified on the basis of psychometric differences (7).

This study was carried out to determine the relation between the emotional condition of the students at a Faculty of Dentistry and their TMJ disorder syndrome complaints. To this end, students' characteristic peculiarities, and the level of psychiatric symptomology

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such as anxiety and depression were evaluated through the help of psychometric scales. The results of psychometric tests and the results of clinical examination were then statistically analyzed for any significant relationship between the emotional condition and TMJ disorders. The importance of evaluating the patient's emotional condition in the treatment of TMJDS needs to be considered.

Materials and Methods

The research involved 105 females and 156 males. The subjects were between 19 and 23 years old and the average age was 21.8. For psychometric analysis the Minnesota Multiphasic Personality Inventory (MMPI), Symptom Checklist 90-Revised (SCL 90-R), Beck Depression Scale (BDS), Rosenberg Self-Esteem Scale (RSS), and State Trait Anxiety Inventory I and II (STAI-I and II) tests were used. A standard clinical examination protocol was performed by one of the researchers (Table 1).

Table 1. Standard clinical examination protocol.

SELCUK UNIVERSITY FACULTY OF DENTISTRY Craniomandibular Disorders Examination Form					
A- SUBJECTIVE FINDINGS					
* Headache					<input type="checkbox"/>
* Face Pain					<input type="checkbox"/>
* Ear Pain					<input type="checkbox"/>
* Neck Pain					<input type="checkbox"/>
* Clicking from Joints					<input type="checkbox"/>
* Pain While Mouth Opening or Closing					<input type="checkbox"/>
* Muscle Fatigue					<input type="checkbox"/>
* Locking Adhesion					<input type="checkbox"/>
B- CLINICAL FINDINGS					
* Limitation of Mouth Opening					<input type="checkbox"/>
* Deviation	Right	<input type="checkbox"/>	Left	<input type="checkbox"/>	
* Deflection	Right	<input type="checkbox"/>	Left	<input type="checkbox"/>	
* Oscultation of TMJ					
		Right		Left	
Clicking Early		<input type="checkbox"/>		<input type="checkbox"/>	
Middle		<input type="checkbox"/>		<input type="checkbox"/>	
Late		<input type="checkbox"/>		<input type="checkbox"/>	
Reciprocal		<input type="checkbox"/>		<input type="checkbox"/>	
Crepitation		<input type="checkbox"/>		<input type="checkbox"/>	
Popping		<input type="checkbox"/>		<input type="checkbox"/>	
C- DIAGNOSIS					
Intracapsular	<input type="checkbox"/>				
Extracapsular	<input type="checkbox"/>				
Normal	<input type="checkbox"/>				

MMPI: It gives information about psychiatric syndromes, emotional decisiveness, neurotic inclinations, self realization, family and social affairs, social norms and anti-social inclinations, relative to a norm, of people with psychiatric disorders (7).

SCL 90-R: It consists of the materials used to measure somatization, obsession, compulsion, depression, anxiety, sensitiveness and hostility toward others, phobic and paranoid thinking, and psychotism (8).

BDS: It measures signs and symptoms of depression (9).

STAI I-II: This 2 x 20 item inventory gives scores that index the current anxiety level of the subject ('state') and degree to which he or she is prone to experience anxiety ('trait') (10).

RSS: It is used to evaluate the self respect of the person (11).

Student's t test was used to compare groups for any significant difference (Table 2).

Results

Of the 261 students examined and tested psychometrically, 36 (13.79%) had internal and 7 (2.68%) had external disorders. A large proportion of the students (83%) had no symptoms. Eighteen of the students with internal disorders were women and the other 18 were men. Six of the students with external disorders were male and one was female. Consequently, the prevalence of TMJ disorder syndrome was about 17% and there was a significant relation between the characteristic peculiarities of the subjects and TMJ.

Table 2. Gender profile of students with TMJ disorders.

	TMJ Disorders					
	Internal Disorders		External Disorders		Normal	
	N	Rate	N	Rate	N	Rate
Female	18	6.93%	1	0.38%	86	32.95%
Male	18	6.93%	6	2.29%	132	50.57%
Total	36	13.79%	7	2.68%	218	83.52%

The mean scores on the MMPI test and the results of the t test are presented in Table 3. TMD patients scored significantly ($P < 0.05$) higher on hypochondriasis and hysteria when compared with the controls.

The mean scores on the SCL 90-R test and the results of the t test are presented in Table 4. TMD patients scored significantly ($P < 0.05$) higher on somatization, hostility and on the global severity index when compared with the controls.

In the other psychometric tests (BDS, RSS, STAI I and II), no significant relationship was found between the students with TMJ disorders and normal students.

Discussion

People may have some complaints about their orofacial region due to emotional stresses. This is closely related to the emotional condition of the individual.

Complaints of pain are often related with depression. However, in the event of pain with depressive symptoms, somatized pain has been found to be underlying the depression (12). The relation between pain and depression may be examined in three aspects: suggestion of pain as a symptom of depression, the fall in the pain threshold in depression, and the conjunction of depression with chronic pain. Therefore, the interest of clinicians in the evaluation of the patients with chronic

pain has greatly increased (13). In the present study, the relation between complaints of TMJ pain and depression, anxiety, self-respect and life-satisfaction were not statistically significant.

The treatment of TMJDS patients is still an unsettled subject to be handled with multi-disciplinary approaches. Although some studies have found a relationship between TMJDS and emotional well-being (14,15), there are also some opposite views (16,17). However, we know that pain related to personality characteristics is much more common in underdeveloped countries (18).

In some studies (19,20) carried out in dental schools, only psychometric tests were used. However, in our study, clinical examination was also performed with these tests. Therefore, we were able to evaluate the clinical diagnosis and the emotional status simultaneously.

Although the etiology is not proven, Harris (21) and Fine (22) have reported a relationship between anxiety and TMJDS. Presently, there are three hypotheses concerning the relation between anxiety, muscular tension and TMJDS pain: emotional states such as anxiety elicit muscular tension, the persistent muscular tension results in pain, and this sequence of events leads to TMJDS symptoms. A number of studies (23,24) indicate that 50-75% of TMJDS patients experience stressful life events prior to the onset of their symptoms. They reported work problems, family conflicts, responsibility

	TMD n = 43		Normal n = 218		t	P
	Mean	SD	Mean	SD		
Lying	4.76	2.22	4.69	2.45	0.21	0.83
Extra-Ordinary	10.12	6.15	11.42	6.77	1.48	0.14
Defensivity	11.68	3.96	11.48	4.07	0.37	0.71
Hypochondriasis	9.765	5.253	11.80	5.105	2.98	0.00*
Depression	22.502	5.501	23.482	4.929	1.44	0.15
Hysteria	22.028	5.430	24.00	6.231	2.49	0.01*
Psychopathic Deviate	18.52	5.355	19.164	5.101	0.94	0.34
Masculinity-Femininity	27.005	5.046	26.211	5.775	1.08	0.28
Paranoia	13.160	4.489	13.858	4.094	1.25	0.213
Psychasthenia	21.154	25.511	20.247	6.993	0.43	0.66
Schizophrenia	21.120	11.720	22.447	9.493	0.97	0.33
Hypomania	21.588	5.056	21.576	4.731	0.01	0.98
Social Intraversion	28.965	8.228	29.200	8.126	0.21	0.82

Table 3. Student's t Test Analysis of MMPI Scores.

* $p < 0.05$ Significant p and t values are shown.

Table 4. Student's t Test Analysis of SCL 90-R Scores.

	TMD n = 43		Normal n = 218		t	P
	Mean	SD	Mean	SD		
Somatization	0.971	0.507	0.721	0.506	3.70	0.00*
Obsession	1.253	0.601	1.139	0.540	1.46	0.14
Compulsion	1.136	0.560	1.097	1.349	0.33	0.74
Depression	1.051	0.568	0.988	0.889	0.68	0.48
Anxiety	0.883	0.553	0.781	0.502	1.42	0.15
Hostility	1.075	0.698	0.897	0.586	2.00	0.04*
Phobic thinking	0.571	0.399	0.538	0.454	0.59	0.55
Paranoid thinking	1.102	0.591	0.986	0.614	1.45	0.14
Psychoticism	0.699	0.461	0.627	0.498	1.13	0.26
Global severity index	87.80	39.83	77.01	39.97	2.02	0.04*

*p < 0.05 Significant p and t values are shown.

for sick relatives, and economic problems. The frequency of muscle groups painful to palpation increased in proportion with the frequency of reported stress factors (25). The implication is that these events act as precipitating factors in the onset of these symptoms.

Not only do the mouth and face have unusual emotional significance for the individual, but they also relate to concepts of body image in that the individual interprets a damaged face as a damaged self. Distortion of body image results in anxiety that is frequently expressed as pain (26). This is likely to have an important bearing on the severity and duration of chronic post-traumatic pain syndromes of the maxillo-facial region. This trauma may be not only that of actual tissue damage to the face, but also that of emotional trauma such as that associated with physical or sexual abuse (27,28).

In the post-treatment of patients with joint and pain complaints, it has been indicated that unless the etiological factors are eliminated, there will be little or no success in their treatment. Therefore, the complaints may recur (3). Since it is impossible to eliminate day-time stress, it would be much more useful to teach patients how to handle it (29).

Some researchers characterize TMJDS patients as perfectionist, introvert, unsatisfied, unhappy, compulsive, sensitive to stress, highly responsible, and liable to harm themselves (14,30,31). However, others indicate that the level of depression and anxiety for these patients is

increased if treatment is not given in comparison to the normal (17).

According to the results of psychometric tests, it may be concluded that TMJDS patients usually try to pretend as if they are highly responsible, helpful and congenial; however, the lack of self-criticism and complaints under stress are more frequent. It has also been found that these patients usually react over-sensitively and they tend to somatize their emotional problems.

In our study, a significant relation between TMJDS and personality traits was found (in the subgroups, hysteria, hypochondriasis, of MMPI, Table 3). This significance is also more remarkable in females. This finding is concordant with studies indicating TMJDS frequency in females; between the ages of 10 and 20, it was noted that females have TMJDS four times as frequently as males due to their estrogen hormones. Furthermore, some studies (32,33) also state that in both sexes TMJDS is three times more frequent in puberty than in adulthood. As a result of our study we can say that the personal characteristics of these subjects increased their stress levels and that they were aggressive, anxious, perfectionist, compulsive, wishing to control events, highly responsible and unhappy, unsatisfied and may harm themselves.

Related to our results we may state that, in the treatments of TMJDS, the relation between emotional condition and pain should be taken into consideration

and, thus, it should be kept in mind that psychiatric support may lead to better results in their treatment.

Okeson (34) reported that the evaluation of depression gives better results in the treatment plan of patients with TMJDS and pain complaints. Besides various treatment techniques, medical treatment, as well as some enjoyable activities to avoid anxiety, is often recommended. In addition, anxiolytic drugs are also used in cases in which emotional conditions are apparent. These medications not only relax the elevator muscles but they also reduce parafunctional activity during sleep. Analgesic, anti-inflammatory, muscle relaxants and local anesthetics could be also used with physical treatment approaches (14).

It cannot be concluded that TMJDS patients also suffer from psychiatric disorders. However, it has been noted that these patients have many different personality traits. This difference may make these people more liable to stress and, thus, this increasing emotional stress and TMJDS affect each other in a vicious circle. Principally, this circle must be broken somehow.

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