

POSSIBLE AETIOLOGY OF THE TEMPROMANDIBULAR JOINT DYSFUNCTION⁺

Dr. Sabah.M.Dhuma^{*}

Dr. Bushra.H.Sadik^{**}

Abstract :

Twenty seven cases of TMJ dysfunction had been collected through several specialist dental clinics. This study included 15 males and 12 female patients. The usual age range is between 20 and 60 years, and the mean age in this study was 35. Onset is usually gradual and in this sample the specific problem had been present for a range of 1-3.5 years.

These cases were diagnosed as TMJ dysfunction carefully by specialist dentists and medical centers clinically and radiographically.

Further efforts were done to reduce bias in the collection of data and results related to this study.

This study revealed multifactorial view of aetiology, external and internal inviruments seemed to be the actual causes of TMJ dysfunction such as psychological factors, external trauma, loss of posterior teeth, faulty oral habits, occlusal disharmony and osteoarthritis of the jaw bones. Both sexes and different age groups involved in this disease according to this study.

المستخلص

سبعة وعشرون حالة من حالات اختلال المفصل الصدغي جمعت من خلال عدة عيادات طبية اختصاصية لطب الأسنان. هذه الدراسة تضمنت (١٥) حالة ذكور و (١٢) حالة إناث. وقد تراوحت أعمارهم بين (٢٠-٦٠) سنة حيث أن متوسط عمر المرضى اللذين تمت دراستهم حوالي (٣٥) سنة. التغيرات المرضية لهذه الحالات في هذا النموذج البحثي موجوداً بين فترة تتراوح من ١-٣,٥ سنة. تم تشخيص هذه الحالات بدقة من خلال أطباء أسنان اختصاص ومراكز طبية معتمدة باستخدام التشخيص السريري والشعاعي وقد بذلت جهوداً كثيرة لتقليل الخطأ في جمع النموذج البحثي و النتائج المعتمدة في هذه الدراسة.

اثبتت هذه الدراسة وجود عوامل متعددة خارجية وداخلية تبدو الأكثر عملية في اسباب هذا المرض مثال ذلك العوامل النفسية والشدة الخارجية وفقدان الأسنان الخلفية وبعض العادات الخاطئة للمرضى في الفم، إضافة الى عدم تطابق الفكين بشكل صحيح وبعض الأمراض الالتهابية لعظام الفكين وغيرها. كما اثبتت هذه الدراسة إصابة كلا الجنسين و اعمار متفاوتة بهذا المرض.

Aims of the study :

This study was arranged to identify :

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^{*} B.d D.S., M.Sc – Assist. Lecturer- M.Sc. (Prosth.) Medical Technical Institute of Baghdad

^{**} B.D.S., M.Sc – Assist. Prof. - Medical Technical Institute of Baghdad

1. possible aetiology of the TMJ dysfunction.
2. the relation ship of this disease to the sex and age of the patients.

Introduction :

TMJ is the articulation point between the lower jaw and the cranial base. The mandibular ascending ramus and condyle articulate with the glenoid fossa and articular eminence of the cranial base. The joints are unique as they are hinged bilaterally.

TMJ dysfunction syndrome is typically described as pain in or around the TMJ with associated crepitus or clicking on opening or closing, less commonly there may also be intermittent locking of the joint. This syndrome also includes pain or discomfort from the associated muscles of mastication.

The symptoms are most commonly unilateral. Many studies revealed that female to male preponderance is classically reported as 4:1, the usual age ranges between 20 and 40 years and the specific problem had been present for a mean of 3.6 years. [1]

Other studies [2] showed that the condyle is elliptically shaped with it's long axis oriented mediolaterally. The articuler surface of the temporal bone is composed of the concave articular fossa and the convex articular eminence.

When the meniscus of this joint reduces, the patient often feels click in the joint. In some patients the meniscus remains anteriorly displaced at full mouth opening, this is termed anterior displacement without reduction . Patients with anterior displacement without reduction often can not fully open their mouths. Sometimes there is a tear or perforation of the meniscus. Grinding noises in the joint are often present.

TMJ dysfunction becomes a topic of increasing interest to the dental field over the past last decades.

The clinical symptoms and the pathological changes of the TMJ dysfunction encountered together with the short and long term results of the various treatment employed reflect the complex aetiologic back ground of this dysfunction. The clinical symptoms as a whole of the TMJ disturbances do not give the picture of a single disease but a pathological condition, therefore interpretation of this condition in different patients with regard to possible initiating factors is very difficult. There is very little agreement to the aetiology of functional disturbances of TMJ found in the dental literature. More over, experimental work on animals and human is still unsatisfactory, in spite of the recent progress.[3]

Various theories had been proposed in literature regarding the cause of TMJ dysfunction, most of these theories pointed to that the myospasm lead to pain.

The most accepted theories now a days to explain the TMJ dysfunction and pain are the following:

1. Malocclusion:

Malocclusion of the teeth results in a mandibular displacement usually in the posterior direction and can cause compression of the sensitive soft tissue (bilamellar zone) which is highly vascular and innervated, persistent of this tissue could result in pain as well as impairment of the blood supply to the joint structure, and degenerative changes may be happen as proposed by Laskin [4] who suggested that malocclusion is a factor which may lead to destructive oral habits such as bruxism which may be related to TMJ dysfunction.

2. The neuromuscular theory:

This type of occlusal interference can cause parafunctional activity such as grinding or clenching. However, a background of psychic tension, stress or anxiety is a required adjunctive factor. This theory recognizes the idea that it is not possible to deny the influences of the occlusion on functional remodeling of TMJ, it also recognizes the variable influence of occlusion on masticatory muscle behavior. However the claim that muscle spasm results from occlusal abnormalities remains a controversial one.[5]

3. The muscle theory:

This theory claims that the primary etiological factors lie in the muscles of mastication themselves. TMJ dysfunction can involve the jaw, head and neck. Under stress the muscles of the jaw never relax, therefore tension will increase until a painful spasm occurs, these patients manifest general muscle response in addition to specific ones.

Pain in such muscles in spasm acts as a trigger point and follows a pattern of referral to a variety of other sites. In this theory many of the encountered TMJ disorders are not even remotely related to dental occlusion problems.[6]

4. The psychophysiological theory:

This theory maintains that emotional disturbances (stress, anxiety) may lead to faulty oral habits which are mostly tension relieving ones, (clenching, grinding) which in turn may lead to occlusal interferences which act as sustaining factors, Yemm [7] demonstrated that hyperactivity can be centrally provoked by every day psychological and social difficulties.

Research of psychogenic facial pain done by Feinman and Harris^[8] increases the dentist awareness that stress or emotional illness can cause pain. Because dentists often have little or no training in psychology they are unlikely to be familiar with the administration of antidepressants that have well value in the control of pain.

This study had been conducted on a sample taken randomly from different dental clinics in Baghdad city, diagnosed carefully as TMJ dysfunction. This sample included 15 cases for male patients and only 12 female patients.

These cases were statistically analyzed to evaluate the actual causes for TMJ dysfunction and the relation of these results to the age and sex of patients according to this current study.

Patients and methods:

Twenty seven patients had been collected from different dental clinics in Baghdad city. The sample included 15 male patients and 12 female, collected randomly.

All the patients attended the mentioned dental clinics complaining from unilateral pain in the TMJ. Ages ranged between 20-60 years, with mean of 35 years. All

patients were diagnosed to have TMJ dysfunction because of the absence of other disease entity which could account for the symptoms, history taking, clinical and radiographic examination were conducted by specialists dentists and medical centers. These cases statistically analyzed to detect the actual causes of this disease through out the following of the information related to each patient, then evaluate the factor influences his pathological condition in addition to detect the relation ship of these factors to the age and sex of the patients. Further efforts were done to reduce bias in the collection of the data and the results related to this study.

Results:

The results of possible aetiological factors of TMJ dysfunction are shown in table -1-.

Table (1)

Possible aetiology	Number of patients	Percentages (%)
1. History of psychological disorders	7	25.9
2. Loss of posterior teeth	6	22.2
3. History of faulty oral habits	5	18.5
4. Occlusal disharmony	4	14.8
5. External forces or trauma	3	11.2
6. Osteoarthritis	2	7.4
Total	27	100

Seven patients (25.9%) had a history of psychological disorders. They complained from this disease since more than 3 years. Acute depression, social problems and emotional stress were the most common types of the psychological diseases evaluated by this study.

Six patients (22.2%) had lost of their posterior teeth as possible aetiology, they lost their molar teeth (some or all) since more than 2.5 years, the lost were mostly bilateral, but the complaining of pain for this group of patients were unilateral.

Five patients (18.5%) were having faulty oral habits (one or more) such as, clenching, grinding, nail biting , finger biting and unilateral chewing, this factor considered as aetiological causes of TMJ dysfunction.

Four cases (14.8%) were found with occlusal disharmony mostly latrogenically induced, those patients were presented with Cl II division I and Cl III malocclusion.

Three patients (11.2%) found with a history of external trauma to the TMJ area with the absence of possible other aetiological factors. These external trauma represented by one case was caused by surgical extraction to the lower right wisdom tooth, the other case developed by accident to the TMJ area, and lastly one case caused by some orthodontic treatment.

Two patients (7.4%) were presented with (osteoarthritis) degenerative joint disease obvious on the radiograph, which may be responsible for the symptoms.

Table -2- revealed the relationship between the possible aetiology of the TMJ dysfunction and the sex of the patients as this study appeared.

Table (2)

Possible aetiology	Male	Female	Total
1. History of psychological disorder	1	6	7
2. Loss of posterior teeth	5	1	6
3. History of faulty oral habits	3	2	5
4. Occlusal disharmony	3	1	4
5. External trauma	2	1	3
6. Osteoarthritis	1	1	2
Total	15	12	27

This study reflected that both sexes were affected by TMJ dysfunction.

On the other hand this study showed that the relationship between the possible aetiological factors of TMJ dysfunction and age group were illustrated in table -3-.

Table (3)

Possible aetiology	Age group
1. History of psychological disorders	Different age groups
2. Loss of posterior teeth	50-60 years
3. History of faulty oral habits	40-50 years
4. Occlusal disharmony	Different age groups
5. External trauma	20-30 years
6. osteoarthritis	50-60 years

We found that 50-60 years age group was mostly affected than others, and the mean age was 35 years, also this study revealed that different ages were involved by this disease.

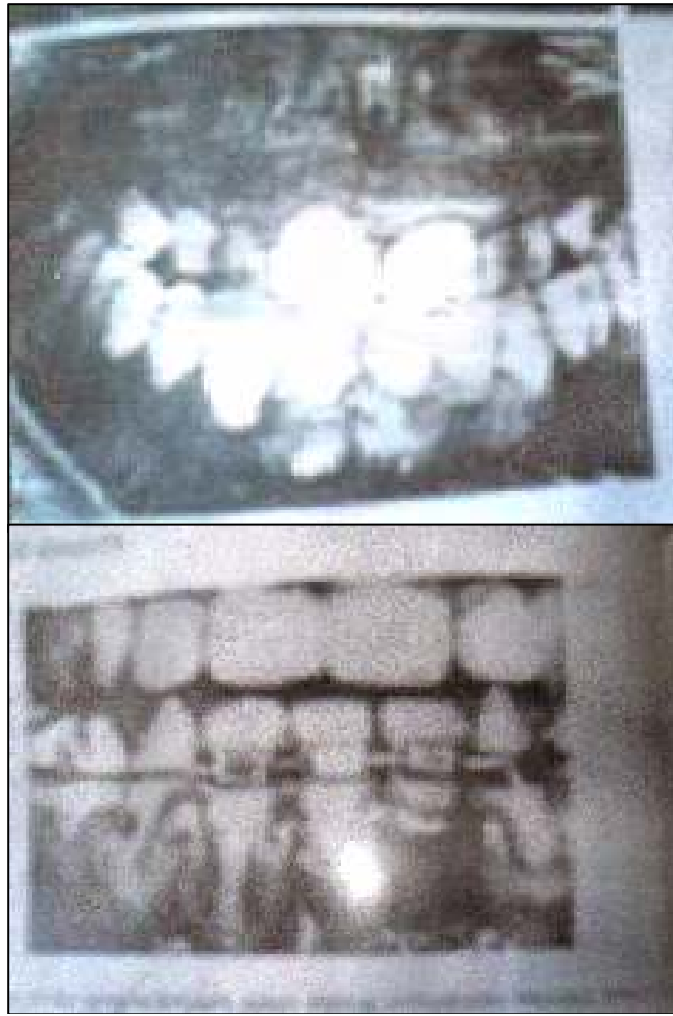


Figure (1):
patient suffered
dysfunction due to
disharmony.

Radiograph for
from TMJ
occlusal

Figure (2): Radiograph for patient developed TMJ dysfunction due to external trauma because of aurthodontic treatment.



Figure (3): Radiography shows unilateral loss of posterior teeth which lead to TMJ dysfunction.

Discussion:

This study illustrated that seven patients of the total studied cases were complaining from psychological diseases, six females and one male patient. The most common causes of this diseases may be related to acute depression, social problems and a history of emotional stress.

When the patients is stress and unable to deal with the condition, he may respond with facial pain due to tension and spasm of the muscles of mastication, some other patients may respond with headache or backache or combination of several.

The long exposure to stress may affect the TMJ movement and lead to irreversable alteration of the joint structures. This study showed that females were more subjected to this kind of problems than males. These findings may be explained that females were less capable to hold problems, so may respond to stress in their facial musculature.

Female patients in this study mainly surffered from acute depression and social problems while the male patient had a history of emotional stress. The social status for those patients were poor with low economical condition.

Also this study illustrated that 6 patients of the total studied cases were having lack of posterior occlusal support unilaterally or bilaterally. It had been claimed that loss of posterior teeth predisposes to traumatic TMJ arthritis either because more pressure results on the joint from biting on front teeth than on posterior teeth, or loss the posterior teeth may lead to loss of occlusal vertical dimension with subsequent distal displacement and over closure of the mandible. Although loss of posterior teeth may be one factor predisposing to traumatic TMJ arthritis and muscle spasm with pain, this is not because of distal displacement and over closure of the mandible but rather because of the disturbed neuromuscular relationship that follows the changes in the occlusion. After extensive loss of teeth, the varying action of the musculature is not buffered by the occlusion, the forces of the musculature will act directly on the joint and create TMJ dysfunction and pain .[1]

In this study 5 males and only 1 females were affected by TMJ dysfunction because of the loss of posterior teeth, while in the study conducted in university of Bristol dental hospital [1], the percentage of females is higher than that of males.

Gray and Quaale [9] noticed a higher incidence of TMJ disorders in patients with extraction of premolars, while in this study the higher incidence of TMJ dysfunction in patients had multiple extraction of molars. This study reflected that those patients had previous poor oral hygiene, four of those patients lost their molar teeth in the left side while two of them lost their molar teeth bilaterally. Some patients used both side for mastication and others used the missing side area for this purposed while only one patient used the healthy area.

Five patients (18.5%) of the studies cases presented with one or more faulty oral habits (clenching, grinding, nail biting, finger biting, unilateral chewing). Patients with CI II occlusion usually try to bring the mandible forward either to bite with their anterior teeth or to improve their facial profile, similar to the conclusion of this study Toller ^[10] estimated that approximately 40% of TMJ dysfunction patients exhibit nocturnal bruxism.

Also this study was in agreement with Laskin study [11] which explained that muscle fatigue in patient with TMJ dysfunction produced by chronic oral habits, such as clenching or grinding of teeth. Those patients had poor dental education.

Four patients (14.8%) were presented with occlusal disharmony, several criticisms of the occlusal disharmony were considered as a causative factors for TMJ dysfunction.

Hayt [12] study agreed with our results that occlusal disharmony may lead to gliding occlusal contact movement and TMJ dysfunction. Also this study agreed with Rabban ^[13] who found that CI II occlusion may be involved by TMJ disorders.

On the other hand this study appeared that external trauma to the TMJ area was one of the possible aetioloogy of the TMJ dysfunction.

In this study three patients were affected, 2male patients and one female performing (11.2%) of the total studied patients were affected by external trauma to the TMJ area, these trauma represented by the following: 1 case blow to the left TMJ area, other case caused by surgical extraction of the lower right wisdom tooth, and the last case because of some orthodontic treatment.

This study was in disagreement with Arat [14] who found that condylar position is not affected by orthodontic treatment and not cause TMJ disorders. But this study agreed with Kummona [15] that TMJ problems may be due to previous trauma.

Finally 2 patients (7.4%) of the total studied cases were presented with degenerative joint disease (osteoarthritis) affected equally both sexes. So our current study agreed with the study of Westesson [16] who found that 50 percent of patients with arthrosis developed TMJ dysfunction.

The results of this recent study were nearly similar to the findings of authors mentioned above in relation to affecting both sexes by TMJ dysfunction, and different age groups were included by this disease.

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