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Original Research

Temporomandibular Joint Hypermobility Manifestation Based on Clinical Observations

Saeid Nosouhian[1], Abbas Haghighat[2], Iman Mohammadi[2], Elham Shadmehr[3], Amin Davoudi[4], Hamid Badrian[5]

Contributors:

[1]Assistant professor, Dental Implants Research Centre and Department of Prosthodontics, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran; [2]Assistant professor, Dental Implants Research Centre and Department of Oral and Maxillofacial Surgery, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran; [3]Assistant professor, Torabinejad Research Centre and Department of Endodontics, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran; [4]Dentistry student, Dental Students Research Centre, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran; [5]Post graduate student, Department of Operative Dentistry, Dental School, Shahid Sadoughi University of Medical sciences, Yazd, Iran.

Correspondence:

Dr. Haghighat A. Department of Oral and Maxillofacial Surgery, Dental Implants Research Center, School of Dentistry, Isfahan University of Medical Sciences, Isfahan, Iran. Tel.: +959132949318. Email: Haghighat@dnt.mui.ac.ir

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Abstract:

Background: Joint range of motion might affected by some factors like laxity and increase joint mobility. Generalized joint hypermobility and temporomandibular joint hypermobility (TMJH) are reported as risk factors for temporomandibular disorders. The aim of this study was to survey the etiological factors of TMJH and its relations to habitual status.

Materials and Methods: In this cross-sectional descriptive study, 69 patients with TMJH were involved. After profiling personal information and medical history, the patients were divided into three groups based on their maximum mouth opening (MMO) as follow:

(Light) MMO of 50-55 mm, (moderate): MMO between 55 and 65 mm, (severe) MMO >65 mm. For subjective observations, patients were asked to fill the prepared questionnaire. The objective evaluations conducted by a specialist. Finally, all the data subjected Chi-Square test by using SPSS software version 22 at a significant level of 0.05.

Results: TMJH was more common in women (74.2%). The light group had significant differences with other groups in the discomfort of TMJ and TMJ sound ($P < 0.05$). Furthermore, sever group manifested highest percentage of masticatory pains, significantly ($P < 0.05$).

Conclusion: It can be concluded that pain in TMJ would have a correlation with MMO.

Key Words: Generalized joint hypermobility, Temporomandibular joint, Temporomandibular joint disorder

Introduction

Temporomandibular disorders (TMD) are called to a group of painful conditions with a prevalence rate of 3-15%, in which temporomandibular joints (TMJs) and/or masticatory muscles are typically involved.[1-3] Patients with TMD frequently complain about multiple bodily pains outside of the orofacial regions.[4,5] TMDs are often described based on some signs and symptoms like: TMJ sounds, impaired mandibular movement, limitation in mouth opening, preauricular pain, facial pain, headaches, and jaw tenderness on function.[6]

In cases of persistent and recurrent pains, TMD may demonstrate a chronic course. TMD is not a life-threatening disease, but the quality of life may be reduced.[7]

Generalized joint hypermobility is a hereditary problem defined by the increase in range of motion in multiple joints, which might affect TMJ in some cases that is named TMJ hypermobility (TMJH).[3,8]

Joint range of motion might be affected by numerous factors including: Biochemical changes in the structure of collagen and elastin, loss of resistance to traction, laxity, and increase joint mobility.[3] Winocur *et al.* conducted a study about the prevalence of general joint laxity and TMJH among adolescent girls. They concluded that the prevalence of generalized joint laxity was 43% and TMJH was recognized in 27.3%.[8]

In another survey, Adair and Hecht discovered that participants with generalized joint hypermobility may be more likely to demonstrate some signs and symptoms of TMD than ones with normal joint mobility.[9]

In another view, correlations between dental occlusion and (TMD) have been proved, also mandibular resting position can be affected by different factors such as: Occlusal interferences, TMD, the position of the head and body of mandible, and emotional tensions, which may lead to bodily adaptations and realignments of tooth and TMJ.[1,10,11]

Due to the fact that generalized joint hypermobility and TMJH are reported as risk factors for TMD,[12] the aim of this study was to clarify the etiological factors of TMJH and its relations to habitual modalities.

Materials and Methods

Ethics: Present article is based on thesis with ID number of UDK:616.724-08.089.23; the survey was executed in

medical and surgical department of Poltava Dental Clinic and Maxillofacial Department of POKB, Ukraine; also a medical consent was filled by each contributors and all procedures were required for treatment plans.

This observational/case-control clinical study was conducted on 69 individuals between the ages of 22 and 42 who had the manifestation of TMJH.

Any severe systemic disease (like rheumatoid arteritis) and un-cooperation were assumed as criteria.

After profiling personal information and medical history, the patients were divided into three groups based on their maximum mouth opening (MMO), which was measured by a disposable ruler between upper and lower incisors:[9]
Light: 25 patients with MMO of 50-55 mm.
Moderate: 18 patients with MMO between 55 and 65 mm.
Severe: 26 patients with MMO > 65 mm.

For subjective observations, patients were asked to fill the prepared questionnaire, with the help of examiner if it was necessary, to reveal following information:

- Discomfort of TMJ during MMO
- Pain in TMJ during MMO
- Pain in masticators
- TMJ clicking or other sounds
- Irradiation of pain in the ear(s), temple or neck
- Usual side of chewing
- Usual side of TMJ which was lied on during asleep
- The first symptoms of TMJH if they were recalled.

The clinical procedure continued with objective tests by an oral and maxillofacial specialist. Then extra oral observation followed as facial asymmetry, condition of the facial musculoskeletal system, functional and morphological changes in the teeth and jaw system and a detailed research of the nature of pathological changes in the TMJ, palpation of TMJ projection zone, manual assessment of muscle tone, movements of the mandible in the horizontal and vertical planes, malocclusion caused by teeth positions, analysis of dynamic occlusion in order to evaluate the performance of jaw movements, the amount of lateral movements of the mandible, passive movement of the mandible, passive compression by means of bilaminar zone adaptation, and dynamic compression for evaluation of ligamentous apparatus, the joint capsule and articular surfaces.

To assess masticatory system specially temporal and medial pterygoid muscles, the shape, size, density, vitality, and pain were tested. Auscultation was performed using stethoscope which was tightly applied to the joint, but without pressure. It was necessary to listen to the noise in the joint space or separate quadrants of the joints. At the end, consultations with orthopedic, dentists, rheumatologist, and neurologist were performed if necessary. All the data subjected to Chi-square test by using SPSS software version 22 at a significant level of 0.05.

Results

This study was conducted on 69 patients (54 women and 15 men), at the age from 22 to 42 years old. The largest number of patients with TMJH was at the age of 31-42 years old (70.99%), while 37.67% were at the age from 26 to 35 years old. Furthermore, the number of women was three times more (78.2%) than men.

Table 1 represents all subjective and objective signs and symptoms of all the groups.

Medical history of patients revealed the presence of familial TMJ diseases in one case of a moderate group. The beginning of disease was gradual in all the periods of remission. Period of illness ranged from 2 to 5 years. Eight patients did not ask for medical treatments, 4 people referred to a dentist, 2 people to otorhinolaryngologist, and 2 others to a neurologist. The main treatment was to assign non-narcotic analgesics and physiotherapy, however, the effects were short-term in 11 people and without success for 5 patients.

Discussion

Based on the results of this study, TMJH was more common in women (74.2%), which is in agreement with other studies.[13-15]

Pain appears to have significant relationship with impairment of oral health related to the quality of life. Pain is induced when an imbalance occurs between the amount of stimuli and the efficacy of modulation mechanisms.[7,16,17] As the result showed, the light group had significant differences with other groups in the discomfort of TMJ and TMJ sound.

In a study with the aim of classifying symptomatic patients diagnosed with TMD into homogenous groups based on their clinical presentation, Pimenta e Silva Machado *et al.* claimed that localized masticatory muscle pain is recognized as the most common complaint in TMD patients.[18] Similar results were found in present study in which sever group manifested highest percentage of masticatory pains, significantly. In that study, pain in TMJ was not considered as an individual complaint.

Recently the most popular theories about etiology of TMDs are based on the biopsychosocial pattern, which is a combination of biological, psychological, and social factors. Quality and pattern of sleeping and stress showed correlation with TMDs.[7,19] Sleeping on affected TMJ was the highest in the light group. Perhaps, the higher level of pain in moderate and sever groups make some uncomfortable sensation during sleeping on the affected TMJ.

Table 1: Distribution of subjective and objective criteria (%) of all the groups alongside with statistical comparisons (*P* value).

Criteria	Groups	Light	Moderate	Severe	*P* values		
					Light versus moderate	Light versus severe	Moderate versus severe
Subjective	Discomfort of TMJ during MMO	88.0	13.0	23.8	0.00	0.00	>0.05
	TMJ pain during MMO	44.0	52.2	57.1	>0.05	>0.05	>0.05
	TMJ sounds	0.0	16.0	15.0	0.00	0.00	>0.05
	Irradiation of pain in temple, ears or neck	48.0	52.2	42.9	>0.05	>0.05	>0.05
	Pain in masticatory muscles	23.8	69.6	84.0	>0.05	0.00	0.00
	Sleeping on affected TMJ	68.0	39.1	42.9	0.04	>0.05	>0.05
Objective	Facial asymmetry	40.0	34.8	38.1	>0.05	>0.05	>0.05
	Mandibular deviation	40.0	34.8	42.9	>0.05	>0.05	>0.05
	Painful Palpation during chewing	52.0	65.2	38.1	>0.05	>0.05	>0.05
	Deep bite	60.0	43.5	23.8	>0.05	0.01	>0.05
	Articular noise	92.0	52.2	47.6	0.00	0.00	>0.05
	Painful palpation during rest	40.0	17.4	23.8	>0.05	>0.05	>0.05
	Painful palpation of median and lateral pterygoid	44.0	39.1	52.4	>0.05	>0.05	>0.05

MMO: Maximum mouth opening, TMJ: Temporomandibular joint

Winocur *et al*. found a positive correlation between TMJH and MMO.[8] This result is in accordance with Pasinato *et al*. study about evaluating clinical and psychosocial aspects in TMD patients with or without generalized joint hypermobility, too.[3] However, Westling and Helkimo did not found a significant relationship between MMO and peripheral joint mobility.[20] Furthermore, Hirsch *et al*. concluded that patients with hypermobility had a lower risk of having limited MMO.[21] Present result hypothesis the correlation between pain in masticatory muscles and higher MMO.

Facial asymmetry and mandibular deviation were not insignificant difference among groups. Inui *et al*. concluded that facial asymmetry due to mandibular lateral displacement is a relatively common problem in TMDs.[22] However, Haghigaht *et al*. reported that condylar distance was higher in posterior and superior borders in TMJH.[23] That might explain the differences.

Articular noise during palpation and auscultation was the highest in a severe group significantly. Ogütcen-Toller believed that clicking and crepitation may be considered as signs of abnormal joint disorder[24] and the present result confirmed it too.

In the present study, a few of individuals sought for the TMJH treatments. Although hypermobility is relatively common in the general population, but reports about musculoskeletal complaints are infrequent. As most symptoms are mild and self-limiting, so patients may not search for medical attention.[25]

Conclusion

Regarding to the limitations of this study like: Low sample size, uneven sample size in groups, limitation of time and etc., it can be concluded that pain in TMJ would have a correlation with MMO.

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