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Clinical spectrum and prevalence of temporomandibular joint disorder: A hospital-based analysis

S.F.B.Zaidi[1], S.Kanwal[2], M.Khan[3], A.Khan[4], A.Rehman[5]

[1,2,3,4,5] Liaquat College of Medicine and Dentistry

Abstract

Objective:

The objective of this study was to determine frequency of temporomandibular joint disorders and its severity among patients presenting with complaints of pain at tempo mandibular joint.

Materials and methods:

a total of 205 patients were selected in this study, the research has been done in unit of oral and maxillofacial surgery at darul-sehat hospital, Karachi. Patients, age 18 to 40 years, with history of diabetes, hypertension, habits of pan/chalia and smoking presented with complain of pain at temporomandibular joint for a period of two weeks were recruited in study. Patients with history of bone & neurological disorder, taking immunosuppressant drug, trauma or surgery of temporomandibular joint were excluded from study. Examinations were carried out by single researcher to ensure the continuity and reliability of answers and interpretation of results. This will also help to eliminate inter-observer biases. Data gathered using a questionnaire and analyzed using SPSS software version 20.

Results:

A total of 205 patients which fulfilled the inclusion criteria were included in the study, including 99(48.3%) males and 106(51.7%) females. The age ranged from 18-40 years were included, belonging to age 15-20 years n=73(35.3%), 21-25 years n=65(31.4%), 26-30 years n=2(1%), 31-35 years n=60 (29%), and 36-40% years n=5 (2.4%). Around 42 (20.5%) patients had history of hypertension while 40 (19.5%) had diabetes, for which they were taking their medicines. History of smoking was seen among 38 (18.5%) patients.

Disease was categorized as mild in 98 (47.8%) patients, moderate in 88 (42.9%) patients and severe in 19 (9.3%) patients. Around 158 (77.1%) had unilateral and 47 (22.9%) had bilateral disorder. Out of 205 patients most of them had temporomandibular joint disorder 192(93.7%).

Conclusion: temporomandibular joint disorder is most common cause of orofacial pain and requires thorough knowledge and adequate examination to diagnose the disorder.

Keywords: temporomandibular joint disorder, diabetes, hypertension, smoking

Introduction

The temporomandibular joint (TMJ) is formed by glenoid fossa of the temporal bone and mandibular condyle and it is separated by an articular disc, which permits hinge and gliding movements (1)

Temporomandibular disorders (TMD) are defined as a group of orofacial disorders characterized by pain in the pre-auricular area, temporomandibular joint (TMJ), or muscles of mastication, limitations and deviations in mandibular range of motion, TMJ sounds during jaw function (2). Temporomandibular joint disorders are complex group of diverse articular or muscular conditions affecting jaw, indistinguishable signs and symptoms, but different mechanisms underlying. The common clinical presentations are pain, noises such as clicking, popping, crepitus or grating, limited jaw movement and locking of jaw (3).

It is estimated that at least 46-50% of the population experience temporomandibular joint disorders (4). The females have been more affected than men, with the mean age of 20-30 years (5). Temporomandibular joint disorder is considered the main cause of orofacial pain. The etiology of temporomandibular joint disorder is multi-factorial related to emotional stress, occlusal

Corresponding Author:

Name: Dr. Syeda Fizza Bano Zaidi

Affiliation: Liaquat College of Medicine and Dentistry

Email: FizzaBano55@yahoo.com

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interference, malposition teeth, loss of teeth, dysfunction of masticatory musculature, intrinsic or extrinsic changes of temporomandibular joint structures (6), trauma and combination of such factors. It is also stated that patients with temporomandibular joint disorders who have habit of bruxism have more severe signs and symptoms of disorder.

Due to high prevalence and variability of complains various studies have been done to evaluate the severity of disorder. In the year 2007 a study done by Loster et al. Concluded that 53.21% of their population had some level of temporomandibular joint disorder (7). In another study karyana et al. Also concluded that 42% of their study sample had mild temporomandibular joint disorder in patients receiving orthodontic treatment. According to the literature, the most frequently reported symptoms are pain in joint, joint clicking/popping and limitation of jaw movements (8). Research and studies determine that the periodicity of pain during mastication, temporomandibular joint (TMJ) pain, and TMJ sounds are good prognostic indicators for determining of TMD severity over a period of time (8, 9).

Many papers point towards the need to have a standardize classification of temporomandibular joint disorders (10). Signs and symptoms and the use of indices is a very effective and economical way to classify a disease and examine its incidence and frequency in any population. It also helps to study etiological factors and the effectiveness of any treatment provided to that population (11).

Helkimo (12) was the pioneer in forming indexes to evaluate and measure the severity of temporomandibular joint disorders. Through this index it is tried to assess an individual in a general population, the prevalence and severity of temporomandibular joint disorders and occlusal instability (12).

The objective and rationale of this study is to determine frequency of temporomandibular joint disorders and severity of disorder among patients presenting with complain of pain. This study to the best of our knowledge is first study in Pakistan which studies the severity of disorder in local population.

Material and methods:

A descriptive cross-sectional, research was carried out in the unit of oral & maxillofacial surgery at darul-sehat hospital from January 2023-june 2023 after approval from **IRB (ref:dsh/irb/2022/0050)**. The sample size was calculated by taking prevalence 20%, confidence level 95%, margin of error 5.5%, and the non-probability consecutive sampling technique was used. In this study we included both male and females, age ranges between 18-40 years, patients presenting with pain at temporomandibular joint area for a period of two weeks, patients with history of diabetes, hypertension and smoking were also included. We excluded all the patients with any bone disorder like rheumatoid arthritis and osteoarthritis, patients who are taking any immunosuppressant drugs, patients who have undergone surgery of temporomandibular joint, patients with any neurological disorder, patients who have history of trauma, and patients who have not gone a dental treatment for last one month.

Data collection:

After approval of from IRB, a total of 200 patients who presented with complain of pain at temporomandibular joint area were selected from oral & maxillofacial surgery outpatient department at darul sehat hospital, Karachi. A consent was obtained from the patients for the inclusion in study.

A questionnaire was designed to assess anamnestic and clinical dysfunction according to helkimo. The patients were seated on a dental chair answered the questions relative to symptoms and classified with respect to degree of dysfunction. The anamnestic examination based on the symptoms reported by patients and clinical examination based on mandibular opening in protrusion and lateral excursions and measured in millimeters. The temporomandibular joint examined for pain and sound and muscles of mastication palpated for tenderness. Following examination patients were classified as 1=mild disorder, 2=moderate disorder and 3=severe disorder.

All the examination will be carried out by the researcher to ensure the continuity and reliability of the answers and interpretation of the results. This will also help to eliminate inter-observer biases.

Data analysis:

Data entered and analyzed on SPSS version 20.0. Mean ± SD was calculated for all quantitative variables e.g. Age, score and duration of pain. The frequencies and percentages were calculated for qualitative variables e.g. Gender, temporomandibular joint disorders, unilateral or bilateral, severity of temporomandibular joint disorders, hypertension, diabetes, and smoking. Effect modifiers like gender, age, pain duration, hypertension, diabetes, and smoking were controlled through stratification. Post stratification chi-square test was applied by taking $p \leq 0.05$ as significant.

Results:

A total of n=205 patients who meets the inclusion criteria were included in the study. Mean age of patients was 24.18 years sd ±6.81, minimum of 18 years and maximum of 40 years. The mean duration of pain was around 7.05 day's ± sd 5.22. The mean score of severity was 1.46 ± sd 0.81. (table 1).

Table 1: descriptive statistics				
Variable	N	Mean	Minimum	Maximum
Age (years)	205	24.18	18	40
Mean severity score	205	1.46	1	3
Dration of pain (days)	205	7.05	1	35

A total of 99 (48.3%) males and 106 (51.7%) females were included in the study. The age ranged from 18 to 40 years were included, belonging to age 15-20 years n=73 (35.3%),21-25 years n=65(31.4%), 26-30 years n=2(1%), 31-35 years n=60 (29%) and 36-40 years n=5 (2.4%). 42 (20.5%) patients had history of hypertension while 40 (19.5%) had diabetes, for which they were taking their medicines. History of smoking was seen among 38 (18.5 %) patients. (table 2).

Table 2: qualitative variable			
Variable		Frequency	Percentage
Gender	Male	99	48.3
	Female	106	51.7
Site	Unilateral	138	67.31
	Bilateral	42	20.4
Hypertension	Yes	42	20.5
	No	163	79.5
Diabetes	Yes	40	19.5

Temporomandibular joint disorder was present in 180 (87.3%) patients and disease was categorized as mild in 86 (47.7%) patients, moderate in 74 (41.1%) patients and severe in 20 (11.1) patients, 138 (77.1%) had unilateral and 42 (22.9 %) had bilateral disorder.

The association of severity was assessed in relation to age sex, comorbid condition and habits of patients using chi square test. Among 180 patients with disorder of temporomandibular joint 89 were females affected with the problem 35 (39.3%) having mild, 39 (43.8 %) moderate and 15 (16.9 %) severe disorder. 91 were males, and 51 (56 %) were with mild, 35 (38.5 %) with moderate and 5 (5.5 %) with severe disorder. There was significant association of temporomandibular joint disorder sex p-value <0.05. (table 3).

Table 3: temporomandibular joint disorder and its severity						
		Severity			Total	P-value
		1	2	3		
Sex	Female	35	39	15	89	0.017
	Male	51	35	5	91	
	Total	86	74	20	180	

Disorder was more common in young age group of age range 15-20 years. 63 patients were affected in 15-20 years of patients having 47 (74.6%), 15 (23.8 %) and 1 (1.6%) as mild, moderate and severe disorder respectively. There was significant association of temporomandibular joint disorder and age p-value <0.05. There were 42 hypertensive patients who had temporomandibular disorder out of which 8(19%), 24(57.1%) and 10 (23.8%) had mild, moderate and severe disorder respectively and it showed significant association p-value <0.05. There were 38 diabetic patients who had temporomandibular disorder out of which 7 (18.4%), 19(50.0%), and 12(31.6%) had mild, moderated and severe disorder respectively and there was significant association p-value <0.05. There were 34 patients who had habit of smoking and 8 (23.5%), 21(61.8%) and 5(14.7%) had mild moderated and severe disorder respectively and there was significant association p-value <0.05. (table 4)

Table 4: other variables					
Severity	1	2	3	Total	P-value
Hypertension	8	24	10	42	0.000
Diabetes	7	19	12	28	0.0000
Smoking	8	21	4	34	0.007

Discussion

The mandibular bone's condyle, which is positioned into the mandibular fossa of the temporal bone, and anatomically forms the temporomandibular joint (tmj) (13). Movement of the joint is usually controlled by the muscles of mastication. Cranial and facial pain involving the temporomandibular joint, muscles of mastication or muscle of the head and neck is a characteristic of temporomandibular disorders (TMD). In the orofacial region, TMD is a primary cause of no dental discomfort. According to studies, 10% to 15% of adults are affected from TMD, and only 5% of them ask for medical treatment. TMD is as common in women as in males, and peak age is between 20 and 40 years, and causes financial burden which is not only due to missed work. From job and multiple drug therapy. The wide spectrum of these disorders is related to its classification which comprises of disk derangement disorders, myofascial pain disorder and autoimmune disorders (15).

It mostly affects young adults and women are likely to be affected more than men. In our study most of the affected age group ranged from 15- 20 years n=73 (35.3%) and 21-25years n=65 (31.4%). While males 106 (51.7%) were mostly affected than females 99 (48.3%). It frequently affects people who are anxious

and stressed. It may sometimes affect certain occupation where it is usually necessary to talk frequently or hold on jaws in open position for example musicians (16).

Clinicians must be expert in assessing and diagnosing TMD in the patients who are affected with pain in the region of temporomandibular joint (17). There are various diseases that usually look alike to TMD which include dental caries, dental abscess, lesions of mucosa (e.g., viral and bacterial ulcerations, lichen planus), habits of patient which result from excessive overuse of muscle (e.g., bruxism, clenching, chewing), previous history of trauma to the region, dislocation of the TMJ, trigeminal neuralgia, primary headache syndrome and giant cell arteritis (18).

In literature, there is wide range of unpredictability in the results because numerous names and criteria have been suggested and formed to describe TMD which are costen's syndrome, temporomandibular joint dysfunction and craniomandibular disorder. Also, TMD is presented with multiple signs and symptoms, but orofacial pain remains a principal symptom of presentation (19, 20).

In a pain report by Nuprin, it was analyzed that in the USA main complain of TMJ region was recurrent and sometimes persistent orofacial pain (88%), in which tooth was not involved ([i]). One survey reported the prevalence of TMD signs and symptoms are reported in 70-80% of young population (21). TMD is usually found in females of 18-35 years range of age.

The diagnosis of the TMD is usually based upon findings of the history and by performing a thorough physical examination of the patient. Mostly patients, usually are asymptomatic but they may present with symptoms of TMJ region which are associated with restricted mobility of mandible upon opening and closing of the jaw, preauricular pain and pain in temporal region (22) along with sounds of the TMJ (clicking, crepitus, popping and grating). A retrospective study conducted over 25 years (n = 4,528), concluded that the most frequent presenting signs and symptoms of Tmd were pain of facial region (96%), jaw dysfunction (75%), headache (79%), and pain of ear (82%) (22)

the patients who are affected by this disorder, only 8% to 10% require treatment, and out of these 10 % of patients 50% of patients undergo gradual resolution of the disease by conservative methods (23). Usually, a multidisciplinary team approach is often beneficial for the diagnosis and management of TMD (24). The prime goal of treatment is to resolve pain and improve jaw movement. In a study conducted by Aloyan et al. Pharmacological management by anti-inflammatory agents, analgesics, antidepressants, opioids, anxiolytics and muscle relaxants along with physiotherapy of the joint is most effective in controlling the signs and symptoms of TMD (25). Most patients' symptoms resolve with the pharmacological therapy along with physiotherapy of the joint. The patients who do not respond to the non-surgical therapy, surgical intervention is also indicated (25).

There were many limitations of the study as sample size was small and it was a single center study. Along with that there were limited resources available to conduct the study. It would be a better study if we incorporated multiple centers and cater large population.

Conclusion:

It is concluded that in our study most of the males were affected and younger people had more prevalence of disorder. This may be attributed to the stress level that they face for the studies or other reasons, and this is an unusual finding in our population and we think that males seek treatment early as compare to females attributed to financial constraints and lack of awareness and knowledge. This study to the best of our knowledge is first study in Pakistan which studies the severity of disorder in local population. Reasons for the prevalence of TMJ disorders need to be studied at national level as it is most commonly seen in our population. It should be differentiated from other diseases of pain in orofacial region which requires thorough knowledge and training as the treatment is dependent upon the severity of disorder and varies from reassurance, medical and surgical treatment.

Conflict of interest: we declare that we have no conflict of interest.

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Dr. Syeda Fizza Bano: Data collection manuscript writing
Dr. Sumera Kanwal: Manuscript writing
Dr. Mariam Khan: Data collection
Dr. Abdullah Khan: Data collection
Dr. Amna Rehman: Idea Creator