Frequency of signs and symptoms of Temporomandibular joint problems in completely Edentulous patients

Afsheen Zakir[1], Muhammad Umer Shah[2], Maida Iqbal[3], Faiqua Yasser[4], Muhammad Waqar Hussain[5], Ayesha Riaz[6]

ABSTRACT

Objective: To evaluate the prevalence and association of Temporomandibular joint problems with age, gender and span of edentulous period in completely edentulous patients.

Study Design: Descriptive cross sectional study.

Place and Duration: Prosthodontic Department of Lahore Medical and Dental College, Lahore from 1st August 2019 to 31st October 2019.

Methodology: Hundred completely edentulous patients seeking complete denture treatment, with no complain of Temporomandibular joint disorders (TMDs) were divided into six age groups, Span of edentulous period was divided in to 4 groups. Examination was carried out for presence or absence of Temporomandibular joint (TMJ) discomfort that includes patients with pain, clicking, limited mouth opening and patients with head, neck muscles pain.

Results: Higher prevalence of TMJ problems was found among female (54%), as compared to the male (46%) patients. Clicking was the most prevalent problem reported in males (17.4%), whereas Head and neck muscle pain was the most prevalent problems in females (14.8%). All TMJ problems (clicking, TMJ pain, limited mouth opening and head and neck muscle pain) were most prevalent in edentulous period of 1-5 years. Association of TMJ problems with age and gender and span of edentulous period was found using Chi Square test. Statistically insignificant association was found with all the parameters. Significance level set at $p < 0.05$.

Conclusion: TMJ problems were most prevalent in early edentulous period of 5 years and had no significant association with age and gender and span of edentulous period.

Keywords: Edentulism, Complete Dentures, Rehabilitation, Temporomandibular joint, Temporomandibular dysfunction, Temporomandibular disorders

How to Cite This:

Zakir A, Shah MU, Iqbal M, Yasser F, Hussain MW, Riaz A. Frequency of signs and symptoms of Temporomandibular joint problems in completely Edentulous patients. Isra Med J. 2020; 12(1): 17-21.

1. Assistant Professor of Physiology, Faryal Dental College, Lahore
2. Assistant Professor of Prosthodontics, College of Dentistry, King Faisal University, Al Ahsa, Kingdom of Saudi Arabia,
3. Demonstrator, Lahore Medical and Dental College, Lahore.
4. Associate Professor of Oral Pathology, Institute of Dentistry CMH LMC, Lahore
5. Associate Professor of Prosthodontics, Bakhtawar Amin Medical and Dental College, Multan
6. Demonstrator, Avicenna Medical College, Lahore.

Correspondence:
Maida Iqbal
Demonstrator, Lahore Medical and Dental College, Lahore.
Email: drsajidnaeem@hotmail.com

Received for Publication: November 19, 2019
1st Revision of Manuscript: January 10, 2020
2nd Revision of Manuscript: March 11, 2020
3rd Revision of Manuscript: June 04, 2020
Accepted for Publication: June 06, 2020

INTRODUCTION

Temporomandibular joint disorders include problems of the muscles of mastication, the Temporomandibular joint and related structures[1]. Balance between various oral functions and the masticatory apparatus is all that is required to keep TMJ complex healthy[2]. Many harmful forces generated by parafunctional habits, the stresses induced by psychological, mechanical and occupational factors can affect the joint functions[3]. Due to the persistent pressure exerted on the joint complex, different signs and symptoms of TMD appear[2]. The high prevalence rate and the complex presentation of its signs and symptoms have made it among one of the most difficult disorders to treat[2,4,5].

In completely edentulous patients, the Temporomandibular joint dysfunction (TMD) can occur due to multiple factors[6]. They include psychological factors, faulty prosthesis (increased or decreased vertical dimension), trauma to TMJ, posterior occlusal wear resulting in incisal interference in complete denture [CD] wearers, and parafunctional habits such as bruxism[7-9]. In edentulous patients signs of Temporomandibular joint disorders include facial pain, headache, joint pain that

aggravates upon mouth opening, tenderness of masticatory musculature, head and neck muscle pain, restricted mouth opening, deviation of the mandible while mouth opening, crepitus, and clicking sounds[10,11].

It has been highlighted in recent literature that females are generally more affected by TMD, similarly long span of time of edentulism without denture results in developing TMJ problems[7,12,13]. Furthermore the number of individuals who see subjective manifestations or signs of TMD is more than the number of individuals looking for treatment[14,15]. Many edentulous patients do not complain about temporomandibular joint problems on a arbitrary examination, may have one or more signs of it[9]. Since it is possible that these problems could lead into a recognizable Temporomandibular Joint dysfunction at a later period. An early recognition of these signs is therefore beneficial. It has been recommended that there should be screening and proper diagnostic programs designed for treating TMJ disorders[16].

This study aimed to determine the prevalence of various Temporomandibular joint dysfunction (TMD) signs in healthy asymptomatic edentulous individuals and denture wearers, who did not have complain of any TMD but presented to the Prosthodontic department for seeking denture treatment. So the objective of the study was to evaluate the prevalence and association of Temporomandibular joint problems with age, gender and span of edentulous period in completely edentulous patients.

METHODOLOGY

This descriptive cross-sectional study was carried out at Prosthodontic Department of Lahore Medical and Dental College, Lahore from 1st August 2019 till 31st October 2019. A sample of hundred completely edentulous patients, 46 males and 54 females seeking complete denture treatment, with no complain of TMDs were selected through non probability purposive sampling. The age ranged was 32 to 90 years. Informed verbal consent was taken. Data collection was done and was recorded on examination forms. Demographic information like age and gender was recorded. Completely edentulous patients requiring set of complete dentures and those with a history of previous denture use were included in this study. Patients with single Complete Denture with opposing natural teeth or partially edentulous arches were excluded from the study. Patients with facial asymmetry, congenital and acquired orofacial defects were excluded. All the patients who had already been diagnosed having TMDs and treated as symptomatic TMD patients were also not incorporated. These 100 patients were divided into decade base six age groups. Span of edentulous period was divided in to 4 groups, i.e., 1-5, 6-10, 11-15, >15 years.

Examination was carried out for presence or absence of TMJ discomfort. TMJ discomfort was divided into four groups: patients with TMJ pain, with clicking, patients with limited mouth opening and patients with head, neck muscles pain.

Pain characteristics (intensity, onset, duration, site, and aggravating, relieving factors) were checked, any previous treatment history and unawareness of having TMJ disorders was also recorded. The limited mouth opening was checked by evaluating the patient's ability to open and close his (her) mouth. The degree of mouth opening was measured by placing 4 fingers in his/her mouth. Popping sounds or clicking, on mouth opening were noticed. Muscles of mastication were palpated for evaluating tenderness. Tenderness of head, neck and back upon muscles palpation was taken as signs of TMJ dysfunction and was recorded. Patients with a history of complete dentures use were also recorded and all four above mentioned TMJ problems were thoroughly evaluated.

Data Analysis: SPSS version 20 was used for statistical analysis and Chi square was used to find out the association between the TMJ problems, complete edentulism, age, gender. Significance level was set at $p< 0.05$.

RESULTS

A total of hundred patients requiring complete denture treatment were evaluated for TMJ problems. The mean age of the patients was 56.6years with the range from 32 to 90 years (SD± 12.07).Out of the total 100 patients' majority, 29.0% were in age group 41- 50 years, and minimum of 3.0% of the patient belonged to 81-90 years age group. Out of the total 100 patients, 46% patients were males and 54% were females. Further, out of the 46% male patients' majority i.e., 14% were in 61- 70 years age group and minimum 3%of patients belonged to 30-40, 81-90 years age group. Similarly in 54%female patients, majority, i.e., 19% of the patients belonged to 41- 50 years age group. The high prevalence of TMJ problems was found in age group 41-50 years (29.0%) whereas least prevalent (3.0%) in age group 81-90 years. Among all age groups, TMJ pain (41.7%), clicking (39.5%) and head and neck muscle pain (41.7%) were more prevalent in age group 51-60 years whereas limited mouth opening was only found in age group 41-50 years (Table-I).

Clicking was the most common sign found in males (61.5%) followed by TMJ pain (50.0%), whereas in females head and neck muscle pain (66.7%) was most prevalent followed by TMJ pain (50.0%). Limited mouth opening was the least prevalent sign in both genders Table-I.

Almost 59.0% of patients had 1-5 years of edentulous period span followed by 29%of patients who had 6-10 years of edentulous span and 10% has 11-15 years of edentulous span and only 2% were in > than 15 years of span of edentulous period (Table-II).

Clicking was most commonly found in edentulous period 1-5 years, (n=10, 16.9%) followed by TMJ pain, (n=9, 15.3%). 10.3% patients had clicking, the most prevalent problem in 5-10 years edentulous period. 20.0% had muscle pain as the most common problem in 11-15 years, however only one patient had muscle pain the only sign in age group >15 years. All TMJ problems (clicking, TMJ pain, limited mouth opening and head and neck muscle pain) were most prevalent in edentulous period of 1-5 years (Table-II).

Table-I: Frequency and distribution of TMD problems with edentulous period and age (N=100)

TMD Problems		Gender		Age					
		Male n = 46	Female n=54	30-40 Yrs (n=9)	41-50 Yrs (n=29)	51-60 Yrs (n=24)	61-70 Yrs (n=27)	71-80 Yrs (n=8)	81-90 Yrs (n=3)
Pain	Absent	40 (45.5%)	48 (54.5%)	9 (10.2%)	25 (28.4%)	19 (21.6%)	25 (28.4%)	7 (8.0%)	3 (3.4%)
	Present	6 (50.0%)	6 (50.0%)	0 (0.0%)	4 (33.3%)	5 (41.7%)	2 (16.7%)	1 (8.3%)	0 (0.0%)
Clicking	Absent	38 (44.2%)	48 (55.8%)	9 (10.5%)	24 (27.9%)	18 (20.9%)	25 (29.1%)	7 (8.1%)	3 (3.5%)
	Present	8 (61.5%)	6 (38.5%)	0 (0.0%)	5 (38.5%)	6 (39.5%)	2 (15.4%)	1 (7.7%)	0 (0.0%)
Limited mouth opening	Absent	46 (46.5%)	53 (53.5%)	9 (9.1%)	28 (28.3%)	24 (24.2%)	27 (27.3%)	8 (8.1%)	3 (3.0%)
	Present	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (100.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Head and neck muscle pain	Absent	42 (47.7%)	46 (52.3%)	8 (9.1%)	26 (29.5%)	19 (21.6%)	26 (29.5%	7 (8.0%)	2 (2.3%)
	Present	4 (33.3%)	8 (66.7%)	1 (8.3%)	3 (25.0%)	5 (41.7%)	1 (8.3%)	1 (8.3%)	1 (8.3%)

Table-II: Frequency of TMJ problems association with edentulous period span (N=100)

TMD Problems		Edentulous period				p-Value
		1-5 yrs n =59	6-10yrs n =29	11-15 yrs n =10	>15 yrs n =2	
Pain	Absent	50 (84.7%)	27 (93.1%)	9 (90.0%)	2 (100.0%)	.655
	Present	9 (15.3%)	2 (6.9%)	1 (10.0%)	0 (0.0%)	
Clicking	Absent	49 (83.1%)	26 (89.7%)	9 (90.0%)	2 (100.0%)	.072
	Present	10 (16.9%)	3 (10.3%)	0 (0.0%)	0 (0.0%)	
Limited mouth opening	Absent	58 (98.3%)	29 (100.0%)	10 (100.0%)	2 (100.0%)	.873
	Present	1 (1.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Ead and neck muscle pain	Absent	52 (88.1%)	27 (93.1%)	8 (80.0%)	1 (50.0%)	.255
	Present	7 (11.9%)	2 (6.9%)	2 (20.0%)	1 (50.0%)	

The association between TMJ problems and the edentulous span was statistically insignificant (p value < 0.05 was kept significant).

Insignificant association of TMD problems (pain, clicking, limited mouth opening) with gender and age was seen. (p value ≤0.05) was considered as level of significance.

DISCUSSION

Various studies have been conducted to find out the prevalence of TMJ disorders in dentate, completely edentulous and partial denture wearers[13,17-20]. In the current study we found out the prevalence of TMJ problems in edentulous patients in a dental college and it was observed that more females (54%) were found having signs of TMD as compared to their male counterparts (46%).The finding of the current study is in agreement with the recent epidemiologic studies that have found women seeking more TMD treatment and also with significantly frequent TMJ problems than men[21-25]. However no conclusive results have been drawn to justify this difference as far as hormonal, psychosocial and behavior contrasts are concerned. In another study on TMJ problems and its prevalence in completely edentulous patients, similar results were obtained e.g., males (56.6%, females 62.5%)[8]. Insignificant association of TMJ problems with age and gender was found in current study (p < 0.05 was set as significant level).

Clicking was the most commonly found TMJ problems in males (61.0%) followed by TMJ pain (50.0%). This finding is in accordance with the study of Shetty[20]. However in contrast AlZarea[6] found limited mouth opening as the most prevalent sign. The joint sounds or clicking in patients wearing complete dentures is related to abnormal condylar surface form. Our results are in accordance with the study of Kirov and Krastev[10] in which clicking (11.54%), muscle tenderness (7.69%) joint pain 5.77%), limited mouth opening (2.88%) in decreasing order of frequency. We have found head and neck muscle pain as the most common sign prevalent in females (66.7%).

The current study reported a decrease in TMD problems as edentulous span increases, (59.0%) in 1-5 years span followed by 29% in 5-10 years, 10 in 10-15 and only 2% in more than 15 years of edentulous period. All TMJ problems had high prevalence in 1-5 years span. In accordance with our study AlZarea [6] found a decrease in signs and symptoms of TMD as edentulous span increases. Similarly, another study also represents that the TMD prevalence decrease with increase age and its prevalence is not related to denture use, number of dentures or age of present denture. These differences may be due to difference in diagnostic criteria, clinical evaluation and the sample size taken[26]. Insignificant association of TMJ problems with span of edentulous period was found in the current study (p<0.05 set as significance level). This is in accordance with the finding of another study that reported that edentulous patients do not present with TMJ problems to the extent as those with natural dentition[20]. This can be due to the fact that proprioception reflex from teeth no more exist to initiate TMJ symptoms. It is debatable that long standing edentulous period in spite of over closure of jaws do not frequently develop TMD[20]. Another school of thought is that due to reduced electromyographic activity in edentulous

patients TMJ overloading and muscle stresses are less[21]. In contrast others stated that loss of teeth causes psychological problems that causes increased stress and thus TMD symptoms[20].

The limitation of the study was its small sample size, as it is a cross sectional study and no control group involved. Strengths were the prevalence of TMD signs were categorized and represented according to age, gender and with edentulous span was well depicted. Future studies with control group and on broader scales should be carried out for giving conclusion that can be applied to a broader category.

CONCLUSION

TMJ problems were most prevalent in early edentulous period of 5 years and had no significant association with age and gender and span of edentulous period.

AUTHOR'S CONTRIBUTION

Zakir A: Statistical analysis
Shah MU: Manuscript writing
Iqbal M: Data collection
Yasser F: Literature review, Data collection
Hussain MW: Conceived idea, Designed research methodology
Riaz A: Manuscript writing

Disclaimer: None.
Conflict of Interest: None.
Source of Funding: None.

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