

The Correlation of Unilateral Chewing Habit with Temporomandibular Joint Disorders

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Abstract

Background: The etiology of temporomandibular disorder (TMD) is considered to be multifactorial, including habits and parafunction. Preference of chewing side, bruxism, wear facets, unstable occlusion, and partial edentulous arches has been reported to be commonly associated with TMD.

Materials and Methods: A cross sectional study was conducted among the outpatient department (OPD) patients of a private institute for a span of two months.

Results: There was a positive association seen between patients with unilateral chewing habit and temporomandibular disorders.

Conclusion: With this study, we have found a high correlation between unilateral chewing habit and the development of TMJ disorders.

Key words: Temporomandibular joint, Temporomandibular joint disorders, Unilateral chewing

INTRODUCTION

Temporomandibular disorder (TMD) is a group of disorders in which exact etiology is still obscure¹ but it is considered multifactorial and includes both physical (peripheral) and psychosocial (central) factors.² There exists a correlation between impaired occlusion with musculoskeletal disturbances of the temporomandibular joint (TMJ).³ Mastication can take place bilaterally at the same time, on the right and left side alternately or consistently on one side, which is then referred to as laterality.⁴ As unilateral masticatory pattern is an expression of impaired function,⁵ it is of interest to find which features are exhibited by persons with unilateral or bilaterally chewing habit, how prevalent masticatory preference patterns are in the population and whether unilateral chewing, as a form of functional asymmetry is related to

other functional or structural asymmetries. There have been very few studies to emphasize the above-mentioned features, and so this study aims to clarify the relationship between the oral habits and TMD signs and symptoms along with the contribution of partial edentulous arches and improper cervical posture in the development of TMD.

MATERIALS AND METHODS

Population and Sample

The study was conducted among the outpatient department (OPD) patients of a private institute of Navi Mumbai, for a time span of 2 months from October 2016 to November 2016. The patients were subjected to a questionnaire regarding the chewing habit (only >3 months were considered as unilateral chewers for the study), pain, sleeping position, history of joint pain and any systemic illness. Patients were checked for tenderness for bilateral TMJ, midline shift, mouth opening, and movements of TMJ. All patients were clinically examined using Type II American Diabetes Association type of examination. Before the start of the study, permission was taken from the respective Head of Departments. The study was cleared by the Institutional Ethical Committee by two

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independent reviewers who suggested few changes, and on resubmission, the clearance was obtained. Participants who gave voluntary informed consent were included in the study.

RESULTS

Our study comprised total 160 participants, who fulfilled our inclusion criteria from the OPD of a private institute in Navi Mumbai, Maharashtra, India. The study was conducted for a period of 2 months from the month October 2016 to November 2016.

The mean age of the study participants was 29.99 ± 10.549 . There were 69 males (43.12%) and 91 females (56.8%) in the study.

Out of these 160 patients, 63 (39.3%) had bilateral chewing habit, and 97 (60.6%) had unilateral chewing habit. Based on the criteria mentioned in materials and methods, of the 97 with unilateral chewing, we found 56 (57.73%) were suffering from TMJ disorders, and 41 (42.2%) were not. This result was found to be highly significant ($P = 0.000$) (Table 1). Thereby we found a positive correlation in the development of TMD in unilateral chewers.

Of the 97 participants who showed unilateral chewing habit, 56 patients (57.7%) were actually suffering from TMD, and 41 patients (42.2%) were not. This was found to be highly significant ($P = 0.036$) (Table 1).

Out of 97 unilateral chewers, 55 patients (56.7%) were right sided of which 30 patients showed TMD and 42 patients (43.2%) were left sided of which 26 patients showed signs of TMD. Development of TMD was seen a maximum in right sided chewers. This was found to be nonsignificant ($P = 0.4593$).

A majority, i.e., 143 patients (89.4%) had undergone some form of dental treatment in the past, of which 25 patients (15.6%) had undergone orthodontic treatment.

Majority of patients 127 patients (79.4%) had the habit of sleeping on both sides left and right side, i.e., had no particular predominant side.

Majority of the patients (146 patients [91.3%]) did not have any adverse habits.

There was no history of any joint diseases in 149 patients (93.1%). There was no history of trauma in the patients except one whose mean trauma duration was 4.62 years f 4.39.

Table 1: TMD and presence of unilateral chewing habit

TMD	Unilateral chewing habit		
	Presence of unilateral chewing habit	Absence of unilateral chewing habit	Total
Present	56	0	56
Absent	41	63	104
Total	97	63	160

P value: 0.000, Z-score - 5.3666, presence and absence of unilateral chewing and bilateral chewing and TMD

TMDs	Presence of unilateral chewing habit
Present	56
Absent	41
Total	97

The Z-score is 2.0894. The P value is 0.036. The result is highly significant at $P < 0.05$

TMD: Temporomandibular disorder

Out of the 97 unilateral chewers, majority respondents, i.e., 62 patients (63.9%) had pain as the reason for unilateral chewing, and 35 patients (36%) had a reason of missing teeth. Out of the 56 patients who had TMD, the reason for unilateral chewing was found to be a pain in 36 patients.

On examining the patients, we found that 54 patients (96.4%) patients out of 56 patients who had TMD showed asynchronous movements and the result was highly significant ($P = 0.000$) (Table 2).

Of the 56 TMD patients, 54 (33.8%) had clicking of the TMJ of which 4 (25) had right side clicking, 12 (7.5) had left side clicking, and 38 (23.8%) had on both sides. Clicking was observed among 53 (94.6) out of 56 patients. This was found to be highly significant ($P = 0.000$) (Table 3).

Of the 56 TMD patients only 9 patients had crepitus, 3 (1.9%) had right side, 2 (1.3%) on the left and 9 (5.6%) had on both sides, and 47(83.9%) did not show crepitus ($P = 0.000$) (Table 3).

A total of 55 patients had a deviation of the jaw while opening the mouth, of which almost equal prevalence of deviation to right 28 (50.9%) and left 27 (49.09%) sides was noted. Of 56 patients who showed clinical signs of TMD, 55 patients (98.2%) had a deviation, and 1 patient (1.8%) did not have deviation. This was found to be highly significant ($P = 0.000$) (Table 3).

Tenderness of TMJ was found in 10 patients (17.8%) out of the 56 patients who had TMD. Of 10 patients, 6 patients (10.7%) had all four muscles of mastication tender (Masseter, Temporalis, Lateral Pterygoid, Medial Pterygoid). 1 of 10 (1.78%) showed only tenderness of masseter muscle. Out of 10 patients, 1 each had tenderness

Table 2: Presence of asynchronous movements and TMD

Synchronous movement	Frequency (%)
Synchronous	2 (3.6)
Asynchronous	54 (96.4)
Total	56 (100)

$P=0.00$ the result is highly significant at $P<0.05$. $Z\text{-score}=-9.84$,
DMT: Temporomandibular disorder

Table 3: Association of various signs and symptoms of TMD with unilateral chewing habit

Criteria	Frequency (%)
Side of unilateral chewing	
Right side	30 (53.6)
Left side	26 (46.4)
Total	56 (100)
$P=0.4593$ the result is not significant at $P<0.05$. $Z\text{-score}=0.7408$	
Clicking seen in TMD patients	
Absent	3 (5.4)
Present	53 (94.6)
Total	56 (100)
$Z\text{-score}=-9.419$. The $P=0.000$ the result is highly significant at $P<0.05$	
Crepitus seen in TMD patients	
Present	9 (19.1)
Absent	47 (83.9)
Total	56 (100)
The $Z\text{-score}$ is -7.091 . The $P=0.000$. The result is highly significant at $P<0.05$	
Deviation seen in TMD patients	
Present	55 (98.2)
Absent	1 (1.8)
Total	56 (100)
$Z\text{-score}=-10.1915$. The $P=0.000$ the result is highly significant at $P<0.05$	
Tenderness of muscles seen in TMD patients	
Present	10 (17.8)
Absent	46 (82.1)
Total	56 (100)
$Z\text{-score}=-6.879$. The $P=0.000$ the result is highly significant at $P<0.05$	

DMT: Temporomandibular disorder

of (1.78%) masseter muscle, (1.78%) temporalis, masseter and temporalis (1.78%) and 1 (1.78%) showed lateral pterygoid, and medial pterygoid tenderness. This was found to be highly significant ($P = 0.000$).

Out of the 56 unilateral TMD patients, we found 11 patients (19.64%) showing signs and symptoms of joint disease. This was found to be highly significant ($P = 0.000$). No joint disease was found in the 63 bilateral chewers.

On examining the midline shift, we noticed that out of 160 patients, 11 patients (6.875%) had midline shift, and all of these were unilateral chewers showing TMD disease. This was statistically found to be highly significant ($P = 0.000$).

DISCUSSION

The results of this study show that preferred unilateral chewing is present in more than half of the population. Based on the criteria mentioned in materials and methods, out of these 97, we found 56 patients were suffering from TMJ disorders, and 41 patients were not. This was found to be highly significant ($P = 0.000$), and thereby we found a marked positive correlation in the development of TMD in unilateral chewers. There have been studies⁶⁻¹⁴ that shows a correlation between unilateral chewing habit and TMD.

Out of 97 unilateral chewers, 55 patients were right sided, and 30 of them showed TMD, and out of 42 patients who were left sided, 26 showed signs of TMD. Development of TMD was seen a maximum in right sided chewers, which was found to be nonsignificant in the study.

Among 97 patients who had unilateral chewing habit, the majority had the reason for unilateral chewing habit due to tooth pain. The other reasons for unilateral chewing were found to be missing teeth, loose teeth or just habitual. In our study, we found a tooth pain to be a major cause for unilateral chewing habit.

On examining the patients, we found a highly significant correlation between asynchronous movements of TMJ and TMD.¹⁵ Tenderness of muscles of mastication was found in 10 patients out of the 56 patients who had TMD, which was found to be highly significant. This finding supports similar report quoted in the textbook of Okeson kes oneness of TMDs and occlusiona,¹⁵ which states the different etiological factors of TMD.

We found that out of all the patients having midline shift, all were unilateral chewers showing TMD disease and this was statistically found to be highly significant (0.000). Occasion has also reported the same finding.¹⁵

54 patients out of 56 who had TMD showed asynchronous movements, and a highly significant association between asynchronous movements and TMD can be established.¹⁵

We also observed a highly significant association of clicking and deviation of jaw with TMD.¹⁵

CONCLUSION

With this study, we have found a high correlation between unilateral chewing habit and the development of TMJ disorders. The pain was found to be the most common cause for unilateral chewing, which emphasizes on how delay in dental treatment and negligence can result in

the development of TMD. If on primary examination itself a brief history of the chewing habit is taken, it may result in early diagnosis and intervention to eliminate the development of TMD. Similar studies have been reported^{16,17} but none on Navi Mumbai, Maharashtra, India population so far. An extensive study should be carried out in a larger sample size for a longer duration to throw more light and establish the relation between unilateral chewing and TMD.

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