



Prevalence of Temporomandibular Joint Dysfunction and Its Signs among the Partially Edentulous Patients in a Village of North Gujarat

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ABSTRACT

There is disagreement about the association between missing teeth and the presence of temporomandibular disorder (TMD).

Aim: To investigate whether, the span of edentulousness, gender, number of quadrants involved, pathological migration and the type of Kennedy's classification are related to the temporomandibular joint (TMJ) dysfunction signs.

Materials and methods: Clinical examination of 250 patients (males 99 and females 151) was done among the age group of 35 to 45 years. The patients were partially edentulous for 6 months or more and did not wear any kind of prosthesis.

Results: Among 250 subjects, females showed more TMJ dysfunction signs. Clicking sounds were present in 46.5%, mandibular deviation was present in 40% of individuals, TMJ tenderness was observed in 32% and masseter was involved in 32% of individual. Temporomandibular joint dysfunction signs in relation to pathologic migration of teeth show that clicking and mandibular deviation was present in 54.5 and 49.2% and among muscles masseter muscle tenderness 41.9% was more commonly present. Masseter muscle tenderness 64.1% was seen in individuals who were edentulous for more than 5 years.

Conclusion: Females subjects had a significantly higher prevalence of TMJ dysfunction signs than male subjects. As the span and time of edentulousness, the number of missing teeth and the number of quadrant involved increased, the signs of dysfunction became more prevalent. Among the TMJ dysfunction signs deviation and clicking sound were most frequently observed. The masseter muscle was most commonly affected and demonstrated muscle tenderness.

Keywords: Temporomandibular joint, Temporomandibular dysfunction, Partially edentulous, North Gujarat, Masseter muscle.

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INTRODUCTION

Temporomandibular disorders (TMD) are a group of conditions characterized by pain or dysfunction in the temporomandibular joint (TMJ) and/or the muscles of mastication.¹ Temporomandibular disorders have become topic of interest in dentistry over the past two decades.

There are conflicting figures related to the incidence of the signs and symptoms of TMD in relation to partial edentulism. Epidemiological surveys reported that 50 to 70% of the population have signs of a disorder at some stage during their life, whereas an estimated 20 to 25% of the population have symptoms of a TMD. However, those who seek treatment represent approximately 2 to 7% of the population.² A higher figure of TMD signs in dentate individuals, were seen when compared with completely edentulous patients.³

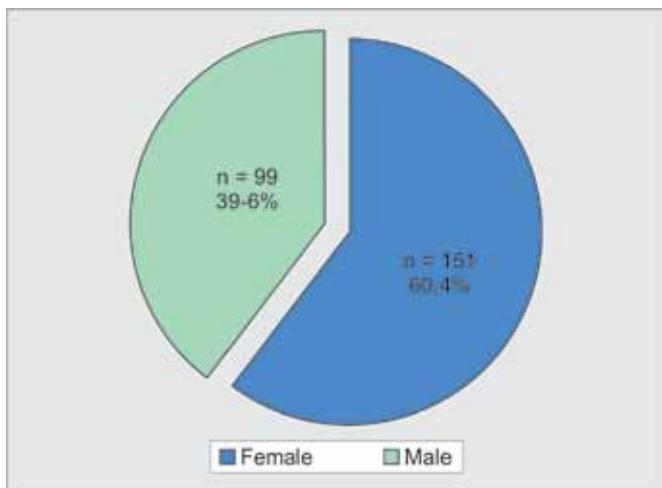
As the association between tooth loss and TMD remain controversial. The prevalence of TMD signs in partially edentulous patients has not been well documented. So it would appear worthwhile to determine the prevalence of TMD signs in partially edentulous patients.

AIMS AND OBJECTIVES

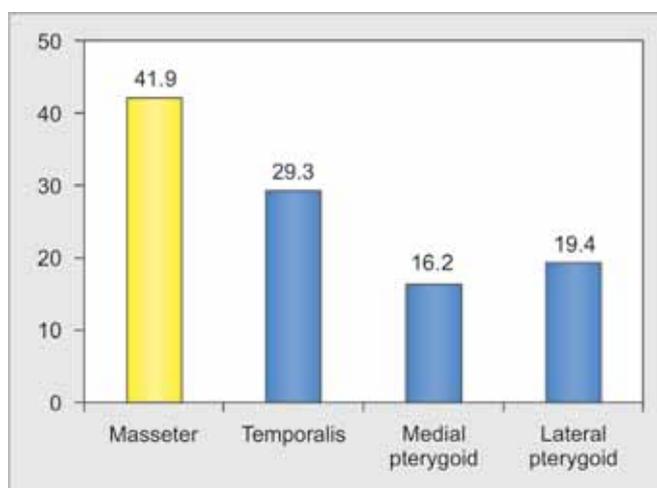
The aim of the study was to assess various TMJ dysfunction signs among the partially edentulous patients. Also an attempt was made to determine whether there is an association between TMJ dysfunction signs and other variables like edentulous span, type of partial edentulism (Kennedy's classification) and dental quadrant with missing teeth.

MATERIALS AND METHODS

The present cross-sectional study was conducted among 250 subjects of Rajghad village of North Gujarat. Those subjects having partially edentulism for at least 6 months or



Graph 1: Result



Graph 2: Muscle tenderness in relation to pathologic migration of teeth

more, having age range from 35 to 45 years were included. Those subjects having any previous history of trauma or muscle disorder was excluded from the study.

A pretested proforma was used for data collection. After informed concern the clinical examination was carried out in a similar way as done by Gray RJM et al.^{4,5} All examination were done by the same dentist (PR). The examiner had been calibrated for assessment by senior (DS).

Joint sound (Clicking and crepitus) were determined with the aid of a stethoscope placed in front of the external auditory meatus.

The maximum jaw opening was measured using a millimeter scale. Pathway of mandibular opening was recorded as follow: straight opening with no deviation, deviation on left side or on right side.

Joint tenderness was determined by bilateral digital palpation posteriorly via the external auditory meatus and laterally over the condyle in the immediate periauricular region.

The masseter and temporalis muscles were palpated bimanually for any signs and tenderness. Superior lateral and medial pterygoid were examined by asking the subjects

to clench their teeth and inferior lateral pterygoid by asking subjects to protrude against resistance provided by examiner.

STATISTICAL ANALYSIS

Data was analyzed by using the Statistical Package for the Social Sciences (SPSS) Version 17.0. Differences in proportions were compared using the Chi-square test. A difference was considered to be of statistical significance if the p-value was <0.05.

RESULTS

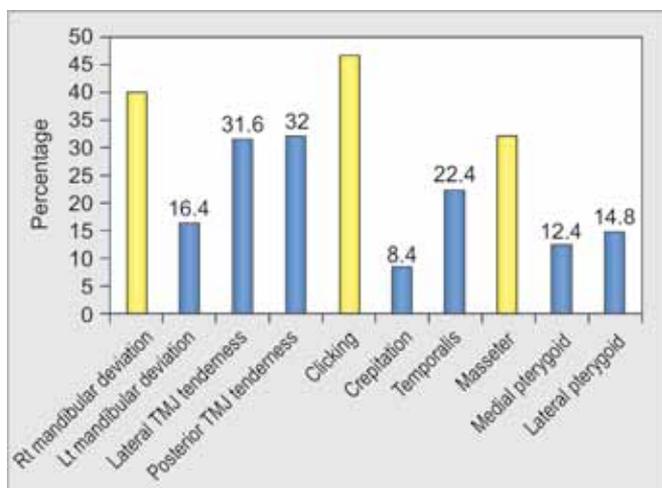
Graph 1 shows the gender-wise distribution of study subjects; out of 250 subjects, 151 (60.4%) were females and 99 (39.6%) were males.

Graph 2 shows the frequency of TMJ dysfunction signs, in which clicking sounds were in (46.8%), mandibular deviation was present in (40%) of individuals, posterior TMJ tenderness was observed in 80 (32%) and masseter was involved in 80 (32%) of individual.

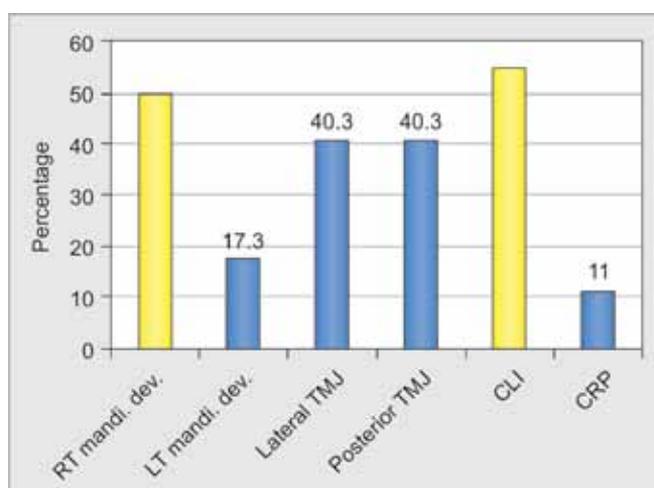
Table 1 shows the various TMJ dysfunction signs in relation to gender, which shows that female were more prone to TMJ dysfunction as compare to male.

Gender	Right mandibular deviation	Left mandibular deviation	Lateral TMJ tenderness	Posterior TMJ tenderness	Clicking	Crepitation
Female	39	21.9	42.3	40.3	50.4	9.2
Male	41.4	9	15.1	19.1	41.4	7.1

Quadrant	Mandibular deviation	Lateral TMJ tenderness	Posterior TMJ tenderness	Clicking	Crepitation
1	12.2	6.1	4.1	20.4	8.1
2	26.6	19	11.4	44.3	1.3
3	50.8	37.7	44.3	50.8	18.1
4	68.9	62.3	68.8	67.3	8.2



Graph 3: Frequency of TMD signs



Graph 4: Various TMD signs in relation to pathologic migration of teeth

Table 2 shows the TMJ dysfunction signs in relation to pathologic migration of teeth, in that clicking (54.5%) and mandibular deviation (49.2%) was commonly seen with pathological migration of teeth.

Table 3 shows the quadrant-wise distribution of TMJ dysfunction signs. Temporomandibular joint dysfunction signs were more commonly seen in the individuals who were having missing teeth in all four quadrant.

Table 4 shows the TMJ dysfunction signs in relation to edentulous span. Temporomandibular joint dysfunction signs were more common in the individuals who were edentulous for more than 5 years.

Graph 3 shows the muscle tenderness in relation to pathologic migration of teeth. Masseter muscle tenderness (41.9%) was more commonly associated with pathological migration of teeth.

Table 5 shows muscle tenderness in relation to edentulous span. Masseter muscle tenderness 50 (64.1%) was seen in individuals who were edentulous for more than 5 years.

Table 6 shows the TMJ dysfunction signs in relation to Kennedy's classification. Class I Kennedy's classification shows more signs of TMJ dysfunction.

DISCUSSION

It has been documented that patients with few remaining natural teeth may have a higher incidence of TMJ dysfunction signs.⁶ However, there is no sufficient evidence of an association between TMJ dysfunction and partial loss of teeth.⁷

In this study, total 250 subjects were examined among them 99 (39.6%) were males and 151 (60.4%) were females.

This present epidemiologic study have found significantly more frequent TMJ dysfunction signs in female than in male and this is supported by studies done by, Hiltunen K et al.⁸ This has been interpreted as, reflect biological, psychosocial and hormonal differences between two groups.⁹ However, there are other epidermiological surveys show that signs and

Edentulous span	Masseter	Temporalis	Medial pterygoid	Lateral pterygoid
<5 years	17.5	13.4	5.2	5.2
>5 years	64.1	42.3	28.2	35.8

Edentulous span	Right mandibular deviation	Left mandibular deviation	Lateral TMJ tenderness	Posterior TMJ tenderness	Clicking	Crepitation
<5 years	32.6	11.6	15.6	18.6	34.8	8.1
>5 years	56.4	26.9	66.6	61.5	73	8.9

Upper Kennedy	Mandibular deviation	Lateral TMJ tenderness	Posterior TMJ tenderness	Clicking	Crepitation
U1	67.7	70.7	81.5	72.3	10.7
U2	53.8	38.4	33.3	64.1	10.2
U3	28.3	11.9	8.6	23.9	8.6
U4	10	10	10	10	0

Table 6: TMD signs in relation to Kennedy's classification

Lower Kennedy	Mandibular deviation	Lateral TMJ tenderness	Posterior TMJ tenderness	Clicking	Crepitation
L1	58	68	78	86	6
L2	53.8	43.5	41.1	56.5	7.6
L3	41.5	16.8	16.9	37.7	12.2
L4	16.6	8.3	8.3	41.7	0

symptoms of TMJ dysfunction are present in both sexes in equal proportion.¹⁰

Joint sound (clicking) is most common sign observed in the selected subjects in this study that is 46%, and mandibular deviation 40% was second most common sign and these findings agree with the study carried by Carlsson GE¹¹ and Akhter R et al.¹²

The results of present study which show association of TMJ dysfunction with pathological migration, with clicking 54.5% and mandibular deviation 49.2% agrees with the results of previous studies, which show secondary changes associated with supraeruption, tipping or drifting and tilting of teeth/tooth is associated with TMJ dysfunction.^{13,14}

In present study, subjects with missing teeth in all four quadrants show significantly higher TMJ dysfunction signs this is in association with study done by MQ Wang et al¹⁵ and Osama et al.¹⁶

This study shows significantly high prevalence of TMJ dysfunction signs in subjects with edentulous span of more than 5 years. Though there are no sufficient evidence to support this results from the results of present study, we infer that with time pathologic migration of teeth/tooth take place resulting in occlusal inaccuracies, missing posterior teeth will cause constant overloading of joint moreover, the existence of a unilateral unique molar induced asymmetric overloading in the TMJ disk without posterior contact and all this factors will effect TMJ leading to TMJ dysfunction in long run.

Association of muscle tenderness with TMJ dysfunction shows that masseter muscle 32% is most commonly involved muscle followed by temporalis and finally lateral pterygoid. This is because of posterior bilateral edentulism patients get habit of clenching to masticate the food Osama A et al.¹⁶

Temporomandibular joint dysfunction signs in relation to Kennedy's classification show that class I Kennedy's classification shows more signs of TMJ dysfunction. There are no sufficient evidence to support this result's reason may be there is no contact between the posterior teeth an overload of the joints appeared. During clenching, a uniform distribution of the dental contact along the maxillary arches prevents the TMJ from overloading. In contrast, severe partial edentulism seems to induce overloading of the TMJ with severity depending on the type of contact.¹⁷

CONCLUSION

There are some evidence to show that there is an association between TMJ dysfunction and partial edentulism. Incidence and intensity of TMD are higher in subjects with greater tooth loss in supporting zone. Missing mandibular posterior teeth may accelerate the degenerative joint disease. In this study, only 25% of patients were without any kind of periodontal disease, mobility, extrusion, drifting, rotation or tilting of tooth or more.

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