



THE INCIDENCE OF TEMPOROMANDIBULAR JOINT DISORDERS AND ITS ASSOCIATION WITH MISSING POSTERIOR TEETH - A CROSS SECTIONAL STUDY

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ABSTRACT

The etiology of TMD is considered to be multifactorial, including habits and parafunction. It has been suggested that unstable occlusion may have a role in the development of TMD. There is disagreement about the association between missing teeth and the presence of temporomandibular disorders (TMD). Here, the purpose was to investigate whether the number of missing teeth, their distribution and age are associated with TMD.

KEYWORDS: Temporomandibular disorders (TMD), missing tooth, Kennedy's classification.

INTRODUCTION

Temporomandibular disorder (TMD) is a collective term that embraces a number of clinical problems that involve the masticatory musculature, temporomandibular joints (TMJ) and associated structures, or both.^[1] They are a group of disorders in which exact etiology is still obscure^[2] but it is considered multifactorial and includes both physical (peripheral) and psychosocial (central) factors.^[3] Some authors have stated that losing molar support is associated with the presence and severity of osteoarthritis^[4] and with TMD.^[5-7] The risk of occurrence of sounds in the temporomandibular joint (TMJ) significantly increased in individuals who had lost more teeth.^[8] Loss of posterior teeth, especially when the number of missing teeth is small, may exert secondary changes, including drifting and tipping of the remaining teeth. The former is the medial or distal movement of a tooth through a stable alveolar ridge and the latter is the movement from a line perpendicular to the alveolar segment. The result of drifting and tipping is the exhibition of secondary changes in occlusal contact, called 'tightly locked occlusion'.^[9] A recently published study showed that tightly locked occlusion was associated with TMD in terms of signs and symptoms, especially in women.^[10] The purpose of this study was to compare the prevalence of TMJ disorders in people with missing teeth and with all teeth present.

MATERIALS AND METHODS

Population and sample: The study was carried out amongst the OPD patients of a private institute of Navi Mumbai, for a timespan of 2 months from November

2016 to January 2017. The patients were subjected to a questionnaire regarding presence of pain, sleeping position, history of joint pain and any systemic illness. Occlusion and number of missing and absent teeth were recorded. Patients were checked for tenderness of temporomandibular joint, midline shift, mouth opening and symptoms of temporomandibular joint disorders. All patients were clinical examined using type II ADA type of examination. Prior to the start of the study permission was taken from the respective Head Of Department. Prior to the study, clearance by the Institutional Ethical Committee by two independent reviewers who suggested few changes and on resubmission the clearance was obtained. Participants who gave voluntary informed consent were included in the study.

RESULT

Our study comprised of total 97 participants, who fulfilled our inclusion criteria from the O.P.D of a private institute in Navi Mumbai. The study was carried out for a period of two months from the month January 2017 to March 2017.

The mean age of study participant was 29.99 ±10.549. There were 50 males (51.5%) and 47 females (48.4%) in the study. Out of these 97 patients, 44 (45.3%) were reported with missing posterior teeth and 53 (54.6%) had all teeth present in the arch.

Based on the criteria mentioned in materials and methods, out of the 44 patients reported with missing teeth, we found that 29 patients (65.90%) were suffering from

temporomandibular joint disorders, and 15 (34.09%) were not. This was found to be highly significant (Z-score = 2.81, p value= 0.004) (Table 1), thereby we found a positive correlation between development of TMD and missing teeth.

Of the 53 participants who showed no missing teeth in the dental arches, 27 (50.9%) were suffering from TMD and 26 (49%) were not.

This result shows that in patients presenting with missing teeth, there is more chances of patients showing TMD compared to patients with all teeth present.

Out of 44 patients reported with missing teeth, all the patients with TMD, i.e. 29 patients out of 41 showed presence of clicking of temporomandibular joint of either one side or both sides. This was found to be highly significant (p value = 0.004) (Z-score = 2.81). A similar

finding was found when the patients were assessed for deviation of the jaw, i.e all 29 patients showed deviation of the jaw, which was also found to be highly significant (Z-score = 2.81, p value = 0.004).

Only 4 patients (13.7%) out of 29 patients having missing teeth as well as TMD presented with tenderness of the muscles of mastication.

The 44 patients were assessed for missing teeth via Kennedy's classification. In both maxillary and mandibular arches, Kennedy's class III was found to be most prominent. However in mandibular arch, it was found to be statistically more significant. 37 patients out of 44 reported with mandibular missing teeth, of which 26 patients (70.2%) reported with Kennedy's class III and 11 patients (29.7%) reported with class I or class II (Z-score = 3.527, p value = 0.00042) (Table 2).

TABLE 1**TEMPOROMANDIBULAR DISORDER AND PRESENCE OF MISSING POSTERIOR TEETH**

		PRESENCE OF MISSING POSTERIOR TEETH	ALL TEETH PRESENT IN THE DENTAL ARCH	TOTAL
TEMPOROMANDIBULAR DISORDER	PRESENT	29	27	56
	ABSENT	15	26	41
TOTAL		44	53	97

The Z-Score is 2.81. The p-value is 0.004. The result is *highly significant* at $p < 0.05$.

There was a statistically significant difference between the presence of missing posterior teeth in maxillary and mandibular arches and presence of TMDs.

TABLE 2**KENNEDY'S CLASSIFICATION OF MISSING TEETH IN THE MANDIBULAR ARCH**

CRITERIA	CLASS I	CLASS II	CLASS III
	7	4	26
Total	56		

The Z-Score is 3.527. The p-value is 0.00042. The result is *highly significant* at $p < 0.05$.

DISCUSSION

The term temporomandibular disorders embraces a number of clinical problems that involve the masticatory musculature, TMJ and associated structures, or both.^[1] The results of the present study show that there is a positive association between the presence of missing posterior teeth and TMDs.^[9,10] This means that the distribution of missing posterior teeth is the most important variable in the present study. In our sample size of 97 patients, patients who reported with presence of one or more miss-

ing posterior teeth was associated with higher risk of development of TMDs. Along with this, there was a positive correlation of distribution of missing teeth^[10] and TMDs w.r.t. Kennedy's classification, Kennedy's classification III was found in both maxillary and mandibular arches in patients with TMD.

Two studies suggest that there is an increase of degenerative changes in the TMJ of young patients with missing molars and disk displacement.^[11,12] Uhac et al., 2002,

suggested the risk of occurrence of sounds in the temporomandibular joint (TMJ) significantly increased in individuals who had lost more teeth.^[8] Studies have shown that when posterior teeth are missing, joint damage and changes in temporomandibular joint are present.^[13-15,16] This suggests that loss of posterior teeth represents a cumulative risk factor in the presence of internal derangement of the TMJ, as suggested by Kopp.^[17]

The limitations of the present study should be discussed. First, TMD is a frequently used diagnostic category that includes a variety of signs and symptoms.^[18] Although the diagnosis of TMD in the present study was made by the same author, it was based on clinical symptoms and signs. TMJ images were not taken into consideration when the participants were classified into different subgroups. Moreover, the TMD disease period and the reasons for and periods of tooth loss were not taken into consideration in this sample analysis, because the participants could not recall them accurately. Second, psychological characteristics have been reported to be a potential cause of TMD.

Psychological factors associated with pain sensitivity influence the risk of the first onset of TMD.^[19] The results should have added some information on whether social/psychological factors have a conclusive effect on the association between occlusion and TMD. Furthermore, there are other known and unknown factors, such as those related to economic conditions, which need to be well-controlled. The above factors should be kept in mind when one considers the present results.

Several reviews have pointed out that evidence suggesting that occlusal factors as a 'cause' for TMD is lacking.^[20-22] Thus, studies on secondary changes in occlusion contact features after posterior tooth loss and studies on the effect of such secondary occlusion changes, together with the possible benefit of correction of such occlusal changes, as well as the effects of age and gender on the onset or diminishing of TMD symptoms and signs, should be conducted in the future.

In summary, the results of this study indicate that when the variables of the number of missing posterior teeth and the number of dental quadrants with missing posterior teeth function together, their effect on TMD increases.^[5-7,23,26-28] Since the possibility of the formation of occlusal interference is higher with the more teeth remaining, the results support the effect of abnormal occlusion on TMD etiology.

CONCLUSION

With this study, we have found a significant association between incomplete occlusion (missing teeth) the development of temporomandibular joint disorders. If on primary examination itself a brief history of the chewing habit is taken, it may result in early diagnosis and intervention to eliminate development of TMD. Similar studies have been performed but currently this seems to be

the first in Navi Mumbai Population.^[23-25] Our short sample size and study duration warrants the need for a larger study sample size done for longer duration. When a patient presents with orofacial pain, a differential diagnosis is necessary to avoid unnecessary dental treatments. The primary goal should be determination of the most probable etiology for the pain, but controversy arises when researchers attempt to identify cause-and-effect factors in the development of a TMD. A positive association between missing teeth and TMJ disorders has been noted. Although the literature of this study does not suggest that replacement of these teeth will prevent the development of TMJ disorders, it emphasizes on how delay in dental treatment and negligence can result in development of TMD.

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