ASSESSMENT OF MISSING POSTERIOR TEETH IN TMD PATIENTS-A RETROSPECTIVE STUDY

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ABSTRACT:

Temporomandibular Disorder (TMD) is a collective term embracing a group of conditions affecting the Temporomandibular Joint and masticatory musculature or both. Due to its etiological complexity and variety of signs and symptoms that may represent other pathologies, recognition and differentiation of the TMDs is not very clear. Missing posterior teeth are of serious concern to patients and the dental professionals. The aim of this study is to assess posterior missing teeth patterns in TMD Patients. This study was conducted in Saveetha Dental College and Hospitals and case records of patients who reported between June 2019 to March 2020 were reviewed. A sample of about 50 TMD patients was included in the study. Posterior missing teeth were evaluated in these patients. The data was entered in SPSS and analysed using Chi square test. From this study it was observed that the majority of TMD patients with missing posterior teeth belonged to the age group of 31-40 years (47.1%) p-value: 0.007 (p<0.05); hence statistically significant. TMD with posterior missing teeth was present more in females (64.7%) compared to males. Majority of TMD patients with missing posterior teeth had Disc condyle disorder (64.7%). (p-value:0.093 (p>0.05); hence statistically not significant). It was observed that pain during mouth opening (58.8%) was the most prevalent sign and symptom seen in TMD patients with missing posterior teeth. Within the limitations of the current study, it can be concluded TMD patients with missing posterior teeth was more common in females when compared to males and in the age group of 31-40 years of age with disc condyle disorder being the most common type of TMD. Thus, proper evaluation of missing posterior teeth will aid in early diagnosis of TMDs.

Keywords: Edentulous, tooth loss, temporomandibular disorders, posterior tooth, shortened dental arch
INTRODUCTION:

The temporomandibular disorder (TMD) is defined as a set of functional and pathological conditions affecting the temporomandibular joint (TMJ), masticatory muscles and tissue adjacent components. Etiology of TMD is multifactorial, and is related to a number of dental and medical conditions, such as occlusion, posture, parafunctional habits, restorative procedures, orthodontic treatment, emotional stress, trauma, anatomy of the disc, pathophysiology of the muscles, genetic and psychosocial factors, age, and gender. Typical signs and symptoms of TMD are pain, limited mouth opening, joint sounds, mandibular deviation, and chewing disability. These symptoms may exist alone or in combination.[1] It is characterized by several signs and symptoms that include facial muscle and joint pain, limitation and/or mandibular deviation in the trajectory, joint noises, headaches, earaches and pain of cervical origin.[2][3] Some authors have stated that losing molar support was associated with the presence and severity of osteoarthritis [4][3] or with TMD [5].

The risk of occurrence of sounds in the temporomandibular joint (TMJ) significantly increased in individuals who had lost more teeth.[6] Loss of posterior teeth, especially when the number of missing teeth is small, may exert secondary changes like 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' [7]

A recently published study showed that tightly locked occlusion was associated with TMD in terms of signs and symptoms, especially in women[8] The smaller the number of missing posterior teeth, the higher the possibility of an individual developing a tightly locked occlusion. This implies that tooth-losers with fewer missing posterior teeth may have a higher risk of the occurrence of TMD.[9]

Our department is passionate about creating awareness on the importance of various oral diseases; we have published numerous high quality articles in this domain over the past 3 years. With this inspiration we planned to pursue research on assessment of posterior missing teeth patterns in TMD patients [10–24]. The association between missing posterior teeth with age, gender, signs and symptoms, types of TMD were assessed. Proper evaluation of missing posterior teeth at an early stage can prevent progression of TMD. Thus the aim of the study was to assess missing posterior teeth in TMD patients.
MATERIALS AND METHODS:

**Study design and setting:**
This is a retrospective study conducted in a university setting (Saveetha dental college and hospitals, Chennai). Thus the data available is of patients from the same geographic location and have similar ethnicity. Approval was obtained from the institutional Ethical committee (IEC). The ethical approval number for the present study is SDC/SIHEC/2020/DIASDATA/0619-0320.

**Sampling:**
In this retrospective study, about 86,000 records of patients who reported to Saveetha Dental College from June 2019 to March 2020 were reviewed. A total of 50 case records of patients with TMD were assessed. 17 TMD patients with missing posterior teeth and 33 TMD patients with no missing teeth in the posterior region were included. Two examiners were involved in the study. Cross verification of data were done with the help of photographs.

**Data collection and tabulation:**
Clinical examination, dental status and photographs of TMD patients were assessed. Data related to age, gender, types of disorders, signs and symptoms and missing posterior teeth was collected. The study involved age groups divided into 18-30 years, 31-40 years, 41-50 years, 51-60 years. Incomplete or censored data was excluded from the study. Cross verification of data were done with the help of photographs. Two examiners were involved in the study. Data was entered in a methodical manner. Data was recorded and tabulated on Excel.

**Statistical Analysis:**
After tabulation using MS Excel, the data was exported to IBM SPSS software [Version 19: IBM Corporation NY USA] for statistical analysis. Independent variables included age, gender, signs and symptoms. Dependent variables included posterior missing teeth. The statistical analysis was done by Pearson Chi square test. Association of age, gender, signs and symptoms, missing posterior teeth in TMD patients were performed. The level of significance was set at p < 0.05.

RESULTS AND DISCUSSIONS:
Out of 50 case records involved in the study it was observed that the Majority of TMD patients has Disc condyle disorder followed by MPDS(n=7;41.2%) and Degenerative disorder(n=2;100%) in the age group of 31-40 years (Pearson’s Chi square value=3.467; df=6; p-value:0.748 (p>0.05); hence statistically not significant) [Figure 1]Multiple missing teeth were 72%, whereas single missing posterior tooth constituted 28%. Mandibular missing posterior teeth were 57%, whereas maxillary missing posterior teeth were 43%. Left side missing posterior teeth were 55%, whereas right side missing posterior teeth were 45%. Right TMD was 55% and left TMD was 45%.
Majority of TMD patients had Disc condyle disorder in females (n=16;51.6) when compared to males (n=15;48.4%). Pearson’s Chi square value=2.562; df=2; p-value:0.278 (p>0.05); hence statistically not significant.

[Figure 2] Majority of the TMD patients with missing posterior teeth belonged to the age group of 31-40 years (n=8;47.1%) followed by 41-50 years of age group (n=6;35.3%), 51-60 years of age group (n=2;11.8%), 18-30 years of age group (n=1;5.9%). (Pearson’s Chi square value=11.995; df=3; p-value: 0.007 (p<0.05); statistically significant.

[Figure 3] Majority of the TMD patients with missing posterior teeth were females (n=11;64.7%) when compared to males (n=6;35.3%). (Pearson’s Chi square value=2.228; df=1; p-value: 1.36(p>0.05); hence statistically not significant.

[Figure 4] Majority of TMD patients with missing posterior teeth had Disc condyle disorder (Green).

Chi square test was done and association between age group and TMD patients with missing posterior teeth was found to be statistically significant(P<0.05). While association between gender, Signs and symptoms and Types of Disorders was statistically not significant(P>0.05).

Thus, from this study it was observed that the number of TMD patients with missing posterior teeth was more prevalent in the age group of 31-40 years. Also, females showed more prevalence missing posterior teeth than males. Most patients with TMD showed Disc condyle disorder as the most common type of disorder and pain during mouth opening as the classic sign and symptoms.

Our study shows that the majority of TMD patients with missing posterior had Disc condyle disorder in females. Other studies showed that missing mandibular posterior teeth may accelerate the development of degenerative joint disease. [25] A positive association between missing mandibular posterior teeth and the presence of disc displacement was found. [25] The effect of disarticulation of the posterior teeth in the treatment of TMD symptoms was found in other studies, [26,27][28] reporting a decrease of symptoms after restoring the anterior guide. During the lateral movement it was observed that there is interference on the non-working or balancing side in 78% of the sample with TMD (34% unilateral and 44% bilateral). Disc displacement with reduction (66.7% of the patients) and muscular tenderness/masseter hypertrophy (62.3%) were the two most prevalent TMD symptoms followed by masticatory myofascial pain (38%) and TMJ pain (29.6%). [29]

In our study it was observed that Pain during mouth opening (n=10;58.8%) was the most prevalent sign and symptom followed by clicking sound (n=2;11.8%), muscle tenderness (n=2;11.8%), Deviation of jaw (n=1;5.9%), restricted mouth opening (n=1;5.9%), Tenderness in TMJ (n=1;5.9%) seen in TMD patients with posterior missing teeth. In other studies, Clenching/grinding was reported by 26.5% of the examined population, clicking by 14.8%.
and difficulty chewing and closing by 3.6%. Significant associations between the number of missing teeth with clenching/grinding (p = 0.05) and difficulty chewing (p < 0.001) were detected. Age and gender showed significant effects on the examined parameters (p < 0.05)[30].

Several reviews have pointed out that evidence suggesting that occlusal factors ‘cause’ TMD is lacking [27,31] Thus, studies on secondary changes in occlusion, contact features after posterior tooth loss together with the possible benefit of correction of such occlusal changes, effects of age and gender on the onset of TMD symptoms and signs should be conducted in the future. A positive association between missing mandibular posterior teeth and the presence of disc displacement was found[25]

This study indicates 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, especially in young women. 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.[32] This value was higher (3%) in the female group than in the male group (0%). [33] The selected population was composed of 300 patients including 232 females (77.3%) and 68 males (22.7%) corresponding to a female-to-male ratio of 3.4:1.[29]

A case control study was conducted to assess the role of posterior tooth loss in development of TMJ disorders. Patients with removable partial dentures to restore lost teeth were used as controls. Outcome measures including patient verified TMD symptoms and clinically verified TMD signs were scored using the Helkimo Index. Results show statistically insignificant difference between posterior tooth loss group and denture wearing group in their association with signs and symptoms of TMD.[34]

This study could pave the way for more research to be done for better understanding of the signs and symptoms of TMD and its association with posterior missing teeth. Also, aid in early intervention and better treatment modalities for improved results. The limitations of the study include limited sample size and limited demographics.
Figure 1: Bar graph depicts the association between age and types of TMD. X axis represents the Age group. Y axis represents the number of patients with TMD. Majority of TMD patients had Disc condyle disorder (Dark Blue) in the age group of 31-40 years. Pearson’s Chi square value=3.467; df=6; p-value: 0.748 (p>0.05), statistically not significant.

Figure 2: Bar graph depicts the association between gender and types of TMD. X axis represents Gender. Y axis represents the number of patients with TMD. Majority of TMD patients had Disc condyle disorder (Dark Blue) among male and female patients. Pearson’s Chi square value=2.562; df=2; p-value: 0.278 (p>0.05), statistically not significant.
Figure 3: Bar graph depicts the association between age group and number of TMD. X axis represents age group and Y axis represents number of TMD patients. Majority of the TMD patients with missing posterior teeth belonged to 31-40 years (Green) when compared to other age groups when compared to other age groups. Pearson’s Chi square value=11.995; df=3; p-value: 0.007 (p<0.05), statistically significant.

Figure 4: Bar graph depicts the association between gender and number of TMD patients. X axis denotes gender and Y axis denotes number of TMD patients. Majority of the TMD patients with missing posterior teeth were females (green). Pearson’s Chi square value=2.228; df=1; p-value: 1.36 (p>0.05), statistically not significant.
**Figure 5:** Bar graph depicting the association between TMD types and number of patients with TMD. X axis represents TMD types of and Y axis represents number of patients with TMD. Majority of TMD patients with missing posterior teeth had Disc condyle disorder (Green). Pearson’s Chi square value=4.743; df=2; p-value:0.093 (p>0.05), statistically not significant.

**Figure 6:** Bar graph depicts the association of signs and symptoms and number of patients with TMD. X axis represents Signs and symptoms of TMD.Y axis represents the number of patients with TMD. It was observed that Pain during mouth opening(Green) was the most prevalent sign and symptom seen in TMD patients with missing posterior teeth. Pearson’s Chi square value=3.263; df=5; p-value: 0.660(p>0.05), statistically not significant.
CONCLUSION:

Within the limitations of the current study, it can be concluded that TMD patients with missing posterior teeth were more in females when compared to males. It was more common in the age group of 31-40 years with disc condyle disorder being the most common type of TMD. Pain during mouth opening was the most prevalent sign and symptom seen in TMD patients with missing posterior teeth. Thus, careful history taking and evaluation of the clinical features such as missing posterior teeth also should be considered for the early diagnosis and treatment of temporomandibular disorders.

REFERENCES:


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