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Prevalence of TMJ Disorders among Dental Students and Its Relation to Malocclusion

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ABSTRACT

The objective of the present study was to evaluate the correlation between temporomandibular joint (TMJ) problems and types of malocclusion in dental students. It was a cross sectional study. Total 200 dental students both males and females, fulfilling the inclusion criteria were selected from Chandra Dental College & Hospital College, Barabanki, India. The age ranged from 17 to 30 years with the mean age 21.38 (±SD 2.281) years. Non probability purposive sampling was used for subjects selection. Informed verbal consent was taken.

The most common type of malocclusion existed among dental students in this study was Class II malocclusion followed by Class I and then Class III. Similarly clicking was found to be the most common TMJ problem out of all that were evaluated.

Correlation between symptoms of TMJ pain with clicking and head and neck pain was significant ($P< 0.05$). Most of the students who had TMJ pain also had clicking, deviation and limited mouth opening. Joint noises were mostly in the form of clicking, 4 students also had crepitus.

It was concluded that there was no significant correlation between TMJ problems and malocclu- sion types. However, among the symptoms, a significant correlation between TMJ pain, clicking, and restricted mouth opening was found.

Keywords: TMJ disorders, Malocclusion, TMJ dysfunction, Facial pain, Occlusal dishormany

INTRODUCTION

The temporomandibular joint (TMJ) is a complex joint and for its proper functioning, harmony of the many structures of the TMJ including mandibular condyles, meniscus, glenoid fossa, ligaments, and muscles is important.1 Limited mouth opening, pain, discomfort and clicking are few common signs and symptoms of temporomandibular disorders (TMD). 2

TMD is term used for combined clinical problems that include the masticatory muscle and the problems of TMJ and associated muscles.3 Schwart defined the TMD, a syndrome that "is characterized by muscle and joint tenderness, increasing dull pain on mouth opening, limited mouth opening, referred pain to the angle of mandible and neck, deviated mouth opening, joint sounds, and headache."4 To keep the

TMJ complex healthy, there should be balance and harmony between the masticatory system and the oral functions.4 External forces generated by different habits, psychological, mechanical and occupational factors affect the functions of this joint.5 Abnormal forces exert too much pressure on this complex that eventually results in signs and symptoms of TMD.2 Complex clinical presentation and high prevalence rate has made it among one of the most difficult disorders to treat. 2, 6 TMD has multi factorial etiology and malocclusion is among one of the most common causes.[8] Malocclusion associated with TMD causes orofcial pain and discomfort.[2] Many epidemiological studies have been presented in Dental literature on the prevalence of the TMD and its relation to malocclusion in different population around the world.[4, 6, 7, 9, 10]

Reported prevalence of malocclusion varies from 30% to 93%.[11, 12] Furthermore associations have been documented between TMD and various aspects of mal- occlusion such as cross bite, open bite, molar distalization, and excessive over jet.[13] Some studies report that malocclusions like Class II increases the susceptibility for joint discomfort. In Class III patients who have anterior jaw displacement has problem in jaw closing. This deviation in closing jaws increases muscle tension and decrease the thresh hold of hyperactivity. It is not clear that malocclusion creates interior changes in joint or not. [14] However study carried out by collecting large data available on electronic data base of Medline stated that it not clear that Class II div II predisposes to TMD. They further reported that non of the occlusal factors were significantly associated with TMD and its signs and symptoms. [15] Similarly few reported no linear relationship between TMD due to bruxism or anterior tooth wear or other occlusal factors. No relation between the rates of various occlusal patterns as a result of teeth abrasion and joint pathologies was found.[16]

An important percentage of students have dental anomalies. It has been recommended that screening and diagnostic programs for TMJ disorders are needed to identify and offer treatment to teenagers with major malocclusion and TMJ muscle pain.[13]

The purpose of the study was to evaluate the relationship between TMJ disorders and various types of malocclusions and to find out its prevalence in Dental students.

MATERIAL AND METHODS

Two hundred Dental students were selected form Chandra Dental College & Hospital College, Barabanki, India. The age ranged was 17 to 30 years and the mean age was 21 years. Out of 200 subjects 77 were males and 123 subjects were females. The study method was cross sectional and non probability purposive sampling was used. It was carried out in 3 months duration from January 2019 till March 2019. Data collection was done by using forms to register examination results. Demographic data like age and sex was recorded. Subjects with a history of TMJ discomfort (muscle pain, clicking, crepitus, and limited mouth opening) were included in the study and those not willing to share their information were excluded. All the patients who had already been diagnosed having TMDs and treated as symptomaticTMD patients were also not incorporated informed verbal consent was taken.

Examinations were divided into two phases. During first phase presence or absence of TMJ problems including clicking, restricted mouth opening, deviation on mouth opening and neck, head and back pains were noted. The malocclusion type was evaluated by checking the molars and canine relations based on Angle's classification. Increase or decrease vertical heights, open bite, cross bite were registered.

Subjects with TMJ discomfort were studied more deeply in the second phase of examination. TMJ problems were divided into five groups: (1) those with TMJ pain, (2) those with clicking, (3) with restricted mouth opening (4) Deviation on opening, and (5) those with head and neck muscles pain.

Characteristics of pain that we checked included intensity, onset, duration, site (around cheek, head and neck, around TMJ by palpation), time of appearance (while talking, early morning , nocturnal, diurnal), aggravating factors (at rest, chewing, swallowing, speaking, opening the mouth), treatment history, unawareness. The restricted jaw movements were assessed by checking the patient's ability to open his (her) mouth, deviation of mandible and mandibular

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movements' coordination. The degree of mouth opening was examined and measured by scale. Noises and clicking, on mouth opening were checked. Muscles of mastication and soft facial tissues were palpated for evaluating tenderness. Tenderness of head and neck region upon muscles palpation was taken as dysfunction and was registered.

RESULTS

Two hundred Dental students were evaluated for TMJ problems and discomfort. Descriptive statistical analysis was done. SPSS version 20 was used and prevalence and correlation between TMJ problems and types of malocclusion was obtained. Out of total 200 Dental students 77 (38.5%) subjects were males and 123(61.5%) were females. The mean age of the students was 21 years with the range from 17 to 30 years SD ± 2.281.

Among 200 students samples, 64 subjects (32%) had Class I molar and canine relations, 68 subjects (34%) had Class II malocclusion, 10 (5%) had Class II div. 2 malocclusion, and 58 subjects (29%) had Class III malocclusion. (Table I)

Out of 200 persons examined, 50(25.0 %) persons suffered from TMJ discomfort and pain, 95 subjects (47.5%) were found having clicking as their major problem. Only 4 out of these had crepitus. Muscle pain was present in 24 subjects (12%) Table I.

Table 1: Frequencies and Percentages

	Frequency	Percentage %
Class I	64	32
Class II	68	34
Class II div 2	10	5
Class III	58	29
TMJ pain	50	25
Clicking	95	47.5
Deviation	35	17.5
Limited mouth opening	31	15.5
Head &neck pain	24	12

Table 2: Pearson's Correlation Between Types Of Malocclusions And Temporo- Mandibular Joint Problems

	(r)	P value
TMJ pain/dis-comfort	.032	.651
Clicking	-.063	.357
Deviation	.910	.008
Head & neck pain	.108	.127
Limited mouth opening	.044	.540
PEARSON'S CORRELATION BETWEEN TMJ PAIN AND OTHER SYMPTOMS		
	(r)	**P value**
Clicking	.422	.000
Deviation	.190	.007
Head & neck pain	.391	.000
Limited mouth opening	.231	.001

Correlation is significant at the 0.05 level

On examination 31 (15.5%) subjects out of 200 had restricted mouth opening however deviation on opening was found in 35 subjects (17.5%) respectively. (Table I)

In patients with Class II, div.2 malocclusion, clicking was the most common complaint than other problem. There was no statistically significant correlation found between malocclusion and TMJ pain (p value 0.651). It means both variables are independent of each other and little relationship exists among them. Table II.

TMJ pain had correlations with restricted mouth opening and head and neck and pain. Moderate correlation that was statistically significant was found with clicking r .422 (p value=.000) Table II.

DISCUSSION

Temporomandibular Joint is made of temporal bone and mandible.[1] It has two distinct motions rotation

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and translation that must work together for its normal functioning.[1] It has a complex position in head and neck region that is why TMJ problems are mostly difficult to diagnose in the beginning.[2] Its proper evaluation and treatment is also controversial.[3] There are many factors responsible for TMJ disorders and malocclusion is one of the most common causes.[2,3] It has been reported that the TMJ discomfort is more prevalent in Class II mal- occlusion cases however no considerable difference was found between its types, (Class II div.1 and Class II div.2 malocclusions.).[1] Results of many studies have shown that almost 50% population has signs and symptoms of TMJ discomfort. Gender predilection was also evident in many studies.[4, 6, 7] Women are more sensitive to disease symptoms; stress in women is more problematic than in men.[4] Furthermore they prefer clinical examination and treatment earlier than men. It was reported by a research that generally 56.6% males reported signs and symptoms of TMD (Temporomandibular disorder) than females.[4] Various previous studies have shown rate of TMD more in females than males (3:1, 8:1, 10:1).[4]

In this study 200 Dental students, mean age 21.38, (SD± 2.28) with TMJ problems were evaluated. Out of 200 subjects 77 were males and 123 subjects were females. 64 subjects (32%) were found having Class I malocclusion, 68 persons (34%) with Cass II div I, 10 (5%) Class II div II malocclusion and 58 subjects (29%) were found having Class III malocclusion.

Similarly Basafa M and Shahabee M[14] in their study have reported 43% patient having Class I malocclusion,12.2 % Class II div I , 7% Class II div II. In a study carried by Perez LS and coworkers, [4] the female patients incidence of TMD was 87.5% however in males it was 12.5 %.

Basafa M and Shahabee[14] had reported correlation level between TMD and Class II malocclusion. They further described the rate of TMD in various maloc- clusion (Class II > Class 1> Class III). This finding is in accordance with the results of the present study in which we also found Class II malocclusion the most prevalent malocclusion and Class III the least.[17] In light of these finding it can be stated that in Class III malocclusion, TMJ discomfort is less. Various scientific studies mentioned the similar result, while in others the opposite result has been mentioned.[17] The difference in the prevalence may be due to the different variations in growth and development, oral habits, genetics and environmental factors. [18, 19, 20]

Basafa M [14] study showed that the rate of incidence of TMD in females was also higher than males. This finding was also in accordance with the results of cur- rent study.

Perez LS et al[4] carried out a study in Mexican stu- dents in public and private schools to check frequency and severity of TMD. They have reported 30% to 93% prevalence of TMD. Patil S and coworkers[4] reported 12.4% patients with TMJ pain and only 10.7% having clicking. Head and neck muscles pain was also reported in these individuals.

In the current study despite of having TMJ problems like clicking and joint noises, TMJ pain was present in 50 persons only whereas 150 persons had no pain. TMJ clicking was present in 95 individuals (47.5%) whereas 52.5% individuals had no clicking problem. Basafa M [14] found 22.1% patients with TMJ discomfort and pain, however clicking was their main problem. Head and neck pain was also present in these patients. (p.029). Perez LS[4] and coworkers also reported 26.1% students having clicking and TMJ muscular pain.

Some other studies have reported presence of positive correlation between Class II maloccusion and TMJ pain ($p < 0.05$).[13, 17]

Dental students beside having other TMJ problems like pain and clicking also found having head and neck muscle pain (12%), whereas 88% had no such pain. Basafa[14] reported 17 (4%) patients with TMJ discomfort along with head, neck, and back pains.

In the present study, limited mouth opening was reported in 31 subjects (15.5%), however 84.5% were having normal mouth opening. Deviation of mandible was present in 35 individual (17.5%) and 82.5% had no deviation. In this study we found that TMJ pain had a strong positive correlation with clicking and head and neck muscles pain.

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In this current study we found weak correlation of malocclusion types and TMJ pain and discomfort r.032. This correlation from a statistical view point at the level α=0.05 was insignificant, P value 0.651 was gained. This finding was in accordance with the study carried out by Basafa M and Shahabee[14] who have also reported no correlation between the two variables. They further stated that among all types of malocclusion highest correlation (that was still statistically insignificant) was present between TMJ problems and Class II malocclusion. In accordance with the present study few researchers stated that TMJ compensates and no pathology appears until very strong causative factors exist.[21, 22]

In contrast to our study, Perez LS et al[4] showed statistically significant correlation between the two variables, ($p < 0.05$). In contrast to present study Graber TM [13] found positive correlation between the two parameters. Some researchers believe that even slight occlusal imbalance may cause TMJ problem. If this was correct, then it would be necessary for all people to have completely perfect occlusion to avoid TMJ and myofacial pain.

CONCLUSION

It was concluded that from this study that there was no significant correlation between malocclusion and TMJ discomfort at a level of α=0.05 among Dental students. Class II malocclusion is the most common type of malocclusion. The correlation between TMJ discomfort, clicking and head and neck pain was significant. It is suggested that specific studies must be done on a wider scale to clear out the exact relation between malocclusion types and TMJ discomfort.

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