



Prevalence Of Temporomandibular Joint Disorders In School Children From Navi Mumbai, India- An Analytical Cross Sectional Epidemiological Study

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Abstract

Introduction: Temporomandibular disorders have become a cryptic issue because of it's multifactorial aetiology. It is a collective term used to describe a subgroup of painful Oro-facial disorders. Symptoms involve pain in the temporomandibular joint region, fatigue of masticatory muscles, limitation of mandibular movement, etc. Children are also known to show symptoms of T.M.D. Stress, anxiety, malpositioning of teeth, dysfunction of masticatory muscles are known to lead to T.M.D.

Aim: This study aims to assess the prevalence of temporomandibular disorders among the children between age 8-12.

Methodology: The study is an epidemiological, cross-sectional study design involving children from the age group of 8 to 12 years. After obtaining an informed consent, a questionnaire will be given to the parents of the selected children, having two parts: basic demographic characteristics of subjects and Fonseca Amanestic questionnaire (in English and local language) and prevalence was determined. The data will be assessed and subjected to statistical analysis using SPSS software version

Result: T.M.D prevalence in combination of mild plus moderate was 34.7% where 33.5 % showed mild T.M.D and 1.2 % showed moderate T.M.D. Headache was the most common symptom seen among children. None of the children had severe T.M. D. in age group between 8 to 12.

Conclusion: The study showed that the overall prevalence of TMD in children low. The prevalence increased with age and the study showed no gender significance

Keywords: Temporomandibular joint, bruxism, anxiety

Introduction

Temporomandibular joint disorder (TMD) is a term which collectively includes problems related to muscles of mastication, TMJ joint and its related structures. ¹ T.M.D are subdivided into two groups: disorders of articular origin and muscular origin including signs and symptoms associated with the temporomandibular joint itself and muscles surrounding the T.M.J respectively. TMD of articular

origin specifically alters the hard and the soft tissues of the TMJ and then affects them. Disk disorders, joint pain, joint disorders, and degenerative joint disease are among the most common temporomandibular joint disorders.² In elderly population, degeneration of joint leads to T.M.D, which primarily occurs because the functional

demands of T.M.J exceeds the repair and remodelling capacity of joint³.

TMD's have a multifactorial etiology ranging from biologic, environmental, emotional, social to cognitive factors. TMJ disorders are related to autoimmune disorders, psychiatric illness and sleep apnea. T.M.D is closely associated with sleep quality and stress.⁴

Around 10 to 15 % worldwide have the condition, however only 5 % require treatment. T.M.D most commonly affects people between the ages of 20 and 40 with women being more affected, twice as compared to males.^{5,6,7} It is seen that 6 to 12 % or about 10 million individuals in the United States suffer from T.M.D.¹ the most frequent cause of orofacial discomfort that is not dental in origin has been identified as T.M.D⁵

According to a systematic review and meta- analysis done by Ligia Figueiredo Valesan et al in 2021 where in 21 articles were included, it was seen that, 31% of adult population suffered from T.M.D.²

T.M.D affects not only adults but also the younger population. The prevalence of T.M.D among children is increasing. A systematic review and meta-analysis by Giuseppe Minervini et al in 2023 states that T.M.D prevalence in children and adolescents between 8 - 19 years varies between 20% and 60% where females have a higher prevalence of TMDs compared to males.⁸

Numerous studies have been carried out on T.M.D among adults across the globe but few have studies have been carried out evaluating T.M.D and its symptoms in children and hence the study was undertaken to assess the prevalence of TMJ disorders among children of ages 8 to 12 years in Navi Mumbai, India.

Materials And Methodology

A cross sectional epidemiological study was carried out among school going children (ages 8 to 12) of Navi Mumbai. $N = [DEFF * Np(1-p)] / [(d / Z)^2 * 1 - \alpha / 2 * (N-1) + p * (1-p)]$ was the formula used for sample size calculation and the derived sample size was 260. The final sample size taken was 337. The institutional clearance committee gave the ethical clearance (IREB/2023/PEDO/08) For the purpose of including children in the study, permission was obtained from

principals of relevant schools and from the parents in writing. Children from ages 8 to 12 years old with parental consent were included in the study. Children undergoing any orthodontic treatment and children having recent history of dental trauma were excluded.

Demographic details of children were included in the first part of questionnaire. It contained personal information, medical and dental history of children along with their habits. The second part of questionnaire was Fonseca Amanestic Questionnaire which is a set of 10 questions whose answer options were yes, no and sometimes. Questions related to difficulty in opening the mouth, difficulty in moving jaw from side to side, neck pain and hearing T.M.J clicking sounds were included. Questions on bruxism and chewing gums was also present. Each answer was given a value: no=0, yes=10 and sometimes = 5. According to these values a final score was charted for each child that classifies individuals as absence (0-15) or presence of T.M.D. If present it was further classified as mild T.M.D (20 -45), moderate T.M.D (50 -65) and severe (70-100).

Result

On analysis mean age of participation was 10.5 with 177 were males and 160 were females. T.M.D prevalence in combination of mild plus moderate was 34.7% where 33.5 % was mild T.M.D and 1.2 % was moderate T.M.D. None of the children had severe T.M. D.

The maximum prevalence of mild plus moderate was seen in 12-year-old with 44 children followed by 11-year-old which had 36 children and 10-year-old which was 25 children. [Table 1] .

Most common symptom seen was headaches which was 44.2% and least common was difficulty in opening mouth which was 2.1%. Clicking was seen in about 17.5 % of children and clenching was seen in 26.7 % of children. 21.1% of children had ear pain. 42.8% of children felt that they had tensed and anxious personality. Neck pain or stiff neck was observed in 20 % of children but only 11.2 % of children complain of muscle pain when chewing and only 7.4% children experience difficulty in moving their jaw from side to side. Lastly only 2.1% of children have difficulty in opening their mouth. [This includes the values for yes and sometimes] [Table 2].

Table 1: Distribution of T.M.D based on the age of the child

Age in years	Classification of severity of T.M.D			Total	p-value
	Absence	Mild	Moderate		
8	35	7	0	42	0.004*
9	23	5	0	28	
10	59	23	2	84	
11	33	35	1	69	
12	70	43	1	114	
Total	220	113	4	337	

*Statistically significant at p<0.05

Table 2: Distribution of study participants according to FONSECA AMANESTIC questionnaire

FONSECA AMANESTIC QUESTIONNAIRE	Scores	Frequency	Percent	p-value
Do you have difficulty in opening your mouth?	0.0	330	97.9	0.00*
	5.0	4	1.2	
	10.0	3	.9	
	Total	337	100.0	
Do you have difficulty in moving your jaw from side to side?	0.0	312	92.6	0.00
	5.0	16	4.7	
	10.0	9	2.7	
	Total	337	100.0	
Do you have fatigue / muscle pain when you chew?	0.0	299	88.7	0.00*
	5.0	20	5.9	
	10.0	18	5.3	
	Total	337	100.0	
Do you have neck pain/stiff neck?	0.0	269	79.8	0.00*
	5.0	54	16.0	
	10.0	14	4.2	
	Total	337	100.0	
Do you have ear pain in the region of TMJ?	0.0	266	78.9	0.00*
	5.0	59	17.5	
	10.0	12	3.6	
	Total	337	100.0	

Did you observe if you have TMJ (click) sound when chewing or when your mouth is open?	0.0	278	82.5	0.00*
	5.0	24	7.1	
	10.0	35	10.4	
	Total	337	100.0	
Did you feel that your teeth are not touching each other (articulated)?	0.0	289	85.8	0.00*
	5.0	25	7.4	
	10.0	23	6.8	
	Total	337	100.0	
Do you get headaches frequently?	0.0	188	55.8	0.00*
	5.0	114	33.8	
	10.0	35	10.4	
	Total	337	100.0	
Do you get tensed or anxious very often?	0.0	193	57.3	0.00*
	5.0	106	31.5	
	10.0	38	11.3	
	Total	337	100.0	
Did you observe if you have any habits such as clenching or grinding your teeth or nail biting?	0.0	247	73.3	0.00*
	5.0	69	20.5	
	10.0	21	6.2	
	Total	337	100.0	

*Statistically significant at $p < 0.05$

Discussion

T.M.J is bilateral and diarthrodial. Mandibular condyle, glenoid fossa and articular eminence work together to generate the action of T.M.J joint. T.M.J and its accompanying structures control mandibular motion and distribute severe stresses brought on by routine activities including chewing, swallowing and speaking. Mostly a group of musculoskeletal degenerative diseases, T.M. D is associated with morphological and functional deformities which include abnormalities of the related muscles and intra-articular discal location and/or structure. Painful joint sounds, restricted or deviating range of motion, and cranial and/or muscular pain known as orofacial pain are the main signs and symptoms.⁹ In a study conducted in Chennai in 2015 where 4197 subjects above 18 years were randomly selected for the study, 53.7% of people showed one or more symptoms of

T.M.D.¹⁰ A study conducted in 2020 in Bundelkhand region of India, wherein 400 people with a mean age of 20.9 ± 2.72 years, it showed that 18 % of people suffered from jaw joint problems.¹¹

Generally assumed to be seen in adults however its signs and symptoms are seen in children also.¹² Growing stress, fear and anxiety, competition, occlusal interferences, postural changes, malocclusion etc. among children are all leading to increasing T.M.D among children as well today¹²

A prevalence study conducted by Beatriz Minghelli et al in 2014 in Portugal among children of ages 5 to 19 years showed 25.2% children suffering from TMD among children. Mild form of T.M.D (22.4%) was mostly seen.¹³ Amal Al Khotani et al conducted a study in 2016 amongst children of Saudi Arabia ages (10-18 years) where 27.2% of children showed T.M.D signs and symptoms. In this study, myofascial

pain which also contributes to headaches is most commonly seen among children. This study supports a significant co relation between T.M.D and self-reported headaches.¹⁴

Kriti Agarwal et al conducted a study in Lucknow in 2016 among children of ages 10 to 15 years where it is observed that about 22.4% of children show T.M.D signs and symptoms. Out of which 19.2% of children showed mild form of T.M. D which was most common and only 2.2% showed moderate T.M. D whereas none of the children showed severe T.M. D. Headache was the most commonly seen symptom among children (86.2%).¹⁵

Similar to this, in the present study, 33.5% of mild T.M. D was seen which was maximum, 1.2% showed moderate T.M.D and none of the children showed severe T.M.D. 44.2% showed headache which was the most common symptom seen in the present study. A person with T.M.D experiences frequent headaches because of activities involving head and neck which are related to the muscular action. This possibly explains the relation of increased headaches because of T.M.D¹³.

Tecco et al (2011) reported that, in Italy, T.M.D affected 28.21% of subjects aged 12 to 15% and 22.58% of those aged 5 to 11 years. In this study which was conducted between ages 5 to 15 years, subjects who were 12-15 years old showed a significantly higher prevalence of myofascial pain which is a symptom of T.M.D than those who were 5-11 years old.¹⁶ This was similar to our study.

Deepak Chauhan et al conducted a study in 2013 in Himachal Pradesh among 9- to 12-year-old children which had an overall prevalence of 2.5%. In this study it was found that among 12-year-olds clicking was seen in 14 children, tenderness in 1 and reduced jaw mobility in 7 children. But in 9-year-olds, clicking was seen in 5 reduced jaw mobility in 3 and no tenderness was seen¹². A study was conducted in Korea by Ahn Hyeon Kim et al in 2016 among 10, 12- and 15-year-olds. This study also shows similar results as above study where 277 of 15-year-old suffered T.M.J pain but only 46 of 10-year-old suffered the pain. T.M.J sounds and limitation of movement was seen in 1,104 and 122 of 15-year children respectively but only 344 and 10 children respectively of 10-year-old exhibited the

symptoms.¹⁷. This shows that there is an increase in age is directly proportional to prevalence of T.M.D

The present study follows a similar trend where the maximum prevalence of T.M.D is 12-year-old children (44) then 11-year-old (36) and 10-year-old (25).

Contrary to most of the above studies which show that females are more significantly affected than males, the present study shows that both males and females are equally affected.

The present study shows an increasing trend in prevalence of T.M.D disorders with an increasing in age showing myriad of symptoms from headaches to habit of clenching and grinding with headache being the most common T.M.D symptom seen among children.

Limitation

Being a self- assessed questionnaire there may have been certain bias which can be eliminated by a clinical examination along with a questionnaire.

Conclusion

The overall prevalence seen was relatively low with 34.7%, where 33.5% of children had mild T.M.D and 1.2% were classified as moderate T.M.D. None of the children suffered from severe T.M.D. The prevalence increased with age and the study showed no gender significance.

Future Considerations

A larger sample size to cover more children of different socio -economic status and different geographical area can give a better picture of prevalence. Spreading awareness among parents and children about causes and treatment of T.M.J disorders is the necessity of the day.

Clinical Significance

Children and their parents will be made aware of temporomandibular joint disorders, its symptoms and suitable solutions to treat them

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