Prevalence of Tooth Wear among Young Individuals with Malocclusion – An Institutional study

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Abstract:*Occlusion is defined as "manner in which the upper and lower teeth intercuspate between each other in all mandibular positions and movements". The development of occlusion is based on the neuromuscular control of the components of the mastication system namely: teeth, periodontal structures, maxilla and mandible, temporomandibular joints and their associated muscles and ligaments. It may lead to gingival recession, mobility of teeth and tooth wear. One such consequence that affects the young individuals was the tooth wear. The aim of the study was to correlate the prevalence of tooth wear among young individuals with malocclusion.The individuals of age group 18-25years (1000students) were included in the study. Out of 1000 Students, 500 were males and 500 were females. The traditional angle's classification was used to access the prevalence of malocclusion and tooth wear was measured with Smith and Knight Index.Our study population showed that tooth wear is more common in participants with class II malocclusion. Among the participants, around 44.8% of males and 37% of females having class II division I malocclusion were affected by tooth wear. Chi square test was used which shows statistically significant association of tooth wear and malocclusion. (p value<0.05). The main etiology of the tooth wear is found to be malocclusion. So we the dental team all around the world should enhance and motivate the young individuals.*
Keywords*: Malocclusion, tooth wear, Occlusion.*

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I. Introduction:

Tooth wear is defined as loss of dental hard tissue by a chemical or mechanical process not involving bacteria[1].Itwas formulated that the masticatory forces and malocclusion attributes to the main etiological factors of the tooth wear. Malocclusion is the incorrect relation between the teeth of the two dental arches when they approach each other as the jaws approximate. Because of this the jaw muscles work harder to bring the jaws to a correct position leading to excessive tooth wear. The aim of our study was to investigate the prevalence of tooth wear among young individuals with malocclusion.

II. Materials And Methods:

A cross- sectional descriptive study was conducted among 1000 individuals (500 males and 500 females) of age group 18-25 years in the outpatient department of Vivekananda dental college and hospital, Tamil Nadu, India from April 2015 to Sep 2015. A total 1000 adult subjects (both males and females) of age 18-25 years were for in this study.
Study design: Cross-sectional descriptive study.
Study location:Vivekananda dental college and hospital, Tamil Nadu, India
Study duration: April 2015 to Sep 2015.

Sample size: 1000 patients.

The criteria for the study samples includes
Inclusion criteria:
1.   Individuals with class I, class II and class III malocclusion and attrition.
2.   Permanent dentition only included.
Exclusion criteria:
1.   Individuals undergoing orthodontic treatment.
2.   Restored tooth surfaces.
3.   Individuals with the habit of bruxism.

Procedure methodology:
The study protocol was approved by the Institutional ethical committee. The study subjects were informed about the study in detail and written consent was obtained from them.Questions pertaining to their age, presence or absence of para-functional habits, presence or absence of any dentinal hypersensitivity were asked to the study subjects.
Each individual was subjected to clinical examination. The clinical examination was done by using mouth mirror and probe in order to identify the malocclusion and the associated surface of tooth wear. The malocclusion of the individuals was assessed using Angle's classification as class I, class II and class III respectively[2].
The tooth surfaces were examined for the dental wear by drying the tooth surfaces using cotton. Four surfaces were examined namely the Buccal (B) or Labial (L), Occlusal (O) or Incisal (I), Cervical (C), Palatal(P) or Lingual (L). The tooth wear was evaluated by using Tooth Wear Index (TWI) from Smith and Knight criteria (1984)[3]. The scoring criteria was
      Score 0: No loss of enamel surfaces on B/L/O/I and no change of contour on C.
      Score 1: Loss of enamel surfaces on B/L/O/I and minimal loss of contour on C.
      Score 2: Loss of enamel exposing the dentin for less than $1/3^{rd}$ of the surfaces on B/L/O/I and defect less than 1mm deep on C.
      Score 3: Loss of enamel exposing the dentin for more than $1/3^{rd}$ of the surfaces on B/L/O/I and defect 1 to 2mm deep on C.
      Score 4: Complete loss of enamel, dentin and pulp exposure on B/L/O/I and defect more than 2mm deep on contour C.
The scoring was done and recorded in the data sheet which included the other details like the type of malocclusion and the associated tooth wear if present.
Statistical analysis:
      The data collected were entered into the SPSS version 11.0 and analyzed for intra-examiner reproducibility. The results were statistically analyzed using Chi-square test.

III.   Results:
      Out of 1000 individuals, 500 (50%) were males and 500 (50%) were females within age group 18-25 years. By using Angle's classification the type of malocclusion was identified and by using Tooth wear index from Smith and knight criteria, the tooth wear was measured. All the collected data were statistically analyzed and the result was tabulated. From the statistical result, **(Table 1)**tooth wear is more common among people with Class II malocclusion and **(Figure 1)** on comparing the gender, tooth wear is more common in males having Class II division I malocclusion than females having Class II division I malocclusion.

Table no 1: Shows comparison of tooth wear and malocclusion across gender.

Malocclusion	Male		Female	
	N	%	N	%
Class I	52	31.9	46	29.3
Class II, Division I	73	44.8	58	37
Class II, Division II	15	9.2	35	22.3
Class III	23	14.1	18	11.4
Total	163	100	157	100

Chi-square value - 10.6, Degrees of freedom = 3, **p-value = 0.014 (Statistically significant)**

IV. Discussion:

Occlusion plays an important role in the masticatory system which includes the functioning of alveolar bone, teeth and the temporomandibular joint. The deviation of the functioning of occlusion results in many problems including the tooth wear. Tooth wear caused by various reasons like dental caries, malocclusion, trauma, carbonated drinks etc. Now-a-days, young individuals are more prone to tooth wear. The impact of tooth wear was considerably severe in few patients and influenced in the quality of life. The dentist has the major role in the maintenance of oral care and esthetics of an individual. In our study, we correlated the prevalence of tooth wear and malocclusion.

A studyin Caucasian population concluded that, a high prevalence of attrition (80.0%) was seen more in males as compared to females with increase in age. On comparing attrition with some of the signs of bruxism it was shown that the restoration fracture and scalloping of the tongue had no relation to the severity of attrition score whereas a significant relation was seen between attrition and tooth sensitivity and ridging of buccal mucosa.[4]

A study inAmerican population of sample size 1530 individuals showed thatthe associated factors for tooth wear in patients visiting dentists and found that in adults, tooth wear was common among males with periodontal disease and who used occlusal splints. In younger patients, they concluded that it was more prevalent in Class II malocclusion patients and in the absence of open bite. They mentioned tooth wear was inconsistently associated with malocclusion.[1]

An Iraquian population study found that prevalence of tooth wear found to be similar in all the three classes of malocclusion and the differences occur only in the pattern of tooth wear, whereas in our study class II malocclusion and males have more tooth wear than the females.[5]

Malaysian populationreported that in 16-year school going children, pathological form of tooth wear was more common than the raw tooth wear and occur more commonly in males than the females.[6]

InRomanian population,Class II division 2 patients have more tooth wear on the occlusal surface and males are more subjected than the females when compared with the neutral occlusion[7].

A retrospective study conducted on Pakistanian population concluded thattooth wear was equal in both maxilla and mandible in class I patients, prevalent in the maxilla of class II, mandibular teeth in class III patients[3].

In our study of South Indian population, the prevalence of malocclusion across gender, class II malocclusion is more common among females and class III malocclusion is more common among males and the prevalence of tooth wear is more common among males when compared to the females.

A study found tooth wear was a prevalent condition in adult population with increasing age and associated with tobacco chewing. There was lack of awareness in patients with initial tooth wear, however as the wear progressed, 74% of patients sought the treatment.[8]

The uniqueness of our study is that on reviewing the literature, only very few studies have been conducted in comparing the tooth wear and malocclusion and none of the studies have compared the prevalence of tooth wear among young individuals with malocclusion in South Indian population.
The limitation of our study was that we did not compare the pattern of tooth wear among the individuals in our study population.

V. Conclusion:

The study concludes that tooth wear is more prevalent in young individuals with class II division I malocclusion and it is more prevalent among males when compared to females.

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