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Prevalence Of Tooth Wear Due To Dietary Factors In Population Of South Karnataka, India.

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ABSTRACT

The aim of the present study was to assess the prevalence of tooth wear due to dietary factors in population of Dakshina Kannada. A total of 2000 patients were taken for the study that was conducted in the Department of Conservative Dentistry and Endodontics, A. B. Shetty Memorial Institute of Dental Sciences, Nitte (Deemed to be University), Deralakatte, Mangaluru and rural satellite centres. The prevalence of tooth wear, that is abrasion, attrition and erosion was found to be 46.2%, 20.6% and 2.4% respectively. The most common age group affected were found to be more than 60 years for abrasion and attrition, and 20-30yrs for erosion. Abrasion was found to be more in males (47.1%) than females (45.1%). Attrition was more in males (20.9%) than in females (20.2%). Erosion was also present more in males (10.1%) than in females (4%). Abrasion was relatively seen more in subjects consuming mixed diet (26.2%) than in those consuming vegetarian diet (22%). In the present study, it can be concluded that the prevalence of tooth wear is seen the most in males and in patients more than 60yrs old. The association of dietary habits, alcohol consumption and other intrinsic factors to tooth wear have also been analyzed. It can be concluded that tooth wear can also be seen in patients consuming mixed diet and intrinsic factors can also be a cause for erosion.

Keywords: Attrition, Abrasion, Erosion, acidic food, dietary factors

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INTRODUCTION

Mechanical wear and tear of tooth substance occurs due to both physiological and pathological means therefore different adaptive strategies have evolved to tackle this situation. A diseased state arises when there is a disturbance in this balance resulting in early dissolution and loss of tooth substance with subsequent involvement of pulpal and periapical tissues. Tooth wear is an irreversible, non carious, destructive process, which results in a functional loss of tooth surface, mainly caused by acids in our diet, grinding of teeth, regurgitation of stomach acids and lifestyle factors. The loss of enamel eventually causes tooth sensitivity and affects the appearance and function of teeth[1].

In1990, Grippo hypothesised that attrition, abrasion, erosion and abfraction were the 4 main categories into which non carious lesions could differentiated into. The wearing of tooth substance as a result of tooth to tooth contact during normal or para functional masticatory activity is called attrition. Pathological wear of tooth substance through bio-mechanical frictional processes is known as abrasion[2]. Erosion is the loss of tooth substance by acid dissolution of either an intrinsic or extrinsic origin, e.g. gastric acid or dietary acids. The pathologic loss of tooth substance caused by biomechanical loading forces (flexure of the tooth) at a location away from the point of loading is called abfraction[3].

The etiology of wear of tooth is known to be multifactorial which include diet, bruxism, para functional habits, gastric regurgitation, medicaments, environment and occupation being the most common. The individual wear mechanisms rarely act alone but mostly interact with each other as shown by clinical and experimental observations. The potentiation of abrasion by erosive damage is the most important interaction recorded with respect to the dental hard tissues[4]. Dentin hypersensitivity is mostly caused tooth wear and its processes. Saliva provides the major protective function against wear due to pellicle formation, buffering, acid clearance, and hard tissue remineralization[5].

Diet is one of the etiological factors of tooth wear. Acidic foods and drinks have a major role for the progression of tooth wear. Any solution with a lower pH value may cause loss of tooth structure since the critical pH of dental enamel is approximately 5.5, particularly if the attack is of longer duration and is repeated over time. The total acid level (titratable acid) of dietary substances is considered more important than their pH, because it will determine the actual H^+ available to interact with the tooth surface. The cause of tooth wear being multifactorial it is difficult to pinpoint a major cause for a particular condition[6].

MATERIALS AND METHODS

This study was done on a total population of 2000 patients over a time period of 1 month from June 2018-July 2018 out of which 1000 were examined from the out patient section of department of Conservative Dentistry and Endodontics and the other 1000 were examined in the Rural Health Centres of A. B. Shetty Memorial Institute of Dental Sciences, Nitte (Deemed to be university), Deralakatte, Mangaluru.

Information was collected on socio demographics like age, gender, residence, dietary habits, frequency and form of sugar intakes, adverse oral habits, consumption of alcohol, acidic food etc. Permission to conduct the study will be sought from the relevant authorities. Verbal consent of the patient was obtained. Tooth wear due to dietary factors was assessed using a structured questionnaire. Data was recorded on prepared survey form based on the WHO Oral Health Assessment Form 2013.

The questionnaire was designed so as to evaluate the prevalence of tooth wear due to dietary habits. Patients were examined to assess the prevalence of tooth wear. Clinical oral examinations were done on the dental chair using sterile diagnostic instruments such as mouth mirror, tweezers and a straight probe. The subjects were examined under good illumination. Clear history of possible etiological factors such as dietary factors, habits, medical history were recorded. Each tooth was examined individually for the presence of abrasion, attrition and erosion according to their clinical appearance.

Two clinicians were handling one patient, with one examining the patient while the other recorded the findings on the survey form. Both the clinicians were dental practioners and well versed with the findings and recording criteria.

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RESULTS

Among the 2000 subjects examined 1076 were males and 924 were females which is 52.3% and 47.7% of the population respectively. The prevalence of tooth wear that is abrasion, attrition and erosion was found to be 46.2%, 20.6% and 2.4% respectively.

TABLE 1: Prevalence of tooth wear in Dakshina Kannada population:

TOOTH WEAR	FREQUENCY	PERCENTAGE
ABRASION	924	46.2%
ATTRITION	412	20.6%
EROSION	48	2.4%

The most common age group affected were found to be more than 60 years for abrasion and attrition and 15-30yrs for erosion.

TABLE 2: Prevalence of tooth wear in relation to age group:

AGE GROUP	ABRASION	ATTRITION	EROSION
15-30	178(47.3%)	66(23.9%)	18(4.8%)
30-45	350(46.7%)	132(17.6%)	12(1.6%)
45-60	250(41.8%)	112(18.7%)	16(2.7%)
>60	146(52.9%)	102(27.1%)	2(0.7%)
Chi square value	9.89	17.05	14.7
p-value	0.2	0.1	0.2

Abrasion was found to be more in males (47.1%) than females (45.1%). Attrition was more in males (20.9%) than in females (20.2%). Erosion was also present more in males (2.5%) than in females (2.2%).

TABLE 3: Prevalence of tooth wear in relation to gender:

GENDER	ABRASION	ATTRITION	EROSION
MALE	518 (47.1%)	230 (20.9%)	28 (2.5%)
FEMALE	406 (45.1%)	182 (20.2%)	20 (2.2%)
Chi square value	0.78	0.14	0.22
p-value	0.38	0.71	0.64

Abrasion was relatively seen more in subjects consuming mixed diet (52.2%) than in those consuming vegetarian diet (47.1%). Attrition was more in subjects having mixed diet (51.4%) with no statistical difference between the patients having vegetarian diet (23.2%). Erosion was high in patients having mixed diet (2.7%) than in those having vegetarian diet (2.4%) with no difference statistically.

TABLE 4: Prevalence of tooth wear in relation to dietary habits:

TYPE OF DIET	ABRASION	ATTRITION	EROSION
VEGETARIAN	276 (47.1%)	136 (23.2%)	14 (2.4%)
MIXED DIET	648 (52.2%)	652 (51.4%)	34 (2.7%)
Chi square value	2.81	4.39	4.02
p-value	0.25	0.11	0.13

Abrasion was more in subjects with para functional habits (28.2%). Attrition was significantly high in patients with para functional habits (18.1%) and with opposing prosthesis (39.4%). Association of erosion in subjects with para functional habits (10.3%) and opposing prosthesis (5.3%) were more but there was no statistical difference with the subjects without para functional habits and no opposing prosthesis.

TABLE 5: Prevalence of tooth wear in relation to para functional habits and opposing prosthesis:

	ABRASION	ATTRITION	EROSION
PARA FUNCTIONAL HABITS	11 (28.2%)	174 (18.1%)	4 (10.3%)
OPPOSING PROSTHESIS	34 (25.8%)	52 (39.4%)	7 (5.3%)

The consumption of alcohol, acidic food and other intrinsic factors were analyzed separately with erosion. There was no significant difference found.

TABLE 6: Prevalence of erosion in relation to reasons:

REASONS	EROSION
ALCOHOL	36 (4.0%)
ACIDIC FOOD (EVERY FORTNIGHT)	24 (5.9%)
INTRINSIC	7 (9.7%)

DISCUSSION

Tooth wear is a multifactorial process which usually involves the interaction of physical and chemical agents.[9] This study was conducted on patients of different age groups with different dietary habits among the Dakshina Kannada population.

In the total population of 2000, 1076 were males and 924 were females with the maximum number of patients in the age group of 20-30 years. Among these, 430 belonged to the urban area, 692 belonged to the peri urban area and 878 belonged to the rural areas.

Abrasion is seen more in males (47.1%)along with attrition (20.9%) and erosion (2.5 %) which are also more in males. The females of South Karnataka exhibited lesser erosive lesions as they generally tend to avoid alcoholic and acidic drinks.

The prevalence of abrasion and attrition was more in the patients more than 60yrs of age followed by the patients in the age group of 15-30 yrs. Erosion was found to be more in patients among the age group of 20-30yrs followed by those who belong to 45-60yrs age group. These results are also similar to the studies done by Bartlett et al,[8]Hina ahmed et al and Bader et al which showed the prevalence of tooth wear to be more with increasing age. Bartlett et al concluded that the increase in prevalence of tooth wear with increasing age could be due to a cumulative effect duration of etiological factors overtime which resulted in increased severity and tooth surface loss.

The abrasion lesions could be due to the combined effect of the type of bristles used, the frequency of brushing and the hand used for brushing. There was no significant association between attrition, erosion with the type of bristles used, frequency of brushing and the hand used for brushing.

This study showed increased prevalence of abrasion (52.1%), attrition (51.4%) and erosion (2.7%) in patients consuming mixed diet than those consuming vegetarian diet. This is in accordance with studies conducted by Bader et al. and Hegde et al[4].

In this study, attrition was significantly high in patients with para functional habits (18.1%) and with opposing prosthesis (39.4%). The para functional habits and opposing prosthesis, mainly due to the high occlusal forces lead to occlusal tooth wear like attrition.

The alcohol consumption, regularity of acidic food intake and intrinsic factors were associated with erosion of teeth. Though not a significant correlation, erosion was found to be present in patients consuming alcohol (4.0%). Consumption of acidic food every fortnight (5.9%) and intrinsic factors (9.7%) were significantly associated with erosion. This could be due to the acid regurgitation from the stomach which could cause the

erosive effect on the tooth surface. This association is in accordance with studies conducted by Bader k et al and Bartlett et al.[10]

REFERENCES

[1] Winters JC. Government of Western Australia department of health, dental health services. Dental Health Education Unit; 2008.

[2] Grippo JO, Abfraction- a new classification of hard tissue lesions of teeth. J Esthet Dent. 1991

[3] Dodhiya Sonal S., Hegde Mithra Nidarsh, yelapure mahalaxmi, Prevalence of non carious lesions in south canara population: A cross sectional study J harm Sci innov, 2014

[4] Hegde MN. Prevalence of Tooth Wear Due to Dietary Factors in South Canara Population.

[5] Bartlett DW, Fares J, shirodaria S, chia K, Ahmad N, Sherriff M. The association of tooth wear, diet and dietary habits in adult aged 18-30 years. Journal of Dentistry.

[6] Bader k Al Zarea, ace loss and associated risk factor in Northern Saudi Arabia- Research article ISRN Dent 2012; 2012: 161565

[7] Addy M, Shellis RP. Interaction between attrition, abrasion and erosion in tooth wear. InDental Erosion 2006 (Vol. 20, pp. 17-31). Karger Publishers.

[8] Barbour ME, Rees GD. The role of erosion, abrasion and attrition in tooth wear. The Journal of clinical dentistry. 2006;17(4):88-93.

[9] Zero DT. Etiology of dental erosion–extrinsic factors. European journal of oral sciences. 1996 Apr 1;104(2):162-77.

[10] Bartlett DW, Fares J, shirodaria S, chia K, Ahmad N, Sherriff M. The association of tooth wear, diet and dietary habits in adult aged 18-30 years. Journal of Dentistry. 2011;811-816.