PREVALENCE OF TOOTH WEAR IN SOUTH WEST COASTAL POPULATION OF INDIA

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ABSTRACT:

The aim of the study was to evaluate the prevalence of tooth wear in south west coastal population of India and factors responsible for tooth wear. 2000 patients were evaluated using diagnostic instruments for the presence of attrition, abrasion, erosion and abfraction, followed by questionnaire, to evaluate the most common factors associated with these lesions in Southern coastal population. The prevalence of tooth wear in the study population is 59.2% out of which attrition(20.8%), abrasion(25.9%), erosion(4.5%) and abfraction(8.0%) respectively and was more prevalent in elderly age group(>65). Increased tooth wear was observed in male population(66.4%). Right handed patients had maximum abrasive lesion. Non-vegetarians showed increased tooth wear.

Keywords: Attrition, abrasion, erosion and abfraction

INTRODUCTION:

Tooth wear also known as Non-carious lesion is a multifactorial pathological condition of the tooth which leads to the loss of Enamel and Dentine[1] . It is an irreversible, destructive, non carious process, which results in a loss of tooth surface, mainly due to acids in our diet, grinding of teeth, regurgitation of stomach acids and lifestyle factors. Over a period of time the loss of enamel can eventually effect the appearance, function and can also cause sensitivity of the tooth structure [2] .

Tooth wear can be broadly categorized into the mechanical and chemical wear. Mechanical wear includes attrition, abrasion and chemical wear include erosion. Attrition is defined as wearing of tooth substance as a result of tooth to tooth contact during normal or para functional masticatory activity. Abrasion is the pathological wear of tooth substance through frictional processes, e.g. tooth brushing. Erosion is the loss of dental hard tissue by chemical action which do not involve bacteria. It is further classified into intrinsic which is due to acid reflex from the stomach and extrinsic due to acids from the dietary components like carbonated soft drinks, fruit juices etc[3].The word ‘‘abfraction’’ was derived from the Latin ‘‘to break away’’. It is the pathologic loss of tooth substance caused by flexure of the tooth which leads to fatigue of the enamel and dentine at a location away from the point of loading[4].

Non –carious lesions presents itself in variety of forms .They can be wedge–shaped, disc-shaped, flattened, irregular areas that vary in size and shape. Studies have shown that cervical wear lesion is often situated on the vestibular surface of tooth and rarely on the proximal surface of the tooth[5].They are more on cuspids and bicuspids and are prevalent in maxilla than in mandible.

Various studies have been conducted with regard to tooth wear and their cause. They have shown significant variances in relation to age, gender, sex, dietary intake and the pattern of tooth wear in different geographical locations. Current study was carried out to investigate the prevalence of tooth wear in South west coastal population of India.

MATERIALS AND METHOD:

The current study was conducted among 2000 subjects in a duration of six months in the year 2015. 1,190 subjects were randomly selected from the Outpatient Department of Conservative Dentistry and Endodontics and 810 from 5 Rural Satellite Centres of A. B. Shetty Memorial Institute of Dental Sciences, Deralakatte Mangalore, India with 1,081 males and 919 females. Tooth wear was assessed using a questionnaire based on WHO oral health survey[6].

After obtaining Ethics clearance from the institutional ethics committee, Written consent of the patient was obtained and all the examination was carried by a single clinician on the dental chair under good illumination and sterile diagnostic instruments . Each tooth was examined for the presence of attrition abrasion, erosion and abfraction according to clinical appearance[7].

Inclusion criteria

- Subjects in age group of 15 years and above
- Patients who are not physically or mentally challenged.

Exclusion criteria

- Subjects with edentulous arch
- Subjects undergoing orthodontic treatment

STATISTICAL ANALYSIS:

Data obtained was statistically analyzed using SPSS version 20.The results were subjected to statistical analysis using pearsons chi-square test to determine the p value of each criteria and the p value <0.05 was considered to be statistically significant.

RESULTS:

Table 1 : Prevalence of tooth wear in different age groups

Age		Attrition	Abrasion	Erosion	Abfraction
15-25 Years	Count	26	35	18	5
	% within AGE	9.8%	13.3%	6.8%	1.9%
26-35 years	Count	45	56	30	42
	% within AGE	10.6%	13.2%	7.1%	9.9%
36-45 years	Count	63	102	15	41
	% within AGE	12.4%	20.0%	2.9%	8.1%
46-55 Years	Count	48	104	3	30
	% within AGE	15.1%	32.8%	0.9%	9.5%
56-65 years	Count	129	159	12	30
	% within AGE	41.9%	51.6%	3.9%	9.7%
65+ years	Count	105	62	11	11
	% within AGE	59.0%	34.8%	6.2%	6.2%
P- value		.000	.000	.000	0.002

P< 0.05 statistically significant

P> 0.05 Non significant

Table 2 : Prevalence of tooth wear in relation to gender

		Attrition	Abrasion	Erosion	Abfraction
Male	Count	259	317	45	84
	% within Gender	24.0%	29.3%	4.9%	8.2%
Female	% within Gender	157	201	44	75
	% within Gender	17.1%	21.9%	4.1%	7.8%
P- value		.000	.000	0.372	0.748

P< 0.05 statistically significant

P> 0.05 Non significant

Table 3 : Prevalence of tooth wear among people with different dietary habits

		Attrition	Abrasion	Erosion	Abfraction	Total
Veg	Count	73	79	14	26	192
	% within Dietary habits	19.7%	21.4%	3.8%	7.0%	51.9%
Non Veg	Count	669	439	400	133	1641
	% within Dietary habits	35.0%	23.0%	20.6%	8.2%	86.8%
P- value		0.04	0.027	0.04	0.467	

P< 0.05 statistically significant

P> 0.05 Non significant

Table 4 : Prevalence of tooth wear in relation to urban and rural areas

		Attrition	Abrasion	Erosion	Abfraction
Rural	Count	216	301	60	95
	% within Location	17.4%	24.3%	4.8%	7.7%
Urban	Count	200	217	59	64
	% within Location	26.2%	28.5%	7.7%	8.4%
Total	Count	416	518	119	159
	% within Location	20.8%	25.9%	6.0%	8.0%
P- value		0	0.039	0.04	0.56

P< 0.05 statistically significant

P> 0.05 Non significant

Table 5 : Prevalence of attrition among Pan chewers

			Attrition		Total
			Yes	No	
Pan chewers	Yes	Count	132	345	477
		% within Pan Chewers	27.7%	72.3%	100.0%
	No	Count	284	1239	1523
		% within Pan Chewers	18.6%	81.4%	100.0%
Total		Count	416	1584	2000
		% within Pan Chewers	20.8%	79.2%	100.0%
P- value			0.00		

P< 0.05 statistically significant

P> 0.05 Non significant

Table 6 : Influence of hand used for brushing

			Abrasion		
			Yes	No	Total
Hand Used For Brushing	Right	count	482	1386	1868
		% within hand used for brushing	25.8%	74.2%	100.0%
	Left	count	26	106	132
		% within hand used for brushing	19.7%	80.3%	100.0%
Total		count	508	1492	2000
		% within hand used for brushing	25.4%	74.6%	100.0%
P- value			0.03		

P< 0.05 statistically significant

P> 0.05 Non significant

Table 7 : Influence of Brushing technique over abrasion

			Abrasion		Total
			Yes	No	
Brushing Method	Horizontal	Count	472	877	1349
		% within Brushing method	35.0%	65.0%	100.0%
	Vertical	Count	101	340	441
		% within Brushing method	23.0%	77.0%	100.0%
	Others	Count	29	181	210
		% within Brushing method	13.8%	86.2%	100.0%
Total		Count	518	1482	2000
		% within Brushing method	25.9%	74.1%	100.0%
P- value			0.00		

P< 0.05 statistically significant

P> 0.05 Non significant

DISCUSSION:

The current study was based on the results of questionnaire and clinical examination and overall prevalence of tooth wear was found to be 59.2% where increased tooth wear was found in the age group above 65 years of age. Attrition was found to be common in elderly population(59%),abrasion more in age group of 56-65 years (51.6%),erosion and abfraction more in 26-35 years (7.1%, 9.9%) [Table 1].Our findings is in accordance with the study conducted by Hegde et al. in 2014 where the prevalence of tooth wear in Dakshina kannada population was significantly higher in older generation(57.40%) . Similar results were found in a study conducted in United kingdom by Bartlett et al in 2011 ,Hina Ahmed et al. in Pakistan 2009, Bader et al[8-10] northern Saudi Arabia in 2012 where the prevalence of tooth wear increases with

age. The increase in tooth wear with age is due to the accumulation of etiological factors which results in increased severity and tooth surface loss overtime.

In the present study there was a statistical significant increase in tooth wear in males compared to females. 705 males (66.4)% and 477 females (50.9%) [Table 2] showed tooth wear which includes attrition, abrasion, erosion, abfraction .This is justified in a study conducted by Bader K et al which showed similar results were prevalence of tooth wear was found to be more in males than in female participants. This could be due to use of heavy masticatory forces in males moreover females care more about their oral health, thus allowing early detection of the disease[11].

The current study showed increased tooth wear in Non- vegetarians compared to vegetarians. Non-vegetarians showed 86.8% tooth wear in study group [Table 3] which is justified in studies conducted by Hedge et al.[12] in same geographical location and Bader K et al.[11] in Soudi Arabia were tooth wear is more in subjects consuming non vegetarian diet compared to vegetarians. This was contradicted by Bartlett et al.[8] who conducted a study in 2011 which showed no correlation between tooth wear and dietary intake. Another study conducted by Sherfudhin H et al[13] in 1996 concluded that vegetarians had a significantly higher degree of tooth wear than the Non-vegetarians .

The prevalence of tooth wear was statistically significant in urban population where attrition is 26.2% , abrasion is 28.5%,erosion 7.7 and abfraction 8.4% [Table 4] of the total sample size.

Our study showed a significant association between attrition and Pan chewing [Table 5]. Out of 477subjects who reported to chew pan, 27.7% had attrition and 18.6% of the subjects had attrition which was not associated with pan chewing. This was not in accordance with the study conducted by Durre sadaf et al[15] in the year 2009 in Karachi which found no significant difference between tooth wear and pan chewing. This could be due to type of paan chewed in India contains arecanut which is raw and hard and cause loss of tooth surface.

The current study found a significant correlation between brushing technique and abrasion. Majority of participants with abrasive lesions were right handed (25.8%) and most commonly affected quadrants were upper quadrants [Table 6].

One of the major cause of abrasive tooth wear is faulty brushing technique. Our study showed a statistical significant correlation between horizontal method of brushing and tooth wear which contributed to 35.0% of the total abrasion [Table 7]. Our results are similar to John J.Dzakovich[16] which showed use of tooth paste along with horizontal brushing method was capable of tooth loss at cervical areas. Another study undertaken by Hedge at al.[17] in 2014 concluded that main etiologic factor for abrasion lesion was method of brushing and the brushing hand which is in agreement with study conducted by Radents WH at al. which showed tooth brush abrasion is strongly suspected for contributing majority of wedge shaped lesions[18].

CONCLUSION:

Within the limitation of the present study it can be concluded that tooth wear was found to be more in males and mostly affected elderly age groups. Incidence of tooth wear is found to be more in subjects who consumed non vegetarian diet, alcohol and pan chewers. Excessive brushing and the use of hard tooth brush have strong association with tooth wear.

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