Afr. J. Med. Med. Sci. (2022) **52(4) 199 - 208,**

Pattern and associated factors of tooth wear lesions in adolescents and adult population in Ibadan, Southwestern Nigeria

DM Ajayi and AO Oyediran
Department of Restorative Dentistry, College of Medicine, University of Ibadan, Ibadan, Nigeria.

Abstract
*Background***:** Tooth wear is perceived internationally as an ever-increasing problem associated with loss of tooth tissue by disease process other than dental caries. The purpose of this study was to provide data on the prevalence and pattern of tooth wear lesions in adult patients seen at a Government Dental Centre, Ibadan, Oyo State, Nigeria. Too short (just two sentences)
*Materials and methods***:** This study was conducted using a descriptive cross sectional design. Consecutive patients who attended the Oral Diagnosis Clinic of the Government Dental Centre, Dugbe, Ibadan were recruited into the study. A structured questionnaire was administered to obtain information from each participant. The severity of tooth wear was assessed using the Smith and Knight Tooth Wear Index (TWI). Data were analyzed using IBM, Statistical Package for Social Sciences version 23. Frequencies and percentages of relevant variables were noted while Chi-square test was used to test associations between categorical variables at 5 % level of significance.
Results: The prevalence of tooth wear lesion among the study population was 95.6%. Approximately 58% had a combination of all the lesions, attrition was found in 31% of the teeth. There was an association between tooth wear lesions and regurgitation of gastric content, consumption of acidic drinks and beverages, eating of hard food substances. There was also an association between high bite force coming from habit such as crushing or biting bones. These associations were, however, not statistically significant. The mandibular teeth were more commonly affected than maxillary teeth, with the incisors having the highest form of tooth wear than the molars and premolars.
Conclusion: The prevalence of tooth wear was very high among the studied population The mandibular incisors were the most frequently affected tooth type followed by the molars with the incisal/occlusal surface being the most commonly involved.

Keywords: *Adult population, Prevalence, Southwestern Nigeria, Tooth wear lesions*

Correspondence: Dr. A.O. Oyediran, Department of Restorative Dentistry, College of Medicine, University of Ibadan, Ibadan, Nigeria. E-mail:asidarimi@gmail.com.

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Introduction

Tooth wear refers to the loss of tooth tissue by a disease process other than dental caries [1]. The lesions are caused by attrition, abrasion, erosion and abfraction. Cases of the lesion usually involve combination of these factors, thus the condition has been said to be multifactorial in origin leading to loss of enamel and dentine. Internationally, this disease is an ever increasing problem likely to continue as more natural teeth are retained to old age [1]. When external or internal factors such as diet, medication, appliances, oral hygiene habits and regurgitation of gastric content are present, normal physiologic wear becomes far more advanced and affects the oral cavity to a greater extent.

Dental erosion is the dissolution of dental hard tissues by acids which could be dietary(extrinsic) or gastric(intrinsic) while abrasion is the wearing off of dental hard tissues via a mechanical process involving foreign objects [2]. Attrition is the loss of dental hard tissues resulting from tooth to tooth contact without any foreign substance intervention.Ref Abfraction on the other hand result from shear stress at the cemento-enamel junction that results into tooth flexure, causing tiny fractures in enamel and dentine. This type of loss of tooth substance is usually seen as wedge-shaped cervical lesions [2].

The clinical features of erosion include presence of wear on non-occluding surfaces [2]. There may also be a progression of existing cervical lesions with cupping and/or grooving of the occlusal surfaces. The affected surfaces appear smooth and highly polished with scooped-out depressions. The tooth may appear translucent due to the general thinning of the enamel. If the dentine is exposed, it will be associated with increased sensitivity or pain. Abrasion is characterized by the presence of worn down, shiny, often yellow/brown areas at the cervical margin of teeth. There may be worn 'notches' on the incisal or occlusal surfaces of the anterior and posterior teeth. Attrition is seen as facets (flat surface with circumscribed and well defined border), with opposing tooth facets matching perfectly in occlusion while abfraction is seen as wedge shaped lesions with sharp angles at the cervical margins of teeth.

Tooth wear lesions, if left untreated or unattended to, may progress to dentinal exposure and eventual pulpal exposure. This exposure leads to insult on the dentine and pulp resulting in dentinal hypersensitivity and pulpitis respectively. A common symptom is sharp excruciating pain which is aggravated by air, touch and cold stimulus eventually affecting the quality of life of the affected patients [3].

The prevalence of tooth wear lesions is variable, and studies have shown that it varies according to age, gender, occupational groups, geographic areas, and cultures [4-7]. In a Chinese survey where erosion was assessed using 5–15-year-old children, its prevalence ranged from 7 to 60%. This wide prevalence was said to be as a result of the different socioeconomic levels, populations, ages used in their study. They also reported that abrasion was commoner in the 60–74-year-old population and that attrition was primarily a physiological wear [7]. Al-Azawi *et al,* reported a 100% prevalence of tooth wear lesions in a study conducted among 50-89 year old institutionalized residents [8].

–In Nigeria, Taiwo *et. al*. [4] reported a prevalence of 92.8% among the elderly. Oginni and Olushile in 20029??? reported a prevalence of 14.4% among adults 16years and above, while Ogunyinka *et. al* observed a prevalence of 8.5% among teenagers [10]. ~~The disparity in the prevalence may be associated with the age group of the population studied.~~(there is no need to give a reason for the disparity because this not a discussion section)
It is quite apparent from literature that tooth wear lesions have become common., thus the need to periodically evaluate the pattern of the condition in different populations. This assessment will help provide an appropriate understanding of the condition and recommendation on preventive measures based on the causative factors. This study aimed to assess the prevalence and pattern of tooth wear lesions in adolescents and adult patients seen at the Government Dental Centre, Ibadan, Oyo State, Nigeria.

Materials and methods

This study was a descriptive cross sectional study conducted at the oral diagnosis clinic of the Government Dental Centre Dugbe, Ibadan, Nigeria. 250 consecutive patients aged between 16-75years who were willing to participate were recruited into the study. Willingness to participate was shown by the signing of an informed consent form. (how did you arrive at the 250? Inclusion and exclusion criteria should come up here)

A structured interviewer-administered questionnaire (was the questionnaire pre tested?) was used for the

data collection. The questionnaire contained demographic data which included age, gender, marital status, educational background and occupation. Information on medical and dental histories relating to tooth wear was also collected. This included history of diabetes mellitus, gastroesophageal reflux disease, asthma, bulimia nervosa, drug use, bruxism, heartburn and xerostomia.

An oral examination of all participants was done by the principal investigator (OAO) who had earlier been well trained by an experienced specialist (AMD) and calibrated in the assessment of tooth wear lesions using the Smith and Knight (1984) tooth wear index (TWI). Calibration of the principal investigator (PI) was done using clinical photographs obtained from previous studies [11]??? and ~~pretesting~~ (more like calculating intra examiner realiability. What is the percentage?) was done by assessment of 10 patients who were not part of the study prior to the commencement of the study.

Each participant was seated on a dental chair and evaluation of the teeth was done by the principal investigator, observing appropriate infection control protocol, using primary barrier method with adequate use of disposable materials.

Tooth wear lesions were assessed on the cervical, buccal, lingual, and occluso–incisal surfaces of the mandibular teeth and cervical, buccal, palatal, and occluso–incisal surfaces of the maxillary teeth using the TWI used in calibrating the PI.

Inclusion criteria were: all dentate patients older than 16 years old that presented at the Dugbe Dental Centre during the study period and those that consented to the study while the exclusion criteria were patients less than 16~~yrs~~ years and those not willing to participate in the study. In addition, all teeth with evidence of restorations, enamel or dentine fracture or caries were excluded.

Ethical clearance was obtained from the University of Ibadan/University College Hospital Health Research Ethics Committee (UI/UCH HREC). Ref No UI/EC/13/0392

Data analysis was done using SPSS Statistical Software for Windows, version 23. Results were presented using frequency tables and charts. Strength of association between categorical variables was tested using Chi-square test. Test of significance was set at P-value <0.05

Results

All the questionnaires administered were retrieved and found usable giving a response rate of 100% of the 250 participants, 125 (50%) were males and 125 (50%) were females coincidentally. The age of the participants ranged from 16 to 75 years with a mean of 47.5(±1.44) years. The majority of the participants were Yoruba (91.6%) tribe and Christian (70.4%). The level of education in the study population cut across all the different groups ranging from none (12 %), primary (16 %), secondary (22 %) post-secondary not university (21 %) and HND/University group which had the highest proportion of 27 %. (Table 1).

Table 1. Relationship between tooth wear lesion and demographic characteristics

Variable	Tooth Lesion	
	Present	Absent
Age group (Years)	n (%)	n (%)
<20	9(3.8)	0(0)
21-40	63(26.4)	5(45.5)
41-60	119(49.8)	5(45.5)
>60	48(20.1)	1(9)
Sex		
Male	118(49.4)	7(63.6)
Female	121(50.6)	4(36.4)
Tribe		
Yoruba	220(92.1)	9(81.8)
Others	19(7.9)	2(18.2)
Occupation		
Traders	83(34.7)	2(18.2)
Civil servants	52(21.8)	3(27.3)
Students	24(10.0)	2(18.2)
Retirees	32(13.4)	3(27.3)
Others	48(20.1)	1(9.0)
Marital Status		
Married	164(68.6)	6(54.5)
Single	43(18.0)	3(27.3)
Separated/Divorced/ Widowed	32(13.4)	2(18.2)
Religion		
Islam	74(31.0)	0(0.0)
Christianity	165(69.0)	11(100)
Level of education		
None	30(12.5)	0(0.0)
Primary	39(16.3)	2(18.2)
Secondary	53(22.2)	2(18.2)
Post-Secondary not University	52(21.8)	1(9.1)
HND/University	65(27.2)	6(54.5)
Total	239(95.6%)	11(4.4%)

None of the medical conditions had a statistically significant relationship with presence of tooth wear lesions. However, all the 5 patients with asthma, the 4 patients with gastro esophageal reflux disease and the 11 patients with dry mouth had tooth

wear lesions. A high majority of those that had mouth odour (94.9 %), suffered from diabetes mellitus (91.7 %), and those that had heartburn (96.3 %) had tooth wear lesions. Furthermore, there was also high presence of tooth wear lesions among those with caffeine addiction and those that had the habit of chewing vitamin C/aspirin (Table 2).

Table 2. Distribution of tooth wear lesions and medical/ drug history of patients.

	TWLs Present (%)	TWLs Absent (%)
Regurgitation	14(93.3)	1(6.7)
Asthma	5(100)	0(0)
Diabettes	11(91.7)	1(8.3)
Gastroesophageal Reflux Disease	4(100)	0(0)
Dry Mouth	11(100)	0(0)
Mouth Odour	37(94.9)	9(4.3)
Hearth Burn	26(96.3)	1(3.7)
Caffeine Addiction	9(90)	1(10)
Chew Vit C/Aspirin	68(97.1)	2(2.9)
On Medication	70(89.7)	8(10.3)

Table 3. Tooth wear lesion and associated aetiological factors

Tooth wear pattern and associated etiological factors	Frequency (%)	p-value
Attrition(n=74)		
Tooth grinding		
•Yes	2(2.7)	
•No	72(97.3)	0.444
Jaw muscle pain		
•Yes	3(4.1)	
•No	71(95.9)	0.495
Stress		
•Always	5(6.7)	
•Very often	10(13.5)	
•Sometimes	19(25.7)	
•Rarely	21(28.4)	
•Never	19(25.7)	0.017
Abrasion(n=11)		
Type of bristle brush used		
•Extra hard	1(9)	
•Hard	2(18.2)	
•Medium	4(36.4)	
•Soft	4(36.4)	0.425
Brushing force		
•Gently	5(45.5)	
•Vigorously	6(54.5)	
Cleaning type		
•Brush	9(81.8)	
•Chewing stick	0(0)	
•Brush and chewing stick	2(18.2)	0.597
Bite on objects like corks, pins etc		
•Always	0(0)	
•Very often	0(0)	
•Sometimes	2(18.2)	
•Rarely	1(9.1)	0.001
•Never	8(18.2)	
Chew hard food substance		
•Always	1(9,1)	
•Very often	1(9.1)	
•Sometimes	6(54.5)	
•Rarely	3(27.3)	
•Never	0(0)	0.408
Tooth picking		
•Always	3(27.3)	
•Very often	4(36.4)	
•Sometimes	3(27.3)	
•Rarely	1(9)	0.872
•Never	0(0)	
•Yes	1(9)	
•No	10(91)	0.695
Difficult stains		
•Yes	2(18.2)	
•No	9(81.8)	0.238
Mouth odour		
•Yes	5(45.5)	
•No	6(54.5)	0.005
Erosion(n=16)		
Regurgitation		
•Yes	2(12.5)	
•No	14(87.5)	0.001
Chew Vitamin C or Aspirin		
•Yes	10(62.5)	
•No	6(37.5)	0.002
Soft drinks directly from bottle		
•Always	2(12.5)	
•Very often	1(6.25)	
•Sometimes	8(50.0)	0.805
•Rarely	4(25.0)	
•Never	1(6.5)	
Rinse mouth after drinks or fruits		
•Yes	3(18.8)	
•No	13(81.2	
Intake of wine or alcohol		
•Always	0(0)	
•Very often	0(0)	
•Sometimes	7(43.75)	0.888
•Rarely	5(31.25)	
•Never	4(25.0)	
Swish drink round mouth		
•Always	0(0)	
•Very often	0(0)	
•Sometimes	5(31.25)	0.707
•Rarely	7(43.75)	
•Never	4(25.0)	

Two hundred and thirty-nine (239) patients representing 95.6 % of the study population had different forms of tooth wear lesions (Table 1). It was observed that seventy-four (31 %) of the patients with tooth wear lesions had attrition, 4.6 % had abrasion; 6.7 % had erosion while 57.7 % had different combinations of the lesions. (Table 4).

Table 4: Distributions of tooth wear lesions among participants

Tooth wear pattern	Frequency n (%)
Attrition	74(31)
Abrasion	11(4.6)
Erosion	16(6.7)
Combined:	138(57.7)
Attrition and abrasion	42(30.4)
Attrition and erosion	33(24)
Abrasion and erosion	7(5)
Attrition, abrasion and erosion	56(40.6)

Combined lesion was found to be the most common form of tooth wear lesion being 57.7% out of which (Attrition and abrasion 30.4%, Attrition and erosion 24%, Abrasion and erosion 5%.

A total of 7,497 teeth and 35,810 surfaces were examined for the presence and severity of tooth wear lesion using the Smith and Knight (1984) tooth wear index. Out of 7,497 teeth examined 7,162 teeth had tooth wear lesions giving a prevalence of tooth lesion of be 95.5%.

Out of the 35,810 surfaces, examined 30,570 surfaces (85.4%) had no tooth wear lesion while 5240(14.6%) surfaces had tooth wear lesions. (Table 5).

Table 5: Surface prevalence among patients with tooth wear lesions

	Frequency (%)
Total number of teeth	7162
Tooth surfaces	35810
Tooth surfaces without TW	30570(85.4)
Tooth surface with TW	5240(14.6)

Out of the 5240 surfaces with tooth wear lesions, 3,341 (63.8%) had Smith and Knight Index **1**; 1,642 (31.3 %) had Smith and Knight Index **2**; 233 (4.4 %) had Smith and Knight Index **3** while 24 (0.5 %) surfaces had Smith and Knight Index **4**. (Table 6).

Tooth wear lesions were observed more in the lower jaw than in the upper jaw comprising 51.2 % and 48.8 % respectively. The incisors had the highest prevalence of tooth wear lesion of 34.2 %, closely followed by the molars (32.5 %), the premolars (20.7%) and canines (12.5%). (Table 7). The most prevalent surface with tooth wear lesion was the incisal/occlusal surface with 3450 surfaces (65.8 %) affected. This was followed by 1400 buccal surfaces (26.7 %), 286 lingual surfaces (5.5 %) and 104 interproximal surfaces (2.0 %) of the total surfaces with tooth wear lesions. (Table 8).

Table 6: Smith and Knight Scores among patients with tooth wear

Smith and Knight Score	
-Score 1	3341(63.8)
-Score 2	1642(31.3)
-Score 3	233(4.4)
-Score 4	24(0.5)

Discussion

Tooth wear, a complex biological process of hard dental tissue loss can affect the function of chewing and speaking significantly. It may also result in tooth sensitivity and pain. The most common complaints that make patients present at the clinic are acute or chronic pain or hypersensitivity to changes in temperature, pressure and chemical stimuli [12]. It is important to recognize the fact that the etiology of tooth wear is multifactorial and failure to do this may lead to unsuccessful restorative care [13].

In this study, the prevalence of tooth wear lesion was found to be 95.6% in the study participants aged 16-75years. This prevalence is similar to that by Taiwo *et al* [4] who reported an equally high prevalence of 92.8% though their study was conducted amongst elderly individuals, aged 65 years and above. Similarly, a high prevalence of 100% was reported by Al-Azawi *et al* [8] and Saerah *et al* [6] though the study populations were different. Al-Azawi *et al* [8] studied tooth wear lesions in institutionalized individuals aged 50-89 years [8] while Saereh *et al* [6] studied tooth wear lesion in 16-year- old secondary school children [6]. It can, therefore, be inferred that tooth wear lesions may not only be limited to adults or the elderly, but may also affect children and teenagers. Clinical observations have shown some evidence of tooth wears on newly erupted permanent molars. [14] These tooth wears may be diet or habit related.

However, in contrast to this, Oginni and Olushile [9] recorded a prevalence of 14.4% in 16year old patients and above [9] while Ogunyinka

Table 7. Distribution of tooth wear lesion based on tooth type

	Molars No. (%)	Premolars No. (%)	Canines No. (%)	Incisors No. (%)	Total No. (%)
Upper	813(15.5)	548(10.4)	325(6.2)	874(16.7)	2560(48.8)
Lower	892(17.1)	538(10.3)	330(6.3)	920(17.5)	2680(51.2)
Total	1705(32.5)	1086(20.7)	655(12.5)	1794(34.2)	5240(100)

Table 8. Distribution of tooth wear lesion based on tooth surfaces

	Buccal No. (%)	Lingual No. (%)	Occlusal/incisal No. (%)	Interproximal No. (%)	Total No. (%)
Upper	829(15.8)	129(2.5)	1553(29.6)	49(0.9)	2560(48.8)
Lower	571(10.9)	157(3.0)	1897(36.2)	55(1.1)	2680(51.2)
Total	1400(26.7)	286(5.5)	3450(65.8)	104(2.0)	5240(100)

Fig. 4.1: Clinical picture of a respondent with tooth wear lesion (Attrition)

Fig. 4.2: Clinical pictue of a respondent with tooth wear lesion (Cervical abrasion)

Fig. 4.3: Clinical picture of a respondent with tooth wear lesion (Erosion and cervical abrasion)

et al [10] reported a prevalence of 8.5% among teenagers [10]. The higher prevalence in this study may be due to several aetiological factors contributing to the different tooth wear lesions as mentioned.

The mean age of the participants in this study was 47.54±1.44 years which is lower than the mean age of 69.7±6.2 years studied by Taiwo *et al* [4] and higher than that reported by Ibiyemi *et al* (35.6 ±11.7years).[15]

The difference in mean age may be associated with the difference in the population studied. Though these different studies recorded varying prevalence, they are all in agreement that tooth wear is a cumulative process, with increasing prevalence as age increases. Many studies [4,6,16]

concluded that tooth wear involves a cumulative process occurring throughout life and was an age-related phenomenon; but severe tooth wear could happen during any period of life [17]. Many authors [7,18,19] reported that severe level of wear could be observed in any age group. The increased teeth exposure to environmental factors (local or systemic, erosive, attritive or abrasive factors) may have greater influence on development of tooth wear than age.

Attrition has been reported to be more important than erosion in the aetiology of tooth wear among Nigerians. [4,9,15,20] This trend was observed in this study where about one-third (31%) of the participants had attrition. This is more likely due to rigorous mastication of the more fibrous Nigerian diet. Daly R Wirdatul [16] also recorded a prevalence of attrition of 30.9% though the study had abrasion as having the highest prevalence. This finding is, however, different from what was reported in the United Kingdom [21] where erosion was a major cause of tooth wear. This disparity may be associated with difference in aetiological factors contributing to tooth wear.

Taiwo *et al* [4] in their study reported common habit of crushing bone and hard food substances as well as the use of chewing sticks for daily routine oral hygiene care as major contributing factors to the development of tooth wear lesions. These habits and practice may also play a major role in tooth wear lesions seen in this study participants since only ten patients had a positive history of bruxism (parafunctional habit) which is a significant aetiological factor of attrition. It should be noted that, in the process of chewing hard food substances, it is not unlikely that the surfaces of teeth grind against one another thus resulting in attrition. This grinding habit might also be due to stress as reported by Pavone [22] who indicated that abnormal clenching and grinding habits produced unusual wear patterns of occlusal surfaces. Similarly, Carvalho *et al* [23] associated bruxism with emotional stress which may or may not be due to daily activities of the respondents. In addition, Xhonga[24] showed that people who displayed such parafunctional habits could experience up to four times more tooth wear than those without this habit.

Erosion was the second, most important, single cause of tooth wear in this study accounting for 6.7% of tooth wear lesions.Lussi [25] reported a higher prevalence of erosion (16%) in a Swiss population while Oginni and Olusile [9], Daly R Wirdatul R [16] and Ibiyemi [15] reported a prevalence of 1.3%, 1.2% and 10.4% respectively. In this study, regurgitation of gastric contents, the consumption of alcohol and acidic drinks, chewing of vitamin C and aspirin, ingestion of drinks directly from bottle and swishing of the drinks and direct sucking of citrus fruits without rinsing mouth after were all investigated. Although, regurgitation was an uncommon practice among the present study group, a statistically significant relationship was observed between regurgitation of gastric content, chewing of vitamin C, aspirin and tooth wear lesion.

Oginni *et al* [26] reported significant association between regurgitation and dental erosion in Nigerian patients [9]. All these significant relationships were not unexpected since acidic solution or substances cause demineralization of dental hard tissues thus resulting in erosion. There is a considerable body of evidence from laboratory studies that indicates that low pH acidic foods and drinks cause erosion of enamel and dentine. [27]

Abrasive lesions alone (4.6%) was observed to be lowest in this study which is different from the trend observed in European countries where erosion rather than attrition and abrasion was found to be the major cause of tooth wear [18,21] Oginni *et al* [26] reported abrasion as the second most important cause of tooth wear lesion, accounting for 19.4% of the worn surfaces. The low prevalence of abrasion in this study may be connected to the fact that the majority of the participants in this study claimed to be using medium bristled brushes as opposed to the hard and extra hard bristled brushes. Hard and extra hard bristles are known to cause increase rate of tooth-wear. In addition, the toothpaste used by the participants may not have contained a very high amount of abrasive to cause abrasion. Other authors [28,29] have also reported that the type of toothbrush used, frequency of brushing and force of brushing were found to be related to tooth wear. It was also observed in this study that the number of times of cleaning is related to increasing tooth wear.

The multifactorial aetiology of tooth wear was further supported by this study from the observation that combined factors had the highest frequency of 57.7%. This pattern differs from observation in the study done by Oginni and Olushile [9] where combined lesions were reported to be 24.9% while in the Malaysian population [9] the prevalence of 32.1% was found for the combined lesion. It has been pointed out by Lintojua [30] that differentiation among attrition, abrasion and erosion is difficult, since these aetiological factors may act

synchronically or additively with other entities masking the true nature of tooth wear.

This study found that 14.6% of tooth surfaces were affected by tooth wear. It was further observed that most of the wear only occurred in enamel (63.8%) ,35.8% had involvement in shallow and deeper dentine and the most severe form of toothwear involving the pulp were found in only 0.5% of the participants.

In contrast, Daly R Wirdatul R [16] did not find any form of severe tooth wear lesion in their study while Saerah *et. al* [6] reported a prevalence of 0.7%. The majority of tooth wear lesions in this study were the mild form (confined to the enamel) and this could explain the absence of tooth sensitivity in the majority of the participants. In addition to the above, dentinal exposure secondary to tooth wear may not result in tooth sensitivity since the condition may be chronic, thus leading to the deposition of tertiary dentine. Moreover, Bishop [30] in a review article further stated that despite exposure of extensive areas of dentine, acute sensitivity is rarely a problem and this might be due to the development of sclerosed dentine and smear layer on the surface of the tooth.

In this study, the mandibular teeth exhibited a higher prevalence of tooth wear than the maxillary teeth. This finding is similar to those of Braimoh and Alade [31], Taiwo *et al*. [4] and Liu *et al*. [32] This result may be attributed to the role of the mandibular teeth during mastication and throughout the process of protrusive guidance. The mandibular teeth provide grinding surface for the coarse and fibrous diet and also receive the masticatory forces generated during mastication.

The incisors had the highest (34.2%) prevalence of tooth wear lesion closely followed by the molars (32.5%),then the premolars(20.7%) and canines (12.5%).The reason for the higher rate of tooth wear lesion in the incisors as projected by Liu *et al*. [32] may include the following : the enamel of the incisors are thinner and the incisors are smaller; secondly, the incisors play an active role in both masticatory and excursive jaw movements during function and parafunction, which may place greater demands upon these teeth than that endured by the larger posterior teeth; and lastly incisors and canines are, on the average, the most frequently retained teeth among older people, which may influence the level of wear to which they are subjected.

The most prevalent surface with tooth wear lesion was the incisal/occlusal surface with 3450 surfaces (65.8%) affected, followed by the buccal 1400 surfaces (26.7%), lingual 286(5.5%) and then the interproximal surfaces with 2.0% of the total surfaces with tooth wear lesions. The type of occlusion observed in respondents showed that the majority of them had *Class 1* relationship both anteriorly and posteriorly.

Conclusions

In conclusion

I. T with combined lesions followed by attrition being the most common form of tooth wear lesions observed.

II. Results from the study suggest that a large percentage of the study population had mild tooth wear with most worn surfaces having Smith and Knight Index Score of **1** relating to loss of enamel characteristics and minimal loss of contour.

III. Regurgitation of gastric content, consumption of acidic drinks and beverages, eating of hard food substances and high chewing force coming from habits such as crushing or biting bones have been identified as the most common causative factors of tooth wear lesions. Tooth wear lesions can be concluded to be caused by multiple aetiology thus causing the high prevalence of combined lesions

IV. The incisors had the highest form of tooth wear followed by the molars, then the premolars and the canines. The mandibular teeth had higher prevalence than maxillary teeth.

Recommendations

The knowledge of aetiology and severity of tooth wear is important for preventing further lesions and aborting the progression of existing lesions. Treatment will be ineffective in the long term if aetiological factors are not eliminated. Early detection of dental tooth wear especially the pathological wear is important for prevention of serious irreversible damage to dentition. Hence concerted efforts must be made to improve awareness and educate the populace about implications of their lifestyle, dietary and social habits, to their overall dental health. Secondly, the practitioners should regularly update their knowledge in the management of tooth wear lesions.

Limitations

Financial constraints were a limitation as impression of the oral cavity would have been made to get the casts which could have been used to assess the severity of tooth wear lesions more objectively as these would have given a better view of the lingual surfaces.

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Received = 28/07/2021
Accepted = 06/04/2022