ORIGINAL ARTICLE

Causative Factors of Tooth Wear among Patients Visiting a Tertiary Care Hospital in Lahore

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ABSTRACT

Background: Tooth wear, or as it is also often referred to as non-carious tooth surface loss (TSL), can be described simply as 'the pathological non-carious loss of tooth tissue'. Tooth wear is often multifactorial in nature, making clinical diagnosis difficult. Identification of the etiology is essential for the successful management of the pathology.

Methods: A total of 120 patients of both male and female with tooth wear were selected from dental OPD. Patients with age group 25-65years with tooth wear in at least two teeth according to basic erosive wear examination (BEWE) were included. Questionnaire covering primary risk factors that might cause tooth wear was used Data was analyzed using SPSS version 24.0.

Results: Out of the 120 tooth wear patients, 69(57%) were male and 51(43%) were females. tooth wear presented more in males as compared to females. 42.24% patients reported with habit of tea consumption and 32.5% with cold drinks. 45% males and 43.4% females had gastric reflex disease. 60.9% male patients had problem of bruxism and clenching.

Conclusion: This study reported that TSL has a multifactorial etiology. Parafunction, gastro esophageal reflux disease (GORD) and consumption of carbonated drinks were the most commonly observed causative factors.

Keywords: Tooth wear, Erosion, Abrasion, Attrition, Causative factor

INTRODUCTION

Tooth wear is irreversible degeneration of dental tissue due to reasons other than bacterial insult[1]. The management of tooth wear needs an extensive knowledge of causative factors and its clinical presentation. Tooth wear can present clinically as attrition, abrasion, abfraction and erosion[2]. Tooth wear may manifest in segregation or in amalgamation with attrition, abrasion, abfraction and erosion[2,3]. Terminology of 'tooth surface loss' is commonly used when it is hard to find single a causative factor. Dental erosion is a condition in which there is loss of hard tooth structure by chemical means, notably intrinsic or extrinsic acids for example gastroesophageal reflux diseases (GERD), high consumption of soft carbonated drinks and citrus or sour food items[4].

Attrition is a pathological loss of tooth structure caused by contact between occluding or proximal surfaces. It may also be an outcome of parafunctional activities i.e., bruxism[5]. Abrasion is a type of mechanical tooth wear predominantly caused by friction of extrinsic agent against the tooth e.g. aggressive use of toothbrush and different biting habits. Abfraction had been introduced by Imfeld as a loss of dental hard tissue at cervical area due to eccentric occlusal loading. This non-carious lesion exists as sharp line angle wedge shape lesion[4,6]. The pattern of tooth surface loss (TSL) facilitates clinician to identify the etiology of tooth wear. Unrestricted tooth surface loss causes periapical periodontitis, pulpitis, pulpal necrosis and hypersensitivity leading to crucial harm to intra oral health[5].

A study carried out in 3 public dental services in Stockholm suggested that erosive tooth wear was diagnosed in notable correlation with frizzy drink consumption, use of juice or energy drinks as a thirst quencher after exercise and tooth hypersensitivity when eating and drinking. Self-assessed gastric reflux was a strong factor associated with TW (p < 0.001)[7]. Another study conducted in Tokyo, Japan revealed that the participants who took pickled foods (p= 0.048), lime (p=0.028), vinegar drinks (p< 0.001), and citrus juices (p=0.003) almost every day had significant tooth wear. The participant who brushed their teeth with soft texture of

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toothbrush showed a significant lower tooth wear (p=0.027)[8]. The study carried out at University of Medicine and Pharmacy of Targu Mures suggested that most popular drinks with tooth wear potential were soft drinks (57%), coffee (58.2%) and tea (24.1%) also bruxism (19%), tooth brushing (12.7%) and acid reflux (12.7%)[1]. The study conducted on adult patients in VSPM 'Dental College and Hospital, India concluded that 55% of the study population had tooth wear due to habit of chewing of tobacco related products (p= 0.0001)[9].

Tooth wear is a common problem, but most often left untreated. The aim of this study is to dig deeper into factors causing TW, leading to a better understanding and preventive measures for the condition in our community.

MATERIALS AND METHODS

After taking approval from the Ethical Review board of the institute, a cross-sectional descriptive study was conducted in the Prosthodontics department at Punjab Dental Hospital, Lahore from September 2021 to March 2022. A total of 120 patients of both genders with tooth wear were selected from dental OPD. Patients with age group 25-65years with tooth wear in at least two teeth according to basic erosive wear examination (BEWE) were included. Tooth wear was diagnosed by assessing all four tooth surfaces using BEWE Index. Therefore, 0 (no wear), 1 (initial loss of surface texture), 2 (<50% TSL) and 3(>50% TSL). Score of 1 and above was considered as positive tooth wear. Patient with periodontal disease, carious teeth, crown and bridge treatment on molar and incisor were excluded from the study. Patient with systemic diseases that lead to xerostomia that might affect the outcome were also not included in the study. Verbal consent was taken from each patient. To avoid bias in this study a standardized measuring tool in the form of interviewer administered questionnaire covering primary risk factors that might cause tooth wear was used. The Performa had demographic details (such as name, age, gender and education) and nine questions about consumption of soft drinks or tea, type of tooth brush, nail or other habitual biting, bruxism or clenching and symptoms of acid reflux or heart burn. Data was analyzed using SPSS version 24.0. Post Stratification Chi-square test was applied by taking P ≤0.05 as significant.

RESULTS

Age range in this study was from 25 to 65 years. Majority of the patients 82(68.34%) were between 46 to 65 years of age as shown in table 1. It shows that tooth wear increase with age. Out of the 120 tooth wear patients, 69(57%) were male and 51(43%) were females. Tooth wear presented more in males as compared to females. This study reports that the association of gender in tooth wear patients with causative factors (Table 2). Among 120 patients, 42.24% patients reported with habit of tea consumption and 32.5% with carbonated drinks. 45% males and 43.4% females had problem of heart burn or acid reflux. However, 60.9% male patients had complaint of parafunctional activities.

Table1: Distribution of patients with tooth wear according to age (n=120)

Age(Years)	Patients tooth wear	Percentage
25-45	38	31.67
46-65	82	68.34
Total	120	100.0

Table 2: Association of gender with etiological factors

Variable	Category	Male	Female	PValue
Consumption Favorite drink	Carbonated	21(30%)	18(35.3%)	
	Coffee	4(5.7%)	2(4%)	0.747
	Tea	42(60.86%)	28(55%)	
	Never	2(2.8%)	3(5.8%)	
Type of tooth brush	Hard	12(17.4%)	7(13.7%)	0.789
	Medium	30(43.5%)	25(50%)	
	Soft	27(40%)	19(37.25%)	
Nail biting	Yes	2(2.89%)	4(7.85%)	0.219
	No	67(97.10%)	47(92.51%)	
Object biting	Yes	1(1.45%)	2(4%)	0.391
	No	68(98.6%)	49(96%)	
Bruxism or Clenching	Yes	42(60.9%)	26(51%)	0.279
	No	27(39.13%)	25(49.01%)	
Acid Reflux/ Heart Burn	Yes	31(45%)	22(43.4%)	0.82
	No	38(55%)	29(56.9%)	

Table 3: BEWE Scores and Criteria.

Score	Criteria
0	**No ETW**
1	Initial loss of surface texture
2	Distinct defect; hard tissue loss involving <50% of the surface area
3	Hard tissue loss involving ≥50% of the surface area

DISCUSSION

Tooth wear was assessed in 120 patients with help of BEWE Index which was introduced by Bartlett, Ganss and Lussi in 2008[10]. It is a simple and authentic index to screen tooth wear in patients (Table 3). Scores of BEWE alters with respect to tooth surfaces irrespective of causative factor and it is applicable for all causes of tooth wear including attrition and abrasion.[11] Majority of the patients 82(68.34%) were between 46 to 65 years of age in our study. Van't Spijker et al found that incidence of tooth wear had raised up to 3% at the age of 20 years and increased17% at 70 years[12]. Age has a definite correlation with TSL severity. Exposure to the risk factors with advancing age lead to more deteriorated condition overtime. This coincide with the outcomes of previous studies in other populations[3]. Oginni et al concluded that prevalence of tooth wear increased with the age of patients[13]. Deshpande S and Meshramkar R et al, also concluded almost same results in their studies[14]. However, various studies revealed young people are more evident with tooth surface loss[15].

In this study out of 120 patients, 69 were male and 51 were female. Another study conducted in Karachi also found tooth wear more prevalent in male population[3]. Female population may have showed more concern about dental treatment and follow regular visits to dentist. So, it leads to an early diagnosis and implementation of preventive measures. Moreover, males have high bite force, so they are more prone to tooth wear than females[16]. Although one study conducted in Saudi Arabia showed that gender has no significant relationship with tooth wear[17].

Parafunctional activities grinding or bruxism is correlated with tooth wear. In our study 42.21% patients have reported in our study with parafunctional activities. Only six patients in present study reported occasional habit of nail biting. Ali K et al. reported that clenching and tooth grinding had consequential association with tooth wear. 20.2% of tooth wear patients were found with same problem.[3] Another study conducted by Shahab et al found that 7.6% study population were observed with parafunctional activities & 45.2% reported with pan chewing habit[18]. In the current study 16.05% population used hard bristle, 45.9% medium and 38.34% soft tooth brush. Mushtaq et al concluded that abrasive lesions had significant correlation with using various kind of toothbrushes (p<0.05)[19]. Another study also delineated that tooth wear due to medium bristles tooth brush was 41.2% with horizontal method in 69.2% of the population[18]. All these outcomes coincided with research performed by Oginni et al[13].

Different clinical studies demonstrated that various endogenous causes for example vomiting or gastric reflux and exogenous causes of acids (carbonated drinks, vinegar and citrus fruits) plays contributory role in development of dental erosion.[20]Our study reports that 30% male and 35.3% females are frequent consumer of carbonated drinks and 44.16% had a problem of GERD. Another study reported acid reflux as a major causative factor of dental erosion[21]. However Lussi et al Dugmore et al and Bardolia et al did not report firm correlation of erosive wear and risk factors for example soft fizzy drinks[21,22,23].

In the light of recent literature, various causative factors have positive potential to culminate tooth surface loss. Tooth wear is a common problem, but most often left untreated. Every third person in Pakistan has suffering from tooth wear but unfortunately most of the patients are unaware of this condtion[24]. Tooth surface loss is a preventive condition mostly confronted by general dentists. To prevent more deteriorating TW condition, it is important to identify the causative factors in its early steps.

CONCLUSION

The incidence of Tooth surface loss with advancing age is on the rising trend in Pakistani population. In our study, tooth wear was more commonly seen in males as compared to female. Dentists need to pay close attention to various etiological factors associated with tooth wear that may lead to its effective management. We recommend that public awareness programs & campaigns related to screening for signs, symptoms and risk factors should be arranged because prevention and early intervention can forestall later complicated & extensive surgical, endodontic and cumbersome restorative treatment.

Conflict of interest: None to be declared

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