Research Paper: Assessment of different types of dental wear prevalence in patients referred to prosthodontic department of Guilan University in 2019.

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ABSTRACT

Introduction: Determining the prevalence of tooth erosion in each population with the aim of estimating dental health status and identifying risk groups is a research necessity. Evidence suggests an increase in the prevalence of this disorder in the population. This study aimed to investigate the prevalence of dental wear in patients admitted to the dentistry department of Guilan was conducted.

Materials and Methods: This cross-sectional descriptive – analysis study of 140 patients in Guilan University of Medical Sciences in 1398 will be evaluated. Demographic information about the gender and age of the patients were collected and analyzed in terms of tooth wear (Erosion, Abrasion, Attrition, Abfraction) were examined. The data were analyzed by software SPSS for windows version 16 at the significant level of 0/05.

Results: Descriptive findings showed that out of 140 people, 85 (60.7%) women and 55 (39.3%) were male. Also, the age distribution of participants in the research showed that the age group was less than 50 years old (49.3%) and the age group was over 50 years old (50.7%). The mean age of the participants in the study was 29.25 ± 15.7. In the sample, Attrition showed the highest prevalence with 75.2% and Abrasion with 0.7% lower prevalence. The prevalence of multiple lesions and Erosion was 4.1% and 22.6%, respectively

Conclusion: Among the various dental abrasions, Attrition was the highest prevalence in the population. There was no significant correlation between age and gender with different types of tooth wear.

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Introduction

Tooth wear is defined as the progressive loss of material which is a complex and multifactorial phenomenon with the interplay of biological, mechanical, chemical, and tribological factors (1,2) and is considered a physiological process with an expected rate of approximately 11μm per year (3). Tooth wear can be classified as attrition, erosion, and abrasion.(4) Attrition is known as the loss of tooth substance due to tooth-to-tooth contact during normal or parafunctional masticator activity.(4) Abrasion is described as the pathological wear of dental hard tissue through bio-mechanical frictional processes, e.g. tooth brushing.(5) Erosion is resulted from acid dissolution of either an intrinsic or extrinsic origin, e.g. gastric acid or dietary acids.(6) Abfraction is the pathologic loss of dentin and enamel caused by bio-mechanical loading forces.(7) Previous research has assessed the prevalence and severity of dental wear which is higher in men, mainly on the incisal/occlusal surface and on the primary canines and molars.(3-6) Also, it was concluded that wear in deciduous teeth increases with age, while the wear of permanent teeth in adolescents does not correlate with age.(3) In 2010 Jana Cunha-Cruz estimated the prevalence of tooth wear and investigated factors associated with tooth wear in patients from general practices in the Northwest United States and a higher prevalence of tooth wear was observed among males and older participants.(8) While, in 2012 Bader K AL-Zarea evaluated the severity of tooth surface destruction and related risk factors in sample of adults in Suadia Arabia. He stated that unlike age, gender didn't influence the etiology of tooth wear.(9) Determining the prevalence of dental wear in any population with the aim of estimating dental health status and identifying at-risk groups is a research necessity. Due to the high prevalence of dental wear-related lesions in the society and the fact that there is not enough information about the condition of the lesions in the Iranian society, and also due to the fact that similar studies in this field have not been conducted sufficiently in Iran, and on the other hand, the complete dependence of the prevalence and the condition of different types of these lesions depends on the biogeography of the person and the habits and lifestyle of his area, which makes it impossible to generalize the results of other countries' studies to our society. Therefore, this study aims to evaluate the prevalence of types of dental wear and how age and gender influence it in the patients of Guilan Dental Faculty.

Materials and Method

This cross-sectional descriptive - analytic study with ethical number of (IR.GUMS. REC.1398.255) was conducted to investigate the prevalence of various types of wears in 140 patients selected randomly from those referred to Guilan University of Medical Sciences. The patients with the history of current orthodontic treatment and those with mixed dentition were excluded from the study. All participants signed written informed consent prior to enrolment and were free to leave the study at any time without providing an explanation.

The demographic information (Gender and age) as well as the type of dental wear were gathered. Diagnosis of the wear was performed under suitable light with appropriate appliance using standard examination methods by one clinician.

When evaluating different types of tooth wear, signs of attrition were registered if glossy plane facets with sharp margins were found on occluding surfaces. Signs of erosion were recorded and used to determine the etiology: reversed V-sign incisal on maxillary central incisors, thin enamel on the palatal surface of the maxillary incisors, loss of the distinct shape on the tooth surface, thinning out of the enamel without signs of attrition, loss of surface lustre, raised restorations, grooves on the cusps or incisal edges and/or restorations rising above the level of the adjacent morphology. Abfraction lesions can also present themselves as C-shaped lesions with rounded or mixed bottoms. The

signs of abrasion lesions are: they are usually located in the cervical areas of the teeth and the lesions are wider than deep, premolars and cuspids are usually affected.

All the information that is taken from the volunteers participating in the research and also their names will remain confidential and the results of the research will be published in general and in the form of information of the studied group, and individual results will be presented if needed without mentioning names and personal characteristics.

The data were analyzed by software SPSS for windows version 16 (IBM Crop., Armonk, NK, USA). The description of the continuous quantitative variables was expressed by mean and standard deviation. The normality of the distribution of groups was evaluated by Shapiro–Wilk test. Moreover, to compare the groups, the Fisher and Chi-square tests were performed. The changes in postoperative complications were assessed by the Friedman test in each group. A $P < 0.05$ was considered statistically significant.

Results

According to the data, 60/7 % of participants (85 individuals) were females (39/3 % were males). The mean age of participants was $51/29 ± 7/15$ years old. The youngest participant was 32 and the oldest was 69 years old. Also, 50/7 % were older than 50 years old (71 individuals) and others (69 individuals) were younger than 50 years old. The prevalence of tooth wear is obvious in table 1. Attrition was the most common finding in both male and female participants (75/7%). However, no significant difference was seen in term of gender in the type of tooth wear.(Table 2) Same result was found considering the age; no significant relation was observed between age and type of tooth wear but attrition was the most common finding in the both groups.

Table 1: Prevalence of different types of tooth wear.

Type of wear	Number	Percent
Abrasion	1	0/7%
Attrition	106	75/7%
Erosion	31	22/6%
Attrition & Erosion	1	0/7%
Erosion & Abfraction	1	0/7%
Total	140	100%

Table 2: The relation of type of wear with gender and age.

Type of wear		Abrasion Number(Percent)	Attrition Number(Percent	Erosion Number(Percent)	Attrition & Erosion Number(Percent)	Erosion & Abfraction Number(Percent)
Gende	female	1(1/2)	63(72/3)	20(24/1)	1(1/2)	1(1/2)
	male	0(0)	43(79/6)	11(20/4)	0(0)	0(0)
P value		0/999	0/331	0/611	0/999	0/999
Age	Younger than 50 years old	0(0)	52(77/6)	15(22/4)	0(0)	0(0)
	Older than 50 years old	1(1/4)	54(72/9)	16(22/9)	1(1/4)	1(1/4)
P value		0/999	0/520	0/948	0/999	0/999

Discussion

Current study aimed to evaluate the prevalence of different types of wear (one type or multiple types) in 140 patients referred to GUMS.

Among the 85 females and 55 males, the mean age was 50 years old approximately. Although it is difficult to accurately compare the results of this study with other prevalence studies due to the differences in the indices used, the study criteria, the diagnostic criteria,

and the tooth surfaces examined, it appears that the prevalence of attrition is greater than others (75/2%), following by multiple lesion (Attrition & Erosion - Erosion & Abfraction) (1/4%). Unlike our findings, Ibiyemi et al reported that among the 200 patients participated in their study in Nigeria, 34/5 % had attrition and 48% had multiple lesion.(10) The difference may be due to geographical differences and variation of habitual life style.

Current findings reported a 22/6 % - prevalence of erosion while Chu et al stated that erosion was observed in 44 % of chinese junior college students.(10) Meanwhile, Zahara et al reported 68 % of erosion's rate in Malaysia.(12) Also, Deery et al, achieved to numbers of 41 % and 37 % for American and English teenagers' erosion, respectively.(13)

Recent investigation showed no significant relation between age and gender with prevalence of tooth wear. Piccoli et al highlighted the high degree of tooth wear in men resulted from the difference of chewing force in men and women.(14) Regarding the age, Seligman et al found that the severity of wear is not related to age up to 40 years old. However, Al-Zarea noted that the positive relation of age and wear prevalence.(15) This controversy may be due to the different mean age of participants. Although the controversy of the results may be due to the variation of identification indicators, demographic differences such as age and gender. Nutritional status, oral hygiene methods, and parafunctional habits can also be play a role in the occurrence of the difference in the prevalence of dental wear.

The results of this study should be interpreted with caution because of its limitations and potential risk of bias. A convenience sampling technique was employed, because this study was unable to access a wider population due to time and cost constraints. This non-probabilistic method may cause a significant amount of selection bias, because participants were not selected in a random manner. Whether or not, it is considerable that dental wears can affect life quality significantly and their treatment can be complicated in some cases; knowing their prevalence in term of type may help the clinicians to make better decisions programming preventing plans primarily. As the prevalence and type of wear are biogeographical, habitual, and life-style depended factors, it is suggested to design studies with similar aim in different geographical regions of Iran. Also, the authors recommend to evaluate the prevalence of wears' type in children specifically.

Conclusion

An improved understanding of the factors associated with tooth wear may lead to more effective interventions. In conclusion, tooth wear is a prevalent condition in the adult population (older than 50 years) and female gender. Attrition was the most common type of tooth wear regardless the gender and age.

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