

Clinical Study Regarding the Association Between Some Etiological Factors and Tooth Wear

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Background: Loss of hard dental tissues is a permanent problem of the dentition that affects all age groups and is regarded as part of the ageing process and a modern problem for dentistry.

Objective: The purpose of this study was to evaluate the prevalence of some etiological factors connected with the tooth wear process.

Material and method: One-hundred-fifty patients were investigated, 84 of them presented different types of tooth wear: abrasion, attrition, erosion and the combination of these. In order to determine the etiological factors we used the association of anamnestic questionnaire, clinical examination, digital photography. The etiological factors were classified according to their action with age, oral hygiene habits, parafunctions and unhealthy habits, chronic diseases associated with regurgitations and vomiting. Frequencies and percentages of variables were reported. Chi-square test was used to test associations between categories of variables at 5% level of significance.

Results and discussion: 51.19% of patients had more than one type of tooth wear and 22.62% had attrition. There was a significant association between tooth wear lesions and age, toothbrushing technique and type of toothbrushes used. Diet, parafunction and vicious habits, regurgitation and vomiting were not significant for tooth wear lesions.

Conclusions: The acknowledgement of the etiological factors is important for prevention and treatment approaches.

Keywords: tooth surface loss, tooth wear, tooth abrasion, tooth erosion

Introduction

Tooth wear is a hard tissue loss unrelated to dental caries. Noncarious loss of dental tissue is a physiological, normal process that takes place throughout life and occurs as a natural consequence of ageing [1]. If the rate of loss is likely to prejudice the survival of the tooth, or is a source of concern for the patient, then it may be considered pathological [2]. Several factors such as abrasion, attrition and erosion have been used to describe the noncarious, pathological loss of dental tissue. Determining the cause of tooth wear is important in its treatment management. A detailed case history is essential in any investigation of patients suffering of any form of tooth wear.

Consideration should be given to the patient's general health, nutritional and oral hygiene habits, occupation, environment and lifestyle patterns. The presence of conditions which may be associated with acid regurgitation, reflux or vomiting must be investigated [3]. Bruxism and other parafunctional habits should be assessed [4].

The objective of this study was to investigate the association between certain types of tooth wear lesions with age and oral habits in a group of patients.

Material and method

One-hundred-fifty healthy patients aged 18–70 years were investigated between 2008–2010. The examination and assessment were carried out with their written consent. The group did not present any multiple caries, untreated periodontal conditions, ongoing orthodontic or bleaching treat-

ments. Prior to clinical examination the group was given a questionnaire with the following sections:

- Personal data: age, sex, occupation, lifestyle;
- General health status: presence/absence of major health problems, medication, associated conditions determining regurgitation, vomiting, parafunction or unhealthy habits;
- Dietary patterns: types of food (abrasive or acid), frequency and period of intake;
- Type of oral hygiene and products used: frequency and type of brushing (horizontal, vertical, circular), type of tooth brush and toothpaste (abrasive or not);
- The examination was carried out according to the specific methods of diagnosis and etiological factors leading to the dental wear process.

The clinical examination was performed by means of usual instruments (probe, mirror, pincers), unit light, dry environment, after professional brushing aimed at removing debris from the oral cavity. Teeth with massive deposits of scale were excluded. Presence/absence of wear aspects, shape, type, location, degree and size of wear were examined.

Elastic material impressions were obtained in order to manufacture hard plaster models for study and diagnosis. Photographic and digital images of the lesions and intraoral dental radiographs were performed. Chi-squared tests and Fisher's exact test were performed using GraphPad software, to determine the association between the variables and tooth wear.

Table I. Relationship between age and tooth wear

Age (years)	Present	Absent	%	p value
18–30	22	49	47.33	<0.0001
31–50	41	56	37.33	
≥51	21	21	15.33	
Total	84	66	100	

Results

The following results were obtained:

Age

Most of the patients, 71, were aged between 18–30 years (47.33%), 56 were aged between 31–50 (37.33%), and 23 were over 51 (15.34%). The frequency of tooth wear was higher for the 31–50 group, associated with statistically significant wear lesions ($p = 0.0001$)(Table I).

Types of wear

Table II presents the frequency of different types of dental wear: 15.84% abrasion, 22.62% attrition, 10.71% erosion. 51.19% of the patients presented multiple types of wear: attrition + abrasion, attrition + erosion, abrasion + attrition, erosion + abrasion, attrition + erosion + abrasion.

Toothbrush

Frequency of brushing was, in most cases (66) once a day ($p = 0.8727$) and extraused of abrasive toothpaste ($p = 0.6055$) was not statistically significant to the development of wear lesions.

The toothbrushing technique, consisting mostly of vertical movement ($p = 0.066$) and the type of toothbrush medium ($p = 0.001$) are statistically associated with this type of lesions (figure 1).

Table II. Relationship between age and tooth wear

	n	%
Abrasion only	13	15.84%
Attrition only	19	22.62%
Erosion only	9	10.71%
Multiple tooth wear lesions	43	51.19%
Total	84	100%

Diet

Even mostly acid or abrasive diet is not statistically significant in tooth wear (figure 2).

Parafunctions

Parafunctions, unhealthy habits and chronic diseases associated with regurgitations and vomiting were noted in a smaller group of patients (66) with no statistical significance ($p = 0.2995$, $p = 0.0578$, $p = 1.000$)(figure 3).

Discussions

Tooth wear can be considered physiological, normally appearing with age [1].

Our study showed that most of the patients exhibiting tooth wear were aged between 31–50, the finding being supported by other similar studies which show that tooth wear, as a cumulative process, is always associated with ageing.

Factors such as erosion, abrasion, attrition can determine tooth wear to become pathological, therefore it is extremely important that etiological factors be identified and physiological wear be differentiated from pathological wear.

51% of the patients presented multiple types of wear, this percentage showing that tooth wear is a complex multifactorial biological process that can impair the functioning of the orofacial system [6]. Higher prevalence of attrition and abrasion as compared to erosion contradicts some

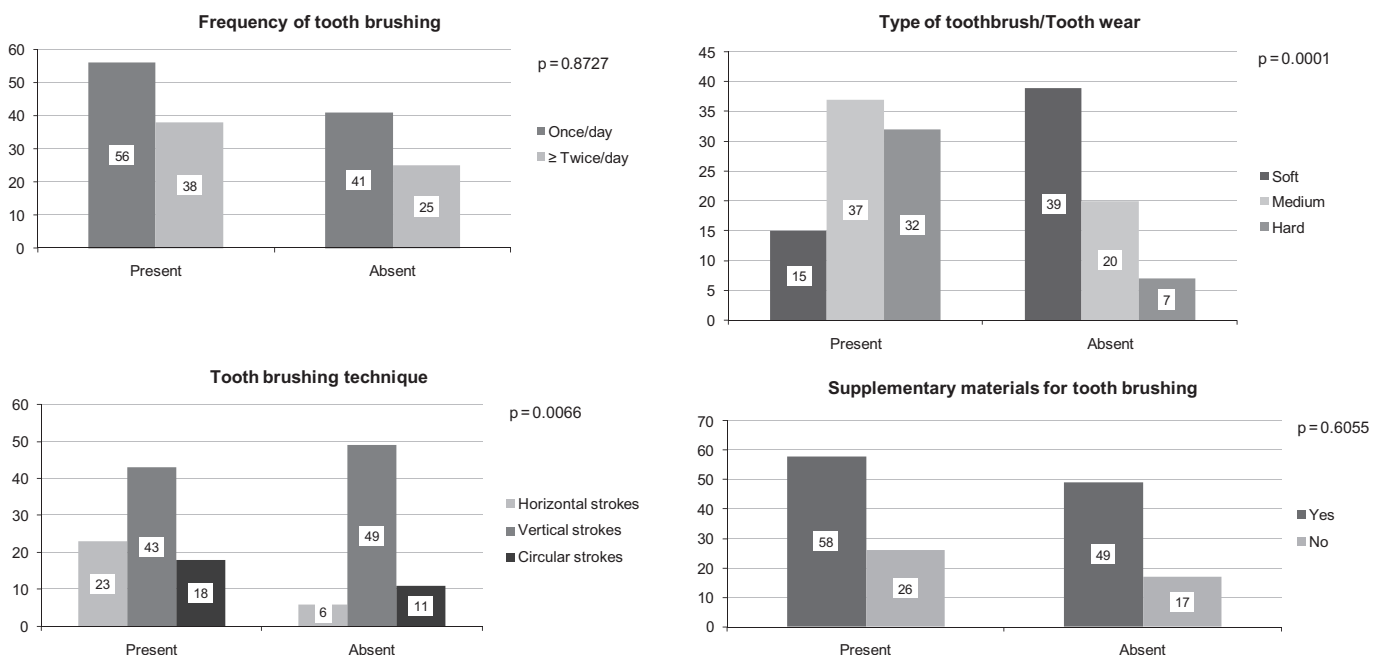


Fig. 1. Relationship between toothbrushing and tooth wear

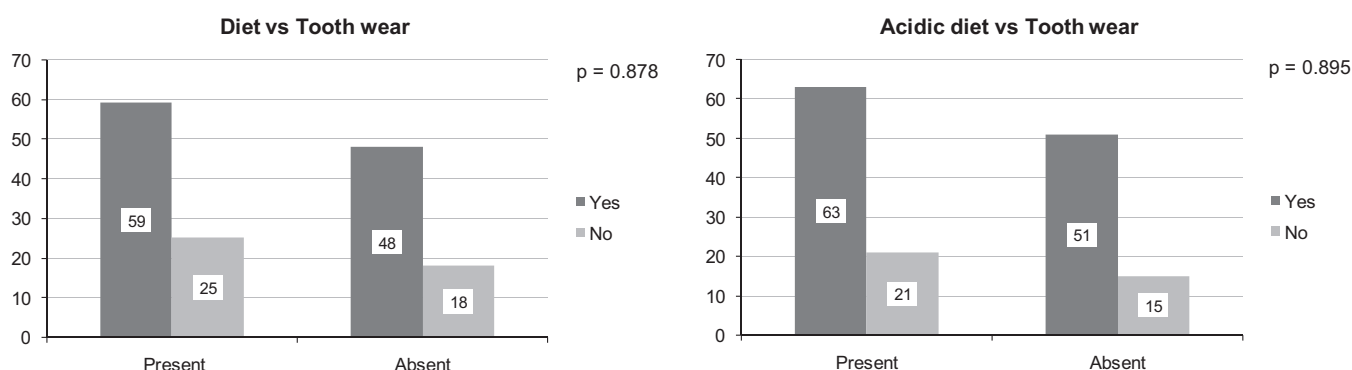


Fig. 2. Relationship between diet and tooth wear

of the previous studies [7], mostly due to different dietary patterns and oral hygiene habits from the areas where the respective studies were carried out. Attrition can be influenced by certain types of therapeutical procedures or their absence.

Several studies showed that oral hygiene patterns, such as frequency of brushing, type of toothbrush or abuse of abrasive toothpaste are usually associated with tooth wear [8]. The data in our study shows that most of our patients perform an improper brushing with vertical movements using hard toothbrushes. The frequency of brushing or the use of abrasive toothpaste are significant in tooth wear.

Other authors [9] consider that abrasive or acid diet can be connected to tooth erosion or abrasion. Fat free and "healthy diet" are considered extremely important nowadays. However, these types of diet can contain acid and abrasive substances acting as accelerators of tooth wear. Even if our patients have been following this type of diet, it was not significantly associated with the development of tooth wear. The lack of statistical significance may be explained by the efficiency of the oral defence mechanism that reduces the negative effect of acidity and abrasion rather than the lack of interaction with triggering etiological factors.

Other data from the literature [10] show that bruxism, vicious habits or a history of broken restorations at least once a year are strongly associated with the presence of tooth wear lesions.

The association supports the theories regarding the etiological role of occlusal factors. Regurgitation, as well as gastric diseases, that cause vomiting, is also related to tooth wear. This process was not present in our study group,

therefore no significant association could be established between these kind of habits and tooth wear.

Conclusions

1. Tooth wear is a cumulative process, which appears and increases with age, representing a major diagnostic and therapeutic problem.
2. Acid or abrasive diets have a noxious effect, especially with the lack of proper defensive mechanisms.
3. It is necessary to develop educational programs involving methods and techniques of hygiene.
4. Determining the causes of tooth wear is important in its management. Unless the etiological factors are identified and preventive treatment initiated, the wear will continue. Considerations should be given to the patient's general health, nutritional habits, oral hygiene habits, occupational environment and lifestyle patterns.
5. A great number of factors seem to be associated with tooth wear, supporting the theory that the etiology of these lesions is multifactorial.

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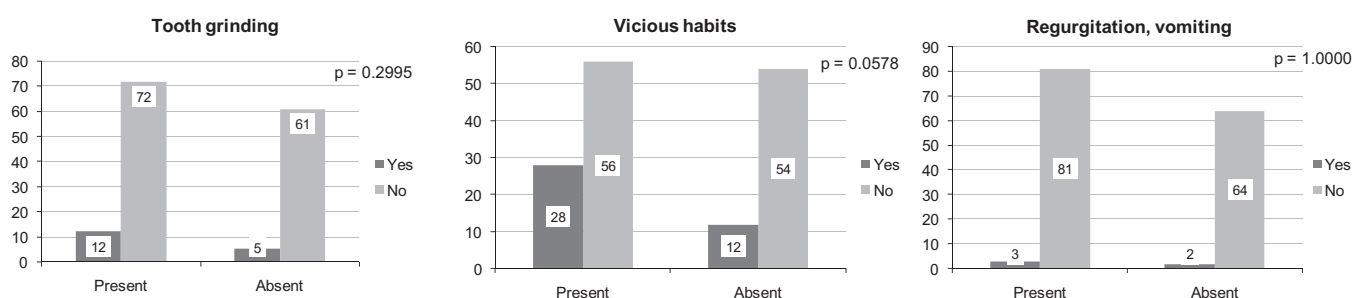


Fig. 3. Relationship between some habits and tooth wear

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