

DENTAL EROSIONS – ACTUAL PROBLEMS OF DENTAL MEDICINE

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Abstract: Etiological, dental erosion depend mostly on intrinsic factors (who induce the gastro-duodenal ebb and vomiting) and on extrinsic factors (frequent consumption of fruits, juice and low pH beverages). Acid pH food capacity of producing erosions was proved in vitro by softening the surface microhardness (SMH). The occluso-articular dysfunctional factors and the dental brushing are capable of bringing about particular manifestations of dental erosions. The unstimulated salivary flow, the buffer capacity of saliva and also the formation of salivary film play an important role in erosion prevention associated with dental hyper sensibility. The early diagnosis and the prevention strategy are able to limit the appearance and evolution of the erosive lesions.

Keywords: dental erosion, acid pH food, preventive measures

Rezumat: Eroziunile dentare sunt în cea mai mare măsură dependente de factorii etiologici intrinseci (care determină reflux gastro – duodenal sau vomismente) și de factorii etiologici extrinseci (consumul frecvent al sucurilor de fructe și a băuturilor cu pH – ul scăzut). Capacitatea alimentelor cu pH acid de a produce eroziuni, a fost dovedită in vitro prin scăderea durității superficiale a smalțului. Pe lângă acestea, atât factorii disfuncționali ocluzo-articulari, cât și periajul dentar efectuat incorect ca tehnică dar și ca timp, pot determina manifestări particulare ale eroziunilor dentare. Fluxul salivar nestimulat, capacitatea de tamponare a salivei, cât și formarea peliculei salivare dobândite de natură muco – proteică au un rol important în prevenirea eroziunilor și a hipersensibilității dentinare. Diagnosticul precoce și strategia preventivă este o cale de a limita apariția și evoluția leziunilor erozive.

Cuvinte cheie: eroziunea dentară, alimente cu pH acid, măsuri preventive

INTRODUCTION

Dental diseases, as a result of decays are decreasing in the recent decades, while dental erosions prove an increase of their prevalence with 5-92%.(1, 2)

Dental erosions are mainly due to the modern diet of the industrialized countries, based on an increased consumption of fruit juices and soda drinks, combined with an occluso-articular imbalance or with inappropriate hygiene methods.

In literature, the loss of tooth substance is described under the form of two clinical entities: dental abrasion or abfraction.

Dental abrasion is the term associated with dental wear, caused by excessive friction moves.

Abfraction is a term that is based on a still controversial hypothesis, according to which there is a dental tissue cleavage at the level of the dental neck.

The erosion pathological effects are manifested by dentinal hypersensitivity of the dental neck, aesthetic problems and loss of the vertical dimension.

Extrinsic causes of dental erosions are the following:

- diet
- professional environment
- contributions of certain drugs

In diet, the erosion potential is assigned to the beverages containing citric acid, acetic acid, carbonic or phosphoric acid, but also to long vegetarian diets. Beside the beverage pH, we must also take into consideration the buffer ability of saliva in order to neutralize acidity (Table no. 1).

Table no. 1. The pH and quantity of basic substance necessary for neutralization. (4)

Substance	Commercial product	pH	m mol/l pH for a pH 7
Mineral water	Perrier	5,3	29
Soda	Coca Cola	2,45	44
	Coca Cola Light	2,70	46
	Orangina	3,40	75
Beer	Heineken	4,37	44
Juice	Fresh apple juice	3,36	66
	Fresh orange juice	3,82	92
Milk	Low fat milk	6,65	5

Professional environment – for example, swimmers, whose teeth are in frequent and long term contact with water containing sodium hypochlorite, which causes dental erosions, sometimes even changing the

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colour of the teeth.

In case of frequent intake of C vitamin or some solutions of chlorhidric acid, erosions on the oral parts of teeth may occur.

The intrinsic causes of dental erosions are brought about by:

- gastro-duodenal flow
- chronic vomiting
- some disease that cause acute or chronic inflammation of the salivary glands (Sjogren syndrome), but also the antidepressant treatment and substances, antipsychotic, antihypertensive agents, diuretics, anti-Parkinsonian drugs. They reduce salivary flow and increase the risk of dental erosions.

Regarding the gastro-intestinal flow, caused by organic and functional causes, erosion damages are observed in 24% of the cases.(2,4) They are present on the lingual faces of the maxillary and mandibular incisors.

Chronic vomiting during pregnancy, stress or alcoholism can cause erosions on the oral teeth surfaces.

Anorexia and bulimia in teenagers also determine vomiting and lead to oral erosions.

Xerostomia of the old people also contribute to dental erosions, if the diet is not under control.

There is a synergy between the etiology of dental erosions and dental hyper sensibility. Frequent consumption of fruit juice, as well as a prolonged vegetarian diet can cause dental tissue erosion. The dentinal tubes are open to the environment of the oral cavity, leading to the displacement of the fluid from the dentinal tubes, which determine the stimulation of the pressure receptors of the A Beta and A Delta fibres from around the odontoblasts (the hydrodynamic theory of dentinal hypersensitivity - Brannstrom).

In vitro, it has been proved that acid pH food is able to decrease the superficial hardness of the enamel. Table 2 presents the changes produced by different types of food on certain immersed teeth, for 6 minutes. The measurement of the Surface Micro Hardness (SMH) has been done by using the Knoop scale with an estimated weight of 50 grams.

Table no. 2. Different foods and their effects on enamel Surface Micro Hardness.(5)

Beverage	ph	OH > pH 7	SMH before	SMH after 6 minutes	Difference
Apple juice	3	102	352	151	-201
Fresh orange juice	3,64	136	353	209	-144
Yogurt with orange	4,08	101	354	355	+1
Ice Tea	3	26	338	187	-151
Coca Cola light	2,6	34	349	186	-163

The most important changes in enamel surface hardness are found in the following beverages: apple juice, Coca Cola and orange juice, according to table 2.

Saliva, in opposition to the acid food, preserves an area of supersaturation of Ca and Po₄ ions through its well-known mechanisms of dilution and clearance, using this area during remineralization. The acquired salivary film has a particular role in achieving this last salivary function.

The salivary film is destroyed by: abrasive products, professional brushing with strong abrasive tooth paste and tooth whitening. The necessary time to restore the salivary film is between 3 minutes and 7 days.(5)

Dental erosion is an insidious process. The patient notices this only in an advanced stage. Knowing the causes that lead to this dental affection is the best way to prevent it. The most appropriate recommendations for the patient are:

- Specialized medical consultation in case of disorders caused by the gastro-duodenal flux, bulimia, or anorexia.
- Reducing the frequency of fruit juice and beverage exposure.
- Limiting the habit of keeping the beverage in the mouth and encourage the use of the straw.
- Avoiding dental brushing before or immediately after the exposure to low pH liquids.
- Encouraging the use of remineralising and neutralizing solutions based on flour, sodium bicarbonate, mineral water, milk, cheese, sugar free yogurt.
- Correct brushing technique with soft brush and without pressure.
- Stimulating the salivary flow by using sugar free gums.
- The use of fruit juice with added neutralizing substances such as sodium or carbonate phosphate.

The use of lakes with high fluoride concentration may stop the dental erosions.

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