

## FOOD SAFETY IN CORRELATION WITH FOOD RISK FACTOR IN PRODUCING CARIOUS AND NON CARIOUS LESIONS TO PERSONS AGED BETWEEN 30-40 YEARS OLD.

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### **Abstract**

*The purpose of the study is to distinguish the food risk factors in producing carious and non carious lesions to persons aged between 30-40 years old. In food health, one must take into consideration the implications of an inappropriate consumption of some food categories with carious potential on the occurrence of injuries to the dental structure with an irreversible character.*

*The carious risk is often defined as the probability for some dangerous events to exist [Anderson M.H., 1993]. In order to assess if new carious lesions could appear or if early lesions will continue to develop, one recommends that the carious risk is evaluated.*

**Key words:** food safety, food factors, carious and non carious lesions.

### **INTRODUCTION**

The carious disease is a transmissible infectious disease, produced by demineralization, changes in the mineral content of the hard mineral tissues and in certain conditions has a reversible and heals capacity through remineralisation processes.

Some authors (Anderson M.H., 1993) affirm that carious processes represent fundamentally a manifestation of imbalance between calcium and phosphate ions in dental tissue and saliva, mediated by bacterial plaque microorganisms and influenced by some factors (fluorine).

The cavity carious lesion appears when the result of this mineral balance is inclined very much on one side, through a net loss of the mineral salts from the hard dental tissues. When we modify the microbiological oral ecosystem with preventive and therapeutic measures, redeposit of minerals predominates resulting in the progressive stop of the lesion through remineralisation phenomena.

The dental decay is a phenomenon of external origin in the light of the fact that it does not affect the included or unerupted teeth whose surfaces are not directly exposed in the oral environment and acts both on vital and unvital teeth (Cherlea I.V., 2007).

The high content of acids contained by fruit and juices decrease the saliva's pH, increasing the possibility of local demineralization or chemical erosions appearance, likely to become future premises of decays. The

abundance presence of easy fermentable mono-saccharides (saccharose), is a key factor in cariogenesis, since a frequent saccharose exposure may represent the most important element in the develop of a pathogenic plate through quick synthesis of intracellular and extracellular polysaccharides of the *Streptococcus mutans*.

High fluoride content carry outs to a higher remineralisation capacity of carious lesions through the decrease of the dental structure solubility, the decrease of the surface energy of dental surfaces, weakening in this way the adhesion of the plate and blocking the transferase-glucozil which is involved in the metabolism of carbohydrates by *Streptococcus mutans*. The content in oligoelements is absolutely necessary both for the development and mineralization of dental buds and adjustment of the quantity and quality of the saliva. The increase of phosphate quantity in the diet will decrease the solubility of the inorganic dental substances (Andrian S., 1999, 2002)

Hard nourishment will have an effect on teeth by favoring a physiological abrasion of occlusal surfaces which will remove retention areas by stimulating saliva secretion with carious protective effect and a more efficient self cleaning. Saliva, with its buffer capacity, will favor the remineralisation of incipient lesions, while some trace elements reabsorbed from food (fluoride) have an essential anticarious effect.

The diet directly affects the dental structure, either by pH decrease due to food and acid juice abuse, or causing local demineralisation and cervical erosion (Fig. 1). Hard food and/or sour stimulate the salivary secretion helpful in the installation of remineralisation processes (Biclesanu C., 2009).



Fig.1. Cervical lesions caused by hard food.

The diet influences the bacterian activity by a large and long time presence of saccharose which favors through the elaboration of extracellular polysaccharides by *Streptococcus mutans*, the forming of an adhesive, thick and very carious plate (Lacatusu S., 1998; Domejean S., 2007; Iliescu A., 2011). Through content in agglutinative and neutralizing substances, the diet may also have an antimicrobial effect.

The diet is directly affecting the dental structure either by pH decrease due to repetitive consumption of acid juice and food, or by causing local

demineralisation(s) and cervical erosion(s) (Ederlton J.D., 1985; Andrian S., 1999)

Non-carious dental lesions represent a clinical entity frequently found among patients, representing a consequence of the normal development of the dento-maxillary system or other disturbing factors (Alexon P., 2000; Stoleriu S., 2002).

A part of this category is erosion, abrasion and abfraction which represent pathologic dental lesions (Fig. 2), as well as attrition which is considered a physiological action, (Alexon P., 2000; Stoleriu P., 2002).



Fig. 2. Dental erosions.

## **MATERIAL AND METHOD**

In order to achieve the proposed goal, 80 patients aged between 30-40 years old have been studied, to which carious and noncarious lesions have been followed (pursued), correlated with food consumption for a period of one year.

The chosen lot of people has been investigated with a questionnaire, whereby we wanted to find data about the presentation to the dental check-up, hygiene and food habits, respectively one has concentrated on specifying the quantity and frequency of carious potential food consumption: sugars, acid pH foods, soda drinks, etc.

Unhealthy food habits are an important risk factor. Motivating patients to adopt a decay preventive diet one has realized based on elaborating an individual food journal in which the patient is asked to write the type and timing of consumed foods for a week.

Long term consumption of foods that contain synthetic obtained additives, strains the body with a real chemical strafe which affects the internal organs (Domejean S., 2007).

Specialized studies show that long term use of various products favors the creation of such unbalance in the body.

Their occasional use, for a limited period of time has no damaging effect.

The decay appears on over 94% of the sugar product consuming population. Six times more than 200 years ago, before discovering sugar. The cause in fact, is not as one thought, that sugar and sweets favor the

development of bacteria on teeth, but the disturbance of an entire metabolic processes chain of calcium (Boitor G.C., 2005)

Our current life standard has lead to the progress of food technology, has imposed changes in the preserve, prepare and consume methods of food. Fast evolution in the competitive climate, doubled by customer's requirements and expectations, have promoted an excess offer of food types, determining in the same time high risks for illness due to contaminated or inadequate treatment of foods [Euro Protect Consum, 2011]

The quality and safety of food is based on the efforts of everyone involved in the food chain, composed by agricultural production, processing, transport and consumption (Ni□u T., 2008). Safety guarantee of the food refers to the classification in critical limits for additives components, pesticides residues and veterinary used drugs, allergen substances, pathogen micro-organism, infestation with insects and parasites [Euro Protect Consum, 2011]

Food safety is in the engage of all factors and the apply of all norms that support and ensure the production of some food products whose nutritious value and consumption are the foundation of a healthy nourishment (Banu C., 2008).

Production, packing, transport, storage and marketing of food products represent processes with a high level of risk for every consumer's health. The tendency of the food industry specialized market is more and more concentrated on maintaining a strict control on producers, aiming to offer high quality products to consumers, but also safe microbiologically and bacteriologically (Okenson J.P., 1996).

## **RESULTS AND DISSCUSIONS**

To confirm the analyzed factors as risk factors, one has used the statistic method of studying the dental lesions. Out of 80 patients, 48 have presented carious lesions, 25 have presented non-carious lesions such as demineralization and abfraction, and 7 had just periodontal lesions, without odontale lesions.

Based on the local clinical exam, radiological exam and the questionnaire regarding the type, quality and quantity of consumed food, resulted that carious lesions pacients, 29 of them (approx. 60%) have carious processes, the main causing factor being the consumption of carious potential foods, for the other 19 patients (approx. 40%), other than the described factors along with the nourishment, smoking and poor oral hygiene has been added (Fig. 3).

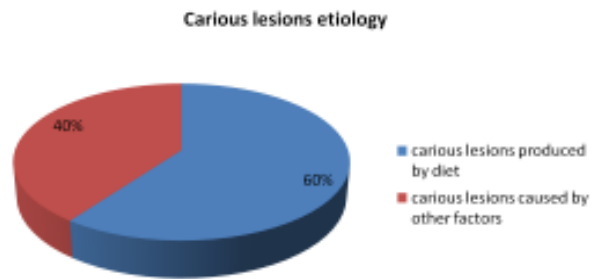


Fig. 3. Carious lesion etiology.

Out of the 25th non-carious lesion patients (Fig. 4), 6 of them (24 %) had a diet rich in carbonated drinks, sugar, etc, and the other 19 (76 %) presented a totally unsatisfactory hygiene with plaque accumulation and tartar on top of which vicious habits were added, such as smoking and bruxing.

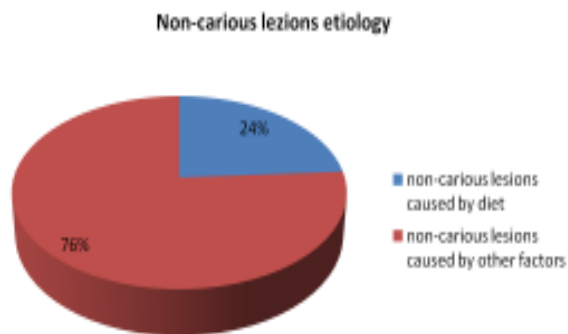


Fig. 4. Non-carious lesions etiology.

The study's results have therefore demonstrated that carious lesions, highlighted on adults had as a predominant etiological factor for 61% of the cases, the consumption of acid, sugar, etc.

In 24% of the non-carious lesions manifested as local demineralization and cervical erosions, the determining factors were represented by the abuse of carious food products and acid juice (Fig. 5).



Fig. 5. Cervical lesions caused by sweet drinks.

The patients have been informed after the study's results about the importance of balanced nourishment. The diet must contain a main group of 5 nutritive principles - carbohydrates, lipids, protein, vitamins and minerals. All these together with water are essential for life. In addition, food fibers are considered to be very important for a good health for a healthy being. Bacteria from dental plaque need just a small quantity of carbohydrates to produce acids, in this way the optimal conditions for carious processes initiation are created. The recommendations for reducing dental decay include reducing consumption of sweet food and drinks, and if possible, limiting their quantity during main meals only. It is also recommended to be avoided before going to sleep due to salivary flow and buffer capacity which are low during the night (Cherlea I.V., 2007; Domejean S., 2007).

Food habits, poor oral hygiene and plaque accumulation are playing (Brathall D., 1994) an important role in carious lesions (Gillam D.G., 2002). Consumption of carbohydrate products (products containing carbohydrates) between meals increases the incidence of dental decays (Fig. 6), especially for those with a poor oral hygiene (Gillam D.G., 1990).



Fig. 6. Cervical lesion caused by a diet rich in carbohydrates, associated with defective oral hygiene.

## CONCLUSIONS

Protecting teeth is not only a problem of dental hygiene but of nourishment (Bratthall D., 2004) also, therefore carious and non-carious lesions can be prevented also with a corresponding diet (Blique M., 2007).

It is not sufficient to limit the sweets quantity, but we must also introduce into our food diet, high mineral and oligoelements containing products (Featherstone J.D.B, 2004), which represent the construction material of our teeth.

Although the nourishment's part in dental decay's etiology has shown to be small, nevertheless it is not insignificant. Persons which are frequently consuming carbohydrates have a high risk of developing decays, and therefore it is necessary for them to modify their diet and/or show a greater attention towards their oral health.

In any case, for the big majority of people, the relative nourishment factor, a reduced factor comparing to the importance given to oral hygiene, through the use of fluoride products. Combining a preferred diet and a

strong oral hygiene is possible if one respects a few simple rules (Okenson J.P., 1996).

- washing teeth at least twice a day with a fluoride toothpaste.
- limit daily meals to a number of 6/day.
- a balanced diet.

Vitamins C and D are not be excluded for healthy teeth.

Absence of vitamin C leads to gums weakening, bleeding gums, and the deficit of vitamin D may lead to mobility of teeth, because the bone structure is weaker.

Food safety involves the engagement of all factors and the apply of all norms that support and ensure the production of some food products whose nutritious value and consumption are the foundation of a healthy nourishment (Banu C., 2008).

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