

CARIOGENIC RISK IN CHILDREN WITH SEASONAL ALLERGIC RHINITIS

Maria Bolat ¹, Sorin Andrian*¹, Smaranda Diaconescu²

¹ Gr. T. Popa" University of Medicine and Pharmacy- Iași, Romania, Faculty of Medicine, Odontology, Periodontology and Fixed Prosthodontics Department Faculty of Dental Medicine

² Gr. T. Popa" University of Medicine and Pharmacy- Iași, Romania, Faculty of Medicine, Department of Paediatrics, Vth Paediatrics Clinic, "Sfanta Maria" Emergency Children's Hospital, Iasi, Romania

*Corresponding author: **Prof. Dr. Sorin Andrian**, DMD, PhD

*Odontology, Periodontology and Fixed Prosthodontics Department
Faculty of Dental Medicine*

Email: sorinandrian@yahoo.com

Abstract

Introduction: Dental decay is one of the most common disorders of the oral-dental system, affecting 80-98% of the population. Identifying the factors that cause premature caries process has a significant impact in the success of specialized treatment.

The purpose of the study is to assess caries risk to a group of children diagnosed with seasonal allergic rhinitis, in the context of salivary levels of MS.

Material si method: 32 children aged between 7 and 12 years from rural areas take out with seasonal allergic rhinitis and under specific treatment, received dental checkup and determining the salivary level of MS using saliva kit Check Mutans. The working method included visual and tactile examination, recording individual data sheet and a questionnaire in which they were registered the dates for dental control presentation, oral hygiene habits and eating habits. **Results and discussions:** Saliva test made for assessing the level the MS was positive for all subjects, after its being placed in high caries risk category . It was found that subjects treated with Alerius shows a number of caries lesions smaller than those treated with histidine, but in addition, they have been identified with dental erosion.

Conclusions: we can sustain that salivary level of SM is closely related to the occurrence of caries and caries risk increasement. Further studies are needed to demonstrate that treatment with Alerius and Histidine for children with seasonal allergic rhinitis affects the number of MS and increase caries risk by the appearance of new cavities lesions.

Keywords: Cariogenic risk , Streptococcus Mutans, Seasonal allergic rhinitis

INTRODUCTION

Dental caries is an infectious chronic process with a multifactorial etiology: diet, oral microorganisms and host susceptibility must coexist for caries initiation and progression. The current approach to the preventive and curative treatment of dental caries requires the role knowledge of risk factors. Mutans Streptococcus plays an important role in the initiation of dental caries. When used with other clinical information, salivary level of this bacterium is useful for cariogenic risk assessment.

Seasonal allergic rhinitis, is one of the atopic disease with a risk of developing between 5 and 22%. It is characterized by rhinorrhea snoring, nasal congestion, nasal and eye pruritus. Oral damage occurs mainly through oral mouth breathing that these patients have, with repercussion on the development of maxillary and implications in the odonto-periodontal pathology of the upper front group.

The aim of this study is to evaluate possible relationships between oral hygiene, nutrition, treatment of seasonal allergic

rhinitis, the level of MS and to determinate cariogenic risk in the context of these factors.

MATERIAL SI METHOD

The study was conducted on 32 children aged between 7 and 12 years old, from rural areas, diagnosed with seasonal allergic rhinitis ,and under therapy. Dental examination was performed through visual and tactile palpation method, and the data were recorded in individual file. At this file was attached a questionnaire with 10 questions related to dietary habits, dental hygiene, consumption of soft drinks, tooth brushing frequency and number of visits to the dentist in a year.

All permanent teeth erupted were evaluated in terms of the index DMFT. The salivary level assessment of Streptococcus mutans was performed using test kit Saliva-Check Mutans (GC America Inc., Alsip, IL),

which provides a semi-quantitative assessment for the salivary level of Mutans Streptococcus within 15 minutes, using monoclonal antibodies . Patients with high levels ($> 5 \times 10^5$ CFU / ml of saliva) of Mutans Streptococcus have been identified in 15 minutes without any special equipment and without the bacteria cultivation.

Saliva-Check Mutans detects Mutans Streptococcus in saliva by a specific immunochromatographic process and does not rely on the growth of bacteria. Therefore, problems such as contamination with bacteria or other pathogens have been avoided. The test result is visually indicated with a line.

A kit of Saliva Check mutans contains ten tests, each set consisting of 10 test devices mutans, 10 gum wax, 10 pipettes 10 mixing tanks, 1 vial of Reagent # 1 (2 ml) and 1 vial of Reagent # 2- (4 ml). (FIG. 1)



FIG. 1 Individual package testing; Reagent # 1 and # 2 reagent; The container also device the gum wax test

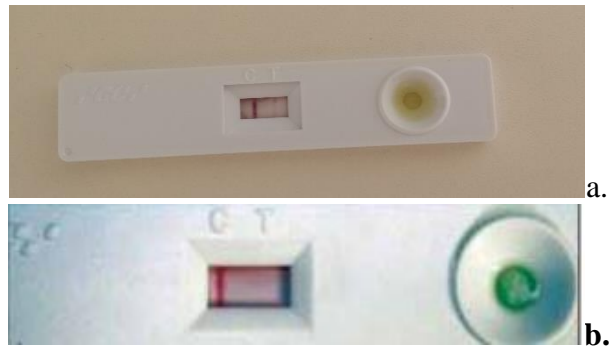
Before programming, subjects were instructed not to eat or drink, do not brush their teeth and do not use mouthwash at least one hour before the scheduled time. The subject was instructed to chew the paraffin gum for 1 minute, to stimulate salivary secretion, and do not swallow the gum. Stimulated saliva sample was selected in the container, has been remove any excess above the A line, the volume obtained reaching this milestone. Added a drop of reagent No. 1 in saliva. The container was tightly held and hit with a finger 15 times for 10 seconds to mix well the saliva and reagent No. 1. Reagent # 1 is an alkaline solution witch descends and

dissolves viscous components of saliva. This is an important step of the procedure which ensures that the saliva sample is capable of easily moving through the unit test. Subsequently were added 4 drops of # 2 (yellow) into the container and stirred for a few seconds, the sample of saliva staining the green color. Using the pipette, we collect enough saliva in the container, the pipette being filled up to the third line. The assay was allowed to stand for 15 minutes at room temperature. The indication that the test is properly functioning is the appearance of a thick red line in the control window (C) of test device. At the same time, it has been

checked also the test window (T). The result was positive if the thin red line appeared in the window T, indicating that the salivary level of Mutans Streptococcus is high ($> 5 \times 10^5$ CFU / ml saliva), thus the subject being considered with a potentially high risk for caries activity in future. The result is considered positive even if the line in the test window (T) is very pale. Reading the results was conducted right after 15 minutes, for

better accuracy. If the red line has not appeared in control window (C), the test was considered invalid.

A saliva test positive mutans Check translates into a number of Mutans S. per stimulated saliva greater than 5×10^5 CFU / ml saliva (Fig. 2a). A negative result indicates that the number of Mutans S. is less than 5×10^5 CFU / ml saliva (Fig. 2b).



**FIG 2. a) Testul Saliva-Check Mutans pozitiv;
b) Testul Saliva-Check Mutans negativ**

RESULTS

Of the 32 patients 15 were female and 17 male, aged between 7 and 12 years.

In the treatment of seasonal allergic rhinitis for 21 of the subjects were treated with Acrius syrup and 11 with Histidine syrup. It was found, after dental check, that 92% of subjects treated with Acrius had

dental erosion. Subjects treated with histidine shows no dental erosion, but the number of caries is higher compared to those treated with Acrius. The frequency of tooth brushing is 28% done 2 times / day and 72% for brushing performed once per day, especially in the morning

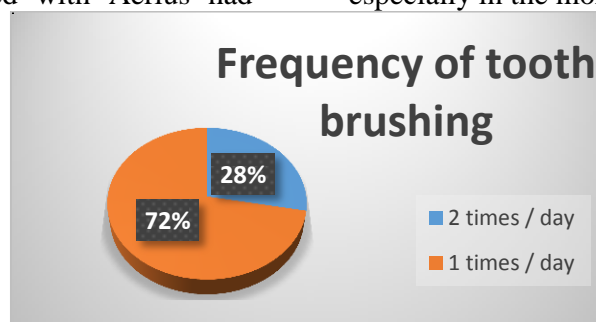


FIG. 3 Frequency of tooth brushing

Subjects nutrition is devoid of fish, food rich in fluorine which increases the stability of enamel crystals, inhibits demineralization, stimulates remineralization, inhibits the multiplication of bacteria and fluids the

saliva, thus having a carioproliferative role.

Insufficient intake of dairy products, subjects drinking only milk received daily in schools from the governmental program, which, the study in the Journal of Hygiene and Public

Health, vol.55, showed that has a deficit of 77% of recommendations. Also, the childrens received bread of the same governmental program, bread that contains white flour, and is classified in the category of cariogenic food.

DMFT index ranged between 7 and 21 with an average of 13.43. The average

value of DMFT index in females was 15.71 and at 18.44 the male.

Saliva Check Mutans test was positive in all 32 cases, so there is a direct correlation between increased salivary level of Streptococcus mutans and increased DMFT index, subjects having a high caries activity.

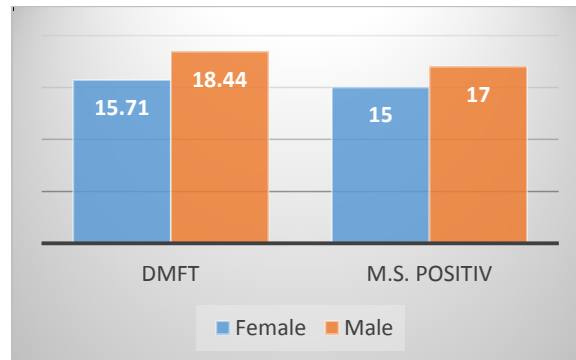


FIG. 4. Correlation between saliva Check Mutans test and DMFT index

None of the subjects presented permanent or provisional restorations of carious lesions, and the questionnaire revealed that this is the first visit to the dentist that they made.

DISCUSSION

Over the years there have been numerous studies evaluating the salivary level of Mutans Streptococcus, highlighting the close connection between it and the risk of caries for investigated subjects.

The main role of salivary level knowledge of Mutans Streptococcus is to predict the future carious activity of the patient. Following a thorough clinical examination, associated with laboratory tests, the treatment plan will be a guaranteed success.

After using methods for determining caries risk the patients will benefit of prophylactic methods to improve dental care and to prevent new carious lesions. Also, prevention methods established in children after detection of Mutans S. in saliva levels have the greatest efficiency.

CONCLUSIONS

1. There is a significant connection between salivary levels of Mutans Streptococcus and carious activity.
2. We support that nutrition factors, poor dental hygiene and lack of periodical control, leads the patient assignment in a group with high caries risk.
3. Some limitations of this study include the fact that certain answers given by subjects might be considered questionable, and the small group of subjects investigated.
4. Dental erosion were found only in subjects undergoing treatment with Aerius syrup.
5. Further studies are needed to demonstrate an association between dental erosion occurrence and treatment of seasonal allergic rhinitis with Aerius syrup.

Bibliography:

1. Diagnosticul și managementul modern al cariei dentare CORNELIA BICLESANU Facultatea de Medicină Dentară, UMF „Carol Davila” București, Craiova Medicală Vol 10, Nr 3, 2008
2. Caries risk assessment in the context of salivary levels of Streptococcus Mutans and preventive dentistry Dr. Mihai Ciortea¹ , Drd. Dr. Claudiu Ciortea¹ , Asist. Univ. Dr. Oana Slușanschi² București, REVISTA ROMÂNĂ DE STOMATOLOGIE – VOLUMUL LX, NR. 2, AN 2014
3. Allergic rhinitis – Robert M. Naclerio, M.D. , The English Journal Of Oral Medicine, pag 860, Sep 19, 1991
4. Boboc G – Anomaliile Dentomaxilare. Editura Medicală, București 1971; 79;
5. Boboc G – Aparatul Dentomaxilar. Formare și Dezvoltare. Editura Medicală, București 1996; 317-330;
6. Dumitriu HT – Parodontologie, Editura Viața Medicală Românească, 1999; 94;
7. Saliva check Mutans instructions - www.gcamerica.com
8. Nishikawara F., Katsumara S., Ando A., Tamaki Y., Nakamura Y., Sato K., Nomura Y., Hanada N. Correlation of cariogenic bacteria and dental caries in adults. J Oral Sci 2006; 48 (4): 245-251.
9. Moynihan P., Petersen E.P. Diet, nutrition and the prevention of dental disease. Public Health Nutrition 2004; 7 (1A): 201-226