DENTAL DECAY FREQUENCY AND THE EXPOSURE OF MUCO-BACTERIAL PLAQUE

ALINA CRISTIAN[1], GABRIELA BOȚA[2]

[1,2] *"Lucian Blaga" University of Sibiu*

Keywords: *dental prevention, disadvantaged children*

Abstract: *Through this paper we want to bring the tooth decay problems of disadvantaged children in a different light. Not only we examined a large number of children between 8-10 years old in Sibiu but we also revealed the tooth decay problems. By using special revealing kit we tried to make children aware of their problems, we treated tooth decay, we did oral hygiene and also taught the children how to use correctly a tooth brush.*

INTRODUCTION

Oral health is essential to general health and it deeply affects the quality of life. Therefore prophylaxis must be the main purpose of the physicians.

The dentist may implement the primary prophylaxis before the installation or the beginning of the disease and may contribute to the development of helpful habits of oral health so that dental and oral structures are optimally preserved as long as possible.(1,2,3)

Oral microbial flora is particularly complex as it contains approximately 300 microbial species in a continuous dynamic balance. Major dental disorders, tooth decays and periodontal disease are determined by a series of complex factors among which microorganisms have a crucial part.

Thus, the pharmaceutical formulae for oral hygiene should have an antimicrobial effect as strong as possible both in the prevention and the therapy of these pathological processes.(4,5)

For an optimum oral health, oral hygiene products should also have a biological effect of destruction or inactivation of certain bacteria in the oral cavity.

PURPOSE

The purpose of this presentation is to detect the odontoid lesions in institutionalized children from Sibiu county and also to create an information feedback for the parents / authorities on the dental status of children at the time of examination.(6)

- Assessment of odontoid status in institutionalized children;
- Raising awareness of children about the improvement of oral hygiene;
- Increase the frequency of dental brushing;
- Improvement of oral hygiene and of brushing methods;
- Increase of dentist addressability;
- Data centralization;
- Notify the competent authorities responsible with the health status of children on the data obtained through program coordinators.

MATERIALS AND METHODS

The research method implied two parallel items:

- Intraoral clinical examination
- Applying the GC Plaque Indicator Kit as a new working instrument on institutionalized children. (7)

A descriptive investigation study has been conducted, using as tools the muco-bacterial plaque revealer and the assisted questionnaire, applied to a group of school-aged children between 8-10 years old from a care home in Sibiu.

The study was conducted over the period 2016-2017, during which we have clinically examined 46 children of 2nd and 3rd grade, aged 8-10.

Following the clinical examination, the individual study sheet, as shown in fig. 3, was prepared with the following data: name, surname, age, sex, frequency of brushing, type of brush, person who does the brushing, presence /absence of muco-bacterial plaque, tartar, gingivitis, number of fillings, cavities, root debris. The children were examined during the internship hours at the University Dental Center of Sibiu, with sterile and disposable instruments. We have tested the muco-bacterial plaque with the specific GC Plaque Indicator Kit, and the children were encouraged to brush their teeth with the available brushes and tooth paste, while the brushing techniques were being explained to them. At the end of the examination we elaborated a centralizing data sheet with the help of the coordinator of ARAPAMESU foundation. The number of carious lesions at the moment of examination was noted down. The parents / the personnel from the care homes were to be informed on the highlighted problems in the hope of increasing the dentist addressability.

CASE REPORT

Patient P.M, 12 years-old female, living in the urban area, pupil, non-smoking, comes at the University Dental Center of Sibiu for examination and instruction on correct brushing techniques.

The clinical consultation and the endo-oral exam revealed the following:

- Poor oral hygiene;
- Old bacterial plaque covering more than 1/3 of the clinical teeth crown;
- Multiple untreated carious lesions, root debris, tartar.

After the clinical exam, we have applied the steps of the test of the GC Plaque Indicator Kit:

- We collected muco-bacterial plaque (figure no. 1).
- We immersed the collected plaque for one second in substance A (figure no. 2).

[1]Corresponding author: Alina Cristian, Str. Iuliu Maniu, Nr. 2, Sibiu, România, E-mail:alina_cristian24@yahoo.com, Phone: +400727786461
Article received on 08.09.2017 and accepted for publication on 04.12.2017
ACTA MEDICA TRANSILVANICA December 2017;22(4):119-123

Figure no. 1. Collecting bacterial plaque

Figure no. 2. One-second immersion in substance A

- We introduced the sampling stick with muco-bacterial plaque in substance B (figure no. 3).
- When checking the color on the sampling stick and comparing it to the scale on the plate we have noticed the presence of pH of 7.1. (figure no. 4).
- Next, the bacterial plaque revealing gel was applied into another cup (figure no. 5), and with the help of an applicator we have colored all the dental surfaces (figure no. 6).
- In figure no 6, it is shown the coloration of the muco-bacterial plaque after rinsing:
  - More than 72 hours-old muco-bacterial plaque – blue.
  - Less than 24 hours-old muco-bacterial plaque – pink.
- The child has been trained on brushing techniques and helped to properly sanitize the oral cavity (figures no. 7,8).
- In figure no. 8, one can observe the final appearance of the dental surfaces after removal of the muco-bacterial plaque.

Figure no. 3. Two-second immersion in substance B

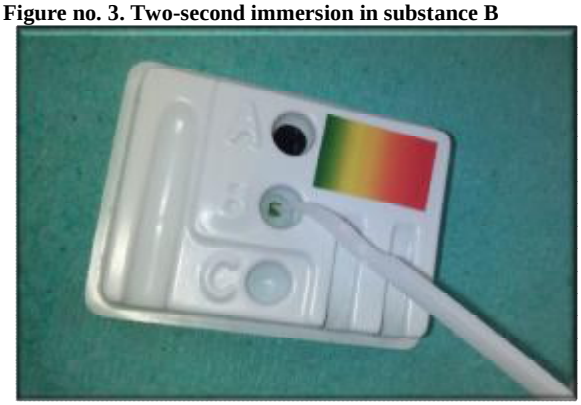


Figure no. 4. Color checking, neutral pH of 7,1

Figure no. 5. Revealing gel

Figure no. 6. Applying the gel to the dental vestibular surfaces of the incisors and canines

Figure no. 7. Aspect of coloration: blue old plaque

Figure no. 8. Final aspect after sanitizing

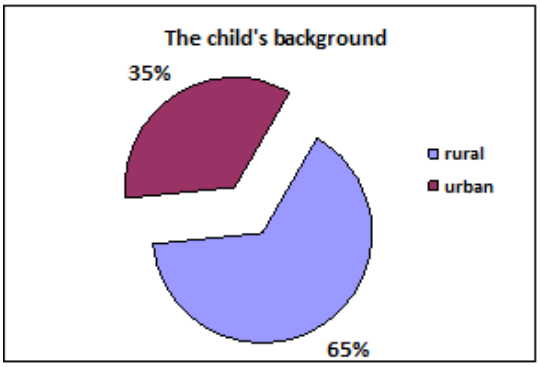
In this case, the suggested treatment plan would be:

1. Sanitation of oral cavity.
2. Removal of old fillings.
3. Removal of carious lesions.
4. Professional brushing
5. Training the patient on a correct brushing technique.
6. Using chlorhexidine 0.12% mouthwash twice a day.

DISCUSSIONS

Table and figure no. 1. The child's background

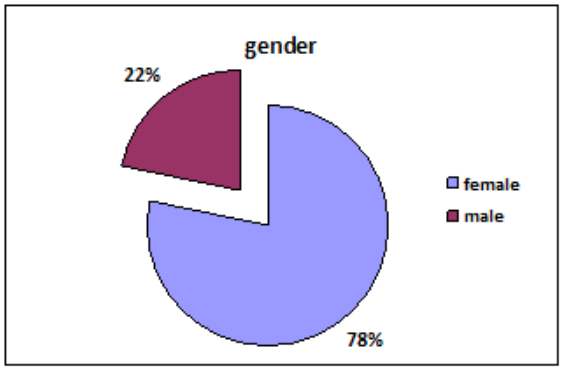
Background	Urban	Rural
Number of patients	30	16



The number of patients in rural areas is lower than the number of urban patients

Table and figure no. 2. The incidence of examined children according to gender

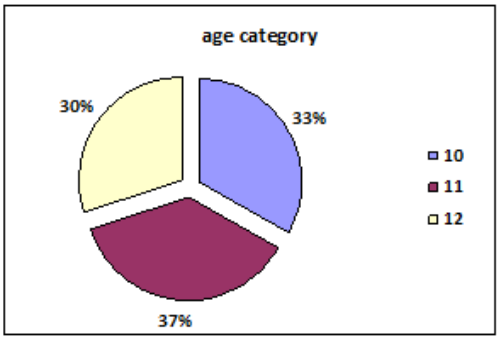
Gender	Number of patients
Female	**36**
Male	**10**



The study was conducted on a number of 46 children, where the female presence dominates over the males.

Table and figure no. 3. Predominance of examined children according to age

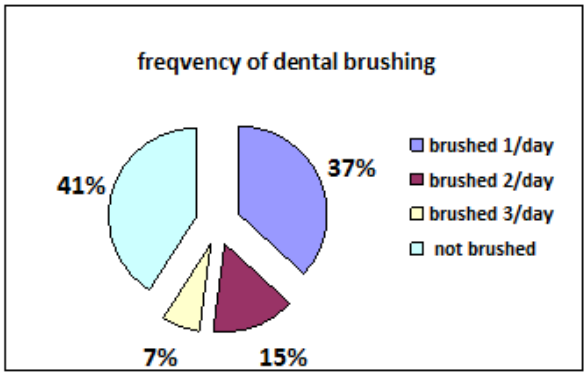
Age category	Number of patients
10	15
11	17
12	14



The majority of examined children fall into the category of 10 to 12 years old.

Table and figure no. 4. Frequency of dental brushing

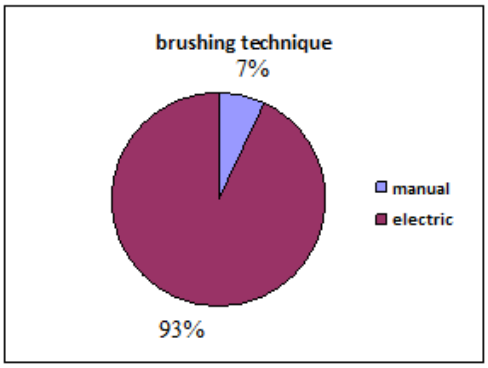
	Brushed			
Oral hygiene	**1/day**	**2/day**	**3/day**	**Not brushed**
No of patients	**17**	**7**	**3**	**19**



The study shows a majority percentage of patients with poor hygiene (brushed once a day) and low hygiene with those that do not brush their teeth.

Table and figure no. 5. Brushing technique

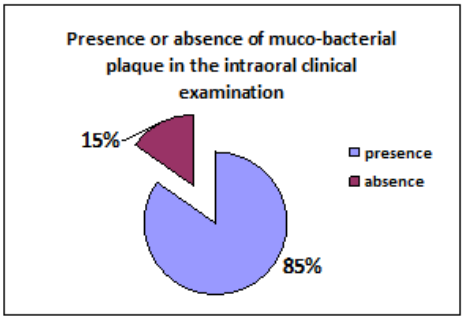
Brushing technique	Manual	Electric
Number of patients	**25**	**2**



Following the study of patients performing dental brushing, it was found that hand brushing techniques are much higher than electric brushing.

Table and figure no. 6. Presence or absence of muco-bacterial plaque in the intraoral clinical examination

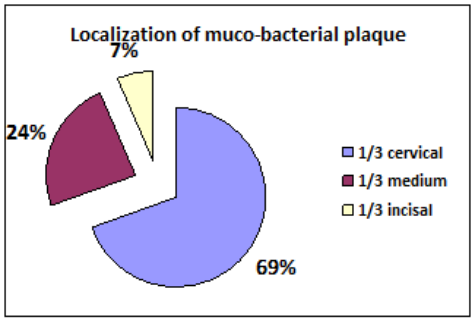
Muco-bacterial plaque	Presence	Absence
Number of patients	39	7



The study demonstrates that oral hygiene is deficient, due to the presence of the bacterial plaque in a fairly high percentage (85%).

Table and figure no. 7. Localization of muco-bacterial plaque

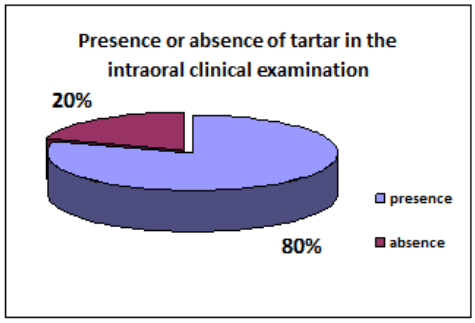
Localization of muco-bacterial plaque	1/3 cervical	1/3 medium	1/3 incisal
Number of patients	32	11	3



The results obtained from the endooral clinical examination on a group of 46 children reveal a localization of the muco-bacterial plaque in the highest proportion of 70% in 1/3 of the cervical dental surface.

Table and figure no. 8. Presence or absence of tartar in the intraoral clinical examination

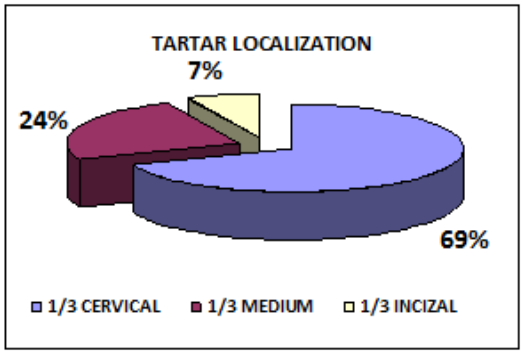
Tartar	Presence	Absence
Number of patients	37	9



The studies during the clinical exam reveal a high percentage of tartar presence of dental surface.

Table and figure no. 9. Tartar localization on dental surface

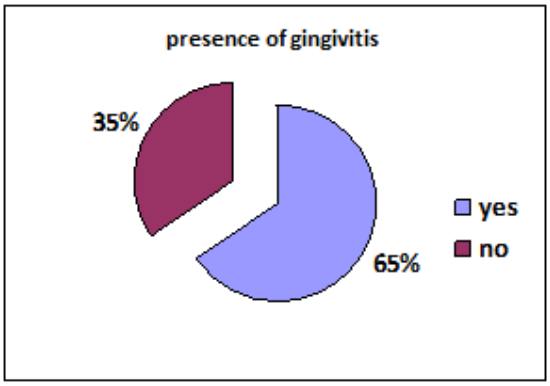
Tartar localization	1/3 cervical	1/3 medium	1/3 incisal
Number of patients	34	11	1



Following the studies, a localization of the tartar was found in a high percentage at the level of 1/3 cervical.

Table and figure no. 10. Presence of gingivitis in the studied group of children

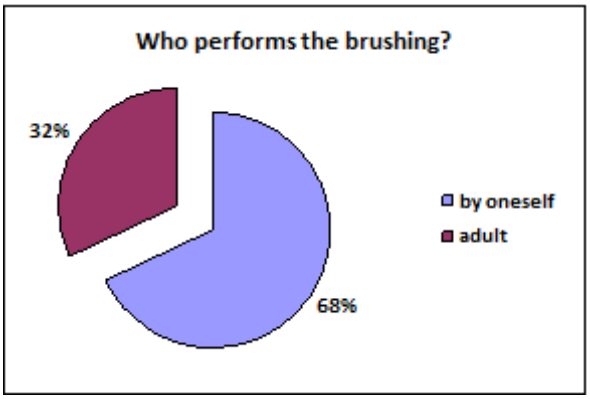
Presence of gingivitis	Yes	No
Number of patients	30	16



The aftermath shows a 65% in favour of the presence of gingivitis.

Table and figure no. 11. Who performs the brushing?

Who performs the brushing?	By oneself	Adult
Number of patients	15	7



The figure illustrates that 68% of the children brush their teeth by themselves.

Table and figure no. 12. Presence of tooth decay

Presence of tooth decay	Dental cavities	No dental cavities
Number of patients	32	14

The study revealed a high percentage of 70% regarding the presence of dental cavities in the group of examined children.

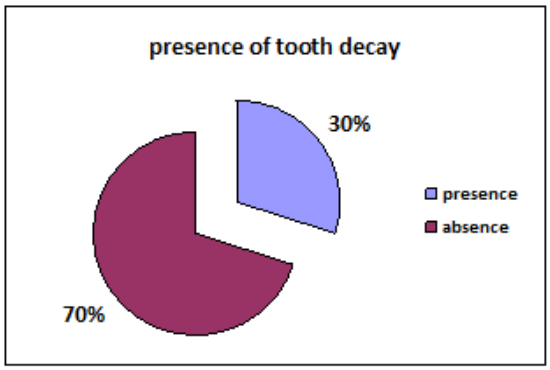
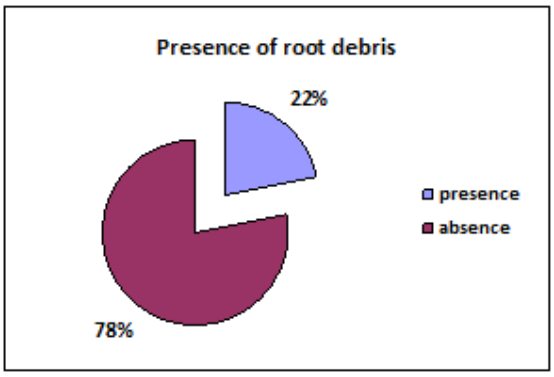


Table and figure no. 13. Presence of root debris

Presence of root debris	With root debris	No root debris
Number of patients	36	10



The results following the intraoral clinical examination reveal a 78% presence of root debris.

Table and figure no. 14. Depth of dental caries

Depth of caries	Superficial	Medium	Deep
Number of patients	7	15	10

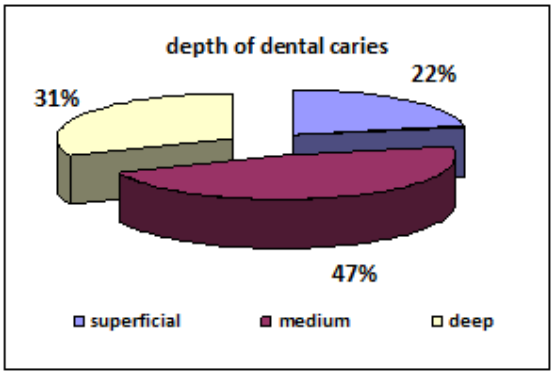


Figure no 14 shows that in 47% of the children the depth of the caries is medium.

CONCLUSIONS

- The study certifies an accumulation of muco-bacterial plaque in a fairly high percentage of 85%
- At the initial exam, the location of the bacterial plaque has a prevalence of 70% in 1/3 of the cervical, 24% in the 1/3 medium and 6% in the 1/3 incisal.
- Regarding the brushing method, in most cases there is a frequent use of the manual method (93%).
- The study shows a majority percentage of patients with poor hygiene-that brush 1 /day, which reveals a minimal concern over the maintenance of oral hygiene.
- The studies following the clinical examinations showed a high percentage of 74 % regarding the tartar localization at the1/3 cervical level.
- Lack of regular and correct oral-dental hygiene leads to the incidence of gingivitis in a very large number of children (30 from o group of 46).
- Dental hygiene is more effective in children brushed by an adult, i.e. bacterial plaque and tartar are less pronounced and carious lesions are smaller, unlike children who wash themselves.

Unfortunately, 70% of cases present carious lesions, which mean that there is a much higher percentage of children performing brushing by themselves than of adults helping them to brush (68%). 47% of the carious lesions have a medium depth.

REFERENCES

1. Pan S, Liu Y, Zhang L, Li S, Zhang Y, Liu J, Xiao S. Profiling of subgingival plaque biofilm microbiota in adolescents after completion of orthodontic therapy. PloS one,. 2017;12(2):e0171550.
2. Aas JA, Griffen AL, Dardis SR, Lee AM, Olsen I, Dewhirst FE. Bacteria of dental caries in primary and permanent teeth in children and young adults. J Clin Microbiol. 2008;46:1407-1417. Crossref, Medline.
3. Pitts NB, Zero DT, Marsh PD, Ekstrand K, Weintraub JA, Ramos-Gomez F, Ismail A. Dental caries. Nature reviews. Disease primers. 2017;3:17030.
4. Corby PM, Lyons-Weiler J, Bretz WA, Hart TC, Aas JA, Boumenna T, Microbial risk indicators of early childhood caries. J Clin Microbiol. 2005;43:5753-5759.
5. Kumar S, Kroon J, Lalloo R, Kulkarni S, Johnson NW. Relationship between body mass index and dental caries in children, and the influence of socio-economic status. International dental journal. 2017;67(2):91-97.
6. Plaka K, Ravindra K, Mor S, Gauba K. Risk factors and prevalence of dental fluorosis and dental caries in school children of North India. Environmental monitoring and assessment. 2017;189(1):40.
7. Flaherman VJ, Epstein J, Amendola L, Inge R, Featherstone JD, Okumura M. Preventive Dental Care at 6-Month Intervals Is Associated With Reduced Caries Risk. Clinical Pediatrics; 2017, 0009922817691823.