



Research Paper

Clinical Characteristics of Caries Lesions D1 And D2 After Non-Invasive Treatment with Varnish

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ABSTRACT

Background: Suitable for non-operative / non-invasive treatment are the majority of caries pathology in childhood - reversible caries lesions reported with new index systems / diagnostic threshold, activity indices and caries lesion reversibility indexes / at the earliest possible stage From their appearance, including temporary dentition.

Objective: Assess the effectiveness of remineralization of Clinpro White Varnish applied to reversible, active caries lesions and surfaces by diagnosis based on laser fluorescence.

Material and Methods: Subject of the monitoring are 200 children from Varna, aged 3 to 6 years, divided equally in age standardized groups with an equal number of boys and girls.

Criteria for inclusion of children: clinically healthy, without general and systemic diseases without gingival and oral mucosal diseases; accompanied by their parents, regularly visiting our ambulatory room. Patients were divided into two groups of 100 children.

Methodology: Applications with varnish are at the beginning of treatment, and replications every 3 months - for a period of one year. The children are randomly selected to visit the Clinical Halls of the Faculty of Dental Medicine, Varna for prevention and treatment.

Results: Comparing the groups of children on healthy enamel surfaces / d1 caries lesions $t = 2,869$, $p < 0,05$ we found a statistically significant difference. When comparing the groups of children on healthy enamel surfaces / d2 caries lesions $t = 9,494$, $p < 0,05$ we found a statistically significant difference. When comparing the groups of children with caries lesions d1 / d2 ($t = 2.456$, $p > 0.05$) we did not detect a statistically significant difference.

Conclusion: After the first week, DIAGNOdent pen scores decrease from the baseline to less than three degrees for d1b and d2 and decrease by two degrees for d1a lesions.

Keywords: caries lesions, varnish, non-invasive treatment, DIAGNOdent Pen

I. INTRODUCTION

Suitable for non-operative / non-invasive treatment are the majority of caries pathology in childhood - reversible caries lesions reported with new index systems / diagnostic threshold, activity indices and caries lesion reversibility indexes / at the earliest possible stage From their appearance, including temporary dentition [1]. The indicated pathway for the management of the carious process is to increase the resistance of solid dental tissues before the occurrence of the defects, by fluorinating remineralizing agents or curative prophylaxis of the existing carious lesions [3,4,9]. This opportunity was provided by modern diagnostic tools based on laser fluorescence [5,6,7,8].

Objective: Assess the effectiveness of remineralization of Clinpro White Varnish applied to reversible, active caries lesions and surfaces by diagnosis based on laser fluorescence.

II. MATERIAL AND METHODS

Caries status

Study location: The survey is conducted in:

1. Faculty of Dental Medicine - Clinical Halls of DDM, Varna.

2. University Medical Center, FDM - Varna.

3. The study is authorized by the Scientific Research Ethics Commission of the Medical University of Varna and informed consent of each parent, respectively for each child-patient, is made.

Subject of the monitoring are 200 children from Varna, aged 3 to 6 years, divided equally in age standardized groups with an equal number of boys and girls.

Criteria for inclusion of children: clinically healthy, without general and systemic diseases without gingival and oral mucosal diseases; accompanied by their parents, regularly visiting our ambulatory room. Patients were divided into two groups of 100 children.

Methodology: Applications with varnish are at the beginning of treatment, and replications every 3 months - for a period of one year. The children are randomly selected to visit the Clinical Halls of the Faculty of Dental Medicine, Varna for prevention and treatment.

The experimental group In the clinical study to measure the healing effect of Clinpro White Varnish with TCP (3M) for 12 months with DIAGNOdent Pen, we included 100 children. Children are at high risk of caries and regularly visit our clinic. In the control group, we included 100 children of the same age who did not have any non-operative treatment with Clinpro White Varnish and / or fluoride medications. The duration of the study is 12 months. A dental status is assessed and registered by the WHO criteria.

Units of observation: deciduous teeth and surfaces with/without carious lesions, active carious lesions at the level of a diagnostic threshold level d1a.

Diagnostic Scale – codes:

d1a - white enamel lesion, visible with drying

d1b - white enamel lesions visible without drying

d2 - white enamel cavitated lesion

d3+d4 - dentin lesion with and without affecting the pulp

A - active (d1b, d2)

NA - inactive (d1b, d2)

Reversible carious lesions - (d1a, d1b, d2)

Irreversible carious lesions - d3 and d4

The examinations at the beginning and every three months up to the twelfth month inclusive were conducted by the pediatric dentist specialist. Results were scored on teeth and surfaces. Before we performed the clinical application of fluoride varnish, we applied diagnostics by laser fluorescence, and the measurements were performed with DIAGNOdent Pen.

Statistics: After processing the results and determining the highlights, the actual study was carried out by processing the data with a mathematical statistical processing suite SPSS v 20.0.

III. RESULTS

Comparative analysis (Student's t-criterion) of the d1a, d1b and d2 values of the children studied in DIAGNOdent Pen groups (Figure 1). Comparing the groups of children on healthy enamel surfaces / d1 caries lesions $t = 2,869$, $p < 0,05$ we found a statistically significant difference.

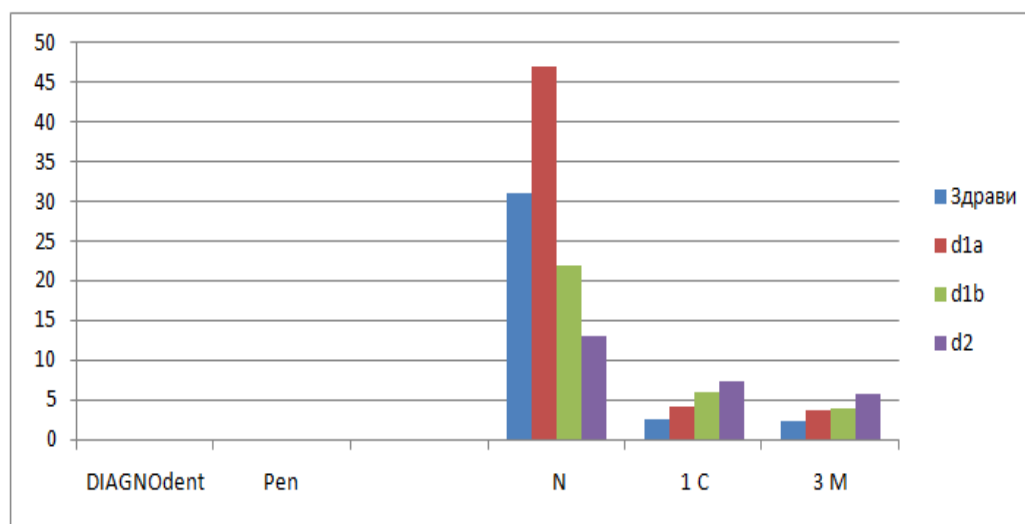


Figure 1. The laser fluorescence of healthy (blue) active lesions d1 (red and green) and d2 (violet) on surfaces after 1C (week), 3M (months) of non-invasive treatment with Clinpro White Varnish

The results of the comparative analysis show that there was a significant difference in the mean value of lesions d1b before and after treatment with CV varnish in children for 1C (week), 1M (month) 3,6,9 and 12 months of the age groups considered. We received the following results for the 4th year old children. Pre-treatment values were 2.7-fold higher, with the median pre-treatment lesions at 11.35 ± 2.41 ($t = 12.43$, $p < 0.001$). In the 5 and 6-year-old children, the difference before and after treatment was 2.6 times the median pre-treatment lesion at 5 years old was 11.25 ± 2.47 and 6 years at 11.15 ± 2.23 $t = 12.01$, $p < 0.001$ for 5 years and $t = 12.93$, $p < 0.001$ for 6 years).

The values in mm of the carious lesions d2 in the study period for 1C (week), 1M (month), 3M (months) is shown in Figure 2.

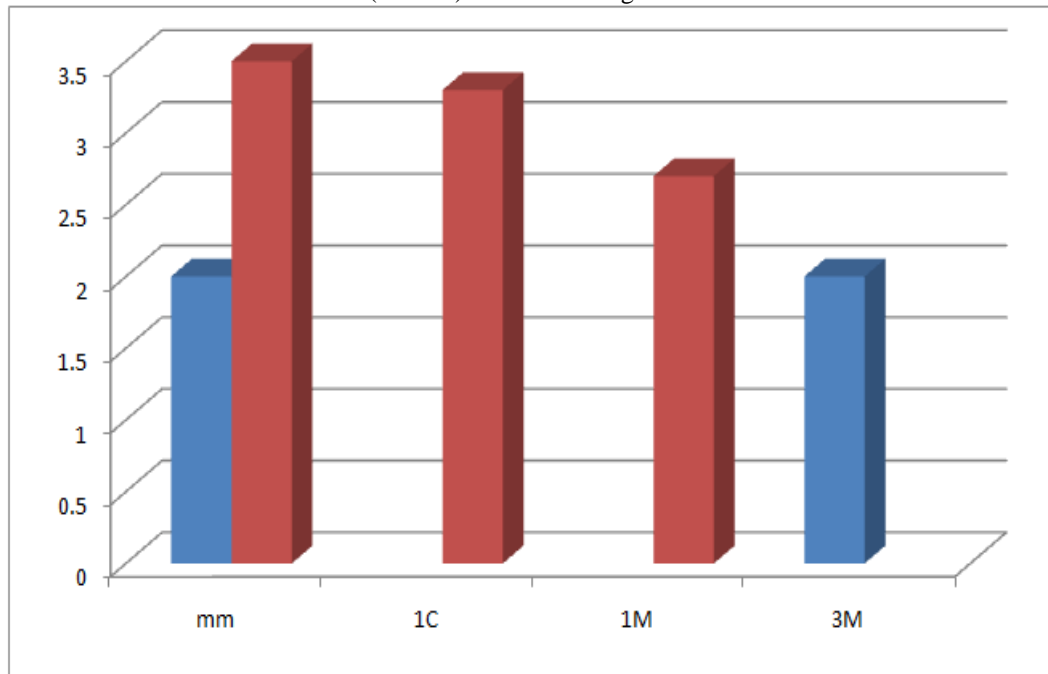


Figure 2. Values in mm of the carious lesions d2 in the study period for 1C (week), 1M (month), 3M (months)

When comparing the groups of children on healthy enamel surfaces / d2 caries lesions $t = 9.494$, $p < 0.05$ we found a statistically significant difference. When comparing the groups of children with caries lesions d1 / d2 ($t = 2.456$, $p > 0.05$) we did not detect a statistically significant difference.

IV. DISCUSSION

Comparing the groups of children on healthy enamel surfaces / d1 or d2 caries lesions we found a statistically significant difference. Dental caries is the most common chronic disease of childhood. Twenty-four percent of US children 2 to 4 years of age, 53% of children 6 to 8 years of age, and 56% of 15-year-olds have caries experience (dmf/t) [1,10]. Charlotte W. Lewis believes that healthy temporary teeth are a prerequisite for healthy permanent teeth or temporary dentition predisposes healthy teeth for life [2,11].

V. CONCLUSION

1. After the first week, DIAGNOdent pen scores decrease from the baseline to less than three degrees for d1b and d2 and decrease by two degrees for d1a lesions.
2. According to the clinical study, it can be concluded that changes in the degree of remineralization of the temporary teeth can be obtained with DIAGNOdent Pen.

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