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IMPACT OF FLUORIDE ON DENTAL HEALTH QUALITY

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ABSTRACT

Introduction: Fluoride is natural element that strengthens teeth and prevents their decay. Experts believe that the best way to prevent cavities is the use of fluoride from multiple sources. Studies even show that in some cases, fluoride can stop already started damage of the teeth. In children younger than 6 years fluoride is incorporated into the enamel of permanent teeth, making the teeth more resistant to the action of bacterial and acids in food. **Goal:** The aim of this study is to determine the effects of improving the health status of teeth after six months treatment with the use of topical fluoridation 0.5% NaF, and the level and quality of the impact of treatment with chemical 0.5% NaF on the dental health of children at age from 8 to 15 years, in relation to gender and chronological age. This study included school children aged 8 to 15 years who visited health and dental services dependent in Mostar. **Results:** It is obvious that after the implementation of treatment with 5% NaF by the method of topical fluoridation, health status of subjects from the experimental group significantly improved, so that at the final review 89.71% or 61 subjects of the experimental group had healthy (cured teeth), tooth with dental caries only 5.88% or 4 respondents tooth with dental caries and filling 4.41% or 3 respondents, extracted baby tooth 14.71% or 10 respondents, while for 13.24% of respondents was identified state with still unerupted teeth. Our findings are indirectly confirmed that the six-month treatment of fluoridation with 5% NaF, contributed to statistically significant improvement in overall oral health of the experimental group compared to the control group which was not treated by any dental treatment. **Conclusion:** It can be concluded that there is a statistically significant difference in the evaluated parameters of oral health of children in the control group compared to the studied parameters of oral health the experimental group of children at the final dental examination. **Key words: Fluoride, dental health status, children.**

1. INTRODUCTION

Fluoride is a natural element that strengthens teeth and prevents their deterioration. Experts believe that the best way to prevent cavities is use of fluoride from multiple sources. Fluoride in small amounts naturally occurring water sources and it can be found in foods such as meat, fish, eggs and tea (1).

In certain areas fluorine is added to the drinking water. Many toothpastes, mouthwashes and professional dental treatments contain fluoride. Fluorine tablets are prescribed to children who does not drink fluoridated water. Research on the effects of fluoride on oral health began more than hundred years ago. At first research has focused on the ratio of fluoride in water and caries. In the second half of the twentieth century the subject of research around the world was the exogenous administration of fluoride. The use of fluoride in caries prevention is simple and suitable for mass preventive programs. At the same time, massive use of fluoride in preventive dentistry cause of very violent and controversial reactions and often unfounded resistance. Anticariogenic fluoride effect is the result of a cumulative effect of a number of different mechanisms. They can act on the surface of the teeth or directly affect the mineral phase in enamel (2,3).

Fluoride, in its compounds represent a normal component of tooth enamel and bone, while it even can be found in some plants. It is the most negative charged element, and therefore the most reactive with the strongest oxidizing action which binds to almost all other chemical elements. The use of fluoride in improving oral health has long been known and documented in many scientific papers. Every study has shown at least a small positive effects of fluoride. So its extraordinary effect on tooth structure cannot be hidden (4).

Fluoride prevents tooth decay by making the enamel more resistant to the action of acids. They and accelerate the buildup of healthy minerals in the enamel, further

slowing the occurrence of decay. Studies even show that in some cases, fluoride can stop already started teeth decay. In children younger than 6 years fluoride is incorporated into the enamel of permanent teeth, making the teeth more resistant to the action of bacterial and acids from foods (5).

2. GOAL

The aim of this study is to determine the effects on the teeth health status after six months of treatment with the use of topical fluoridation with 0.5% NaF, as well as the level and quality of the treatment with chemical 0.5% NaF impact on the dental health of children aged 8 to 15 years, in relation to gender and chronological age.

3. MATERIAL AND METHODS

This study included school children aged 8 to 15 years, users of health and dental services of the regional ambulance MZ "Zalik" in Mostar. The study included a total of 108 subjects, divided in two subgroups according to the following:

The first sub sample consisted of children, 68 of them (34 girls and 34 boys) who were treated with six months therapy NaF 0.5% (five percent sodium fluoride).

The second sub sample consisted of children, 40 of them (20 girls and 20 boys), followed for several factors (or children who are in need of treatment but will not apply any kind of therapy and treatment, besides use of different products in dental hygiene).

In this study, according to the topic, the problem and the aim of research, were followed the following indicators: The variables to assess the general status of the mouth (8 variables); The variables to assess the general condition of the teeth (4 variables); The variables for determining the status of dental caries (5 variables).

DMFT-index (the sum of the numbers decayed, extracted and filled teeth) is a very good indicator of oral health.

3.1. Statistical analysis

Research results were statistically analyzed by software package SPSS 17. In order to provide more complete answers to set goals, the processing of data collected throughout the course of the research, carried out through three phases and statistical methods: The first phase is done by tabular and graphical representation of frequency distribution: the study sample, in relation to gender and chronological age, the results of the studied parameters related to the general status of the mouth, teeth and general status of health of the teeth, with special emphasis on the presence status of dental caries in the entire study sample, the initial and final diagnostic dental exam. The second phase was carried out comparison of the status of teeth in relation to its age and gender with the help of calculated values (DMFT -index), for both investigated groups (control and experimental). In the third stage of the analysis is done to determine the statistical significance of differences obtained values of characters, the health status of teeth and the same was done by Pearson chi-square test.

4. RESULTS

Tables 1 and 2 present the summary frequency distribution of the sample in chronological age and gender with a percentage share.

		Frequency	Percent
Valid	8-10 years	38	35,18
	11-12 years	41	37,97
	13-15 years	29	26.85
	Total	108	100,00

Table 1. Frequency distribution of the sample by chronological age

		Frequency	Percent
Valid	Girls	54	50,0
	Boys	54	50,0
	Total	108	100,0

Table 2. Frequency distribution within sample with respect to gender

	Dental status	Frequency	Percent %
Valid	Dental status	68	100,00
	Healthy teeth	61	89,71
	Cariotic teeth	4	05,88
	Cariotic teeth with filling	3	04,41
	Extracted baby tooth	10	14,71
	Non erupted teeth	9	13,24

Table 3. Frequency distribution of the studied parameters for assessing the health of the teeth in the experimental group of respondents–final Review

Looking at Table no. 3, it is evident that after the implementation of treatment with 5% NaF by the method of topical fluoridation, dental health status of the experimental group significantly improved, so that at the final review 89.71% or 61 subjects of the experimental group had healthy (cured teeth), tooth with dental caries 5.88% or 4 respondents; tooth with dental caries and filling 4.41% or 3 respondents; extracted tooth 14.71%, or 10 respondents, while for 13.24% of respondents was identified state with unerupted teeth. It is evident that the treatment has not been fully completed in 7 patients (4 with dental caries and 3 patients with dental caries and filling), which is essentially caused and continue their treatment with this method to complete healing.

	Dental status	Frequency	Percent %
Valid	Dental status	40	100,00
	Healthy teeth	0	00,00
	Cariotic teeth	24	60,00
	Cariotic teeth with filling	5	12,50
	Extracted baby tooth	3	07,50
	Non erupted teeth	8	20,00

Table 4. Frequency distribution of the studied parameters to assess the health status of teeth in the control group of subjects–the final Review

Table no. 4, shows the results of frequency distribution data of the health status of teeth and the same is evident that in none of the control group the teeth are not healthy, even more, there was a deterioration in the overall health status of teeth. 60% of respondents, or 24 of them have bad teeth with dental caries, 20% or 8 subjects in the control group did not have all teeth emerged, with 12.50% of the respondents, or 5 of them finding shows dental caries with filling, while at 7.50%, or 3 the control group has taken out dairy tooth.

GROUPS	Control group	Experimental group	P*

DMFT	7.13	8.01	0.317

Table 5. Differences in DMFT index between investigated groups at the initial examination. *Chi-square test

After examining the results obtained by DMFT index on the initial examination in order to determine initial (current) health status of teeth in the studied group, we can conclude that on the basis of the results obtained by Chi-square test, the same statistically indistinguishable. DMFT index for the control group at the start (initial diagnostic survey) is 7.13, and the experimental group of respondents of the same value is 8.01. The result applied chi-square test was p = 0.317, which indicates that there is no statistically significant difference in the health status of teeth in the studied group compared to the values obtained DMFT.

GROUPS	Control group	Experimental group	P*
DMFT	6.51	9.12	0.017

Table 6. Differences between DMFT index of studied groups at the final review. *Chi-square test

After examining the results, chi-square test, the obtained values of DMFT index between investigated groups at final review, we conclude that the value of DMFT investigated groups of respondents differ significantly. DMFT index for the control group at the final (final) diagnostic survey is 6.51, and the experimental group of respondents of the same value is 9.12. Confirmation of statistical significance of differences DMFT value the health status of teeth between the experimental group of respondents represents the calculated value of Chi-square test, which is p = 0.017.

5. DISCUSSION

The term oral health is very complex and comprehensive concept, which includes a number of parameters which essentially define and determine oral health. We also mentioned that according to the World Health Organization (WHO) in 1965, oral health is essentially a "Condition of healthy and functioning teeth and their supporting structures, including the health of all parts of the oral cavity involved in chewing". For this study, we clearly and unambiguously seen and proved that only chewing function is not only in preserving oral and overall health status and human health, there are aesthetics and phonics (6).

The wider issue of this study, in the sense to estimate the quality of general health status of oral health and to assess the status of representation of dental caries in relation to sex and chronological age by determining the degree of influence of the use of certain methods in the treatment of dental caries in different age and gender categories (Table 7).

So the main problem of this study was to investigate the possibility of improving the quality of general dental health status by the treatment with 0.5% NaF, in children aged 8–15 years, with the application of methods of topical fluoridation.

For the purpose of this survey selected is a sample of school children aged 8 to 15 who use medical and dental services of regional ambulance MZ "Zalik" in Mostar. The study included 108 subjects, divided into two sub-samples (control group of 40 subjects and experimental group of 68 subjects).

The control group consisted of children in whom was followed multiple factors (children who have a need for dental treatment, but the same was not apply, except for regular controls and tips for self-hygiene and the use of various protective preparations in dental hygiene. The experimental group consisted of children who are was involved in the six-month treatment of topical therapy fluoridation NaF 0.5% (five percent sodium fluoride).

Results of obtained general descriptive indicators of the teeth health status in the total number of respondents are presented in tables and graphs the frequency distribution of values of the parameters under the health status of teeth and the same is clearly observable differences in the values of the studied parameters and the initial and final dental examination. As we have mentioned earlier DMFT index represents the sum of the number of decayed, extracted and teeth with fillings, and as such is both a very good indicator of oral health (7,8). In the analysis of the obtained data investigated parameters to assess oral health it is determined DMFT index and for the control and experimental group of subjects at the initial and final dental examination.

This mini research aimed to investigate the studied sample population, the effects of the application of methods fluoridation on dental health status of children from 8 to 15 years, and that we obtain certain information and guidance in caries prevalence as well as the assessment of the presence or homogeneity within the studied population. Awareness of various socioeconomic condition of the company in our country, are very important for the general idea of dental caries in children and early adolescence. It has been shown that countries in transition have the highest value DMFT-index, and in such a reorganization of our country.

Unemployment, inflation, low family income, lack resolved hygienic sanitation facilities life, primarily inadequate housing conditions without basic hygiene, poor diet, low level of health awareness among parents, as well as the growing privatization of the dental profession, represent the main external risk factors which favor the emergence and spread of decay within the most vulnerable population of children transition period of growing permanent teeth and falling dairy teeth (9,10).

Compound	APPROX-IMATE % F	ACTUAL % F	F PPM	FORM	RECCOM-ENDED USE
0.05% NaF	0.025	0.023	230	Mouthwash	Daily
0.20% NaF	0.1	0.091	910	Mouthwash	
0.243% NaF	0.12	0.1	1000	Tooth paste	Daily
0.76% NaMFP	0.095	0.1	1000	Tooth paste	Daily
0.4% SnF 2	0.1	0.097	1000	Tooth paste; gel	Daily
1.1% NaF	0.55	0.5	5000	Tooth paste; gel	Daily
0.5% APF	0.5	0.5	5000	Gel	Daily
2.0% NaF	1	0.9	9040	Gel	Professional
1.23% APF	1.23	1.23	12300	Gel	Professional
8% SnF 2	2	1.94	20000	Gel	Professional
5% NaF	2.5	2.26	22600	Gel	Professional
0.1% difluorid silan				Laque	Professional

Table 7. Concentrations of selected agents for topical application

So the results of this mini-survey will not be able to use as a scientific, exact population indicator, but be sure that we will reach a very important knowledge about the effects of the application of methods of fluoridation, its duration, which in practice will give one particular contribution to improving health care quality status teeth within the studied population.

6. CONCLUSION

Our findings indirectly confirmed that the six-month treatment with 5% NaF, contributed to statistically significant improvement in overall oral health of the experimental group compared to the control group which was not treated by any dental treatment.

We can conclude that there is a statistically significant difference in the evaluated oral health parameters of children in the control group compared to the studied parameters of oral health in the experimental group of children at the final dental examination.

Also we conclude that there is a statistically significant difference in average values of DMFT index between the observed two groups.

CONFLICT OF INTEREST: NONE DECLARED.

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