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Monitoring of changes in biophysical studies of oral fluids and oral health in children of primary school age with multiple caries after secondary prevention

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Summary: The problem of prevention of dental caries, despite the considerable number of domestic and foreign publications, today remains the relevant. To compare the study oral fluid performance and condition of oral hygiene during treatment and secondary prevention of investigated young students with multiple cavities separated into groups: basic (41 people) and relative (37 people) of CPV ≥ 10 . Using techniques developed multiple secondary prevention of dental caries in primary school children contributed significantly to the improvement of health and condition of the oral cavity.

Key words: children, caries, oral health, primary, school.

Actuality. The problem of prevention of dental caries, despite the considerable number of domestic and foreign publications [3, 6, 7], today remains the relevant. This is supported by considerable intensity and prevalence of caries in the population [4,5]. Attention is drawn to development of multiple cavities, especially in children of primary school age, according to the authors [1, 5, 6, 10, 11], due to age-related changes in lifestyle associated with adaptation to the school and the negative impact of external and internal environment. Among the important factors that promote the development of multiple dental caries, is the state of oral health and the qualitative and quantitative composition of the oral fluid, because of them formed an environment in which teeth constantly functioning. In this connection, during a set of preventive measures should include measures aimed at the normalization of the mouth state. For this purpose, prescribe calcium adaptogens, symbiotyks, homeopathic remedies [1, 2, 5, 6, 9]. The scheme, which maximize the impact on the basic pathogenesis of multiple dental caries and includes preparations (application of preparations "Biokosmovit plus", "Enerion", "Inulin", "Symbilakt VIVO») and without medical prevention (strengthening physical health and oral hygiene).

The purpose of research is to study the dynamics of changes in oral hygiene and the results of biophysical studies of oral fluid in primary school children with multiple cavities in the process of secondary prevention.

Material and methods. To compare the study oral fluid performance and condition of oral hygiene during treatment and secondary prevention of investigated young students with multiple cavities separated into groups: basic (41 people) and relative (37 people) of CPV ≥ 10 . The control group consisted of 41 children of a similar age without multiple caries (CPV $\leq 4,9$). After dental health among children of

the main group was carried out the complex secondary prevention. It consisted of two components - the medicinal and no medicinal prevention. Medicinal prevention include: preparations "Biokosmovit plus" for 1 capsule after a meal twice a day for two months (to improve the mineralization of hard tissue of teeth) ; "Enerion" on the 1 tablet twice a day for 4th weeks (to correct psycho-vegetative syndrome); "Inulin" on the 1 tablet three times a day for a month (microecological to restore balance and improving oral salivation) "Symbilakt VIVO» - always as dairy products (for recovery symbiotic flora of the mouth); physiotherapy - carbonic bath for 5 minutes - 20 procedures (to correct sympathicotonia) ; psychotherapy that includes group disputes and role-playing games with the development of complex exercises autogenous training for the Schulz in 1932 [8,9] and use «Remin Pro» VOCO, Germany as applications once a day for a month (to improve the mineralization of hard tissues teeth) . For oral hygiene to children of the main group was appointed toothpaste that contains fluoride and calcium carbonate "Maximum protection against tooth decay," and picked up a toothbrush Curaprox 5460, Switzerland.

The complex of developed method of multiple secondary prevention of dental caries in schoolchildren included measures without medicinal prevention: the normalization of the daily routine, work and rest, good nutrition, sports. The developed technique of multiple secondary prevention of caries in children used the main group three times a year.

Schoolchildren of comparative group after the sanitation of oral cavity was administered multivitamin and multimineralnyy complex "Calcinova" on the 1tablet four times a day for two months, three times a year. The preparation contains: vitamin B6 - 0.4 mg Vitamin A - 1000 IU vitamin D3 - 100 IU, vitamin C 15 mg, calcium hydrogen phosphate dihydrate (corresponding to 100 mg of calcium

and phosphorus 77 mg in one tablet). In order to improve mineralization of hard tissues of the teenagers multiple applications caries performed 10% solution of calcium gluconate 15 minutes for 10 days, then the application of 2% sodium fluoride solution for 5 minutes for 10 days.

For realization of hygienic measures, children of comparative group were using toothpaste "Mint freshness" and universal toothbrush company "Colgat."

Children in the control group were held only oral sanitation of without imposing preventive measures. Assessment of the hygienic condition of the mouth conducted through a simplified index Green_Vermilion -OHI_S (1964) [9]. Clinical evaluation of resistance to tooth decay and multiple remineralizade ability of saliva (KOShRE test) were conducted by the method of T. Relinovoyita. (1982) [2]. Evaluation of mineralizade potential of saliva, the recommendation HM Saifullin [6], expressed in a generalized score based on types of crystallization: 0,0-1,0 - very low; 1,1-2,0 - low; 2,1-3,0 - satisfactory; 3,1-4,0 - high; 4,1-5,0 - very high. Determination of the viscosity of the mixed non-stimulated saliva was carried out by Oswald viscometer [6]. Determination of the pH of oral fluid test was performed by Saliva Check. Oral fluid buffer capacity was determined by Krasse [2]. Bicarbonate buffer capacity evaluation was performed as follows: pH> 6 - high capacity buffer 5 <pH <6,0 - normal, pH <5 - low. Statistical analysis of the results of research conducted by t Student's test.

Results and discussion. In carrying out prevention all the studied parameters of the main group and the comparison group were identical and were not significantly differed ($P > 0.05$). After prophylactic course the average values of the experimental group were significantly better compared to baseline. Application developed a set of preventive measures contributed to a significant

improvement of the hygienic condition of the oral cavity. Thus, in the main group Green_Vermilion index was $0,93 \pm 0,08$ (against $1,97 \pm 0,11$), which was significantly lower than for prevention ($P_2 < 0.001$), and corresponds to satisfactory evaluation of hygienic condition of the oral cavity. In analyzing the state of oral health of children in the comparison group found a slight nonsignificant decrease in OHI-S, indicating the low efficiency of the traditional method of multiple prevention of dental caries in this group of patients. Equally important in maintaining homeostasis of the oral cavity with the activity of the salivary glands and saliva secretion in nature [2, 6]. The definition of this indicator in the main group of teenagers after the course of prevention revealed a significant increase in salivation from $0,31 \pm 0,01$ to $0,44 \pm 0,01$ ($P_2 < 0.001$). In addition, the concentration of hydrogen ions was $6,64 \pm 0,06$ (against $6,23 \pm 0,05$ at $P_2 < 0.001$). Markedly improved neutralizing buffer properties of oral liquid and its viscosity (from $4,68 \pm 0,05$ to $5,22 \pm 0,08$ and $1,84 \pm 0,08$ to $1,34 \pm 0,02$ at $P_2 < 0.001$). Children comparative group after the course prevention indicator values that define the dynamic equilibrium of metabolic processes in the mouth, almost unchanged. Thus, the rate of secretion of saliva mixed to prevention was $0,35 \pm 0,01$, buffer capacity - $4,64 \pm 0,05$, pH - $6,4 \pm 0,06$; viscosity - $1,78 \pm 0,08$; after prophylaxis - respectively $0,4 \pm 0,02$; $4,78 \pm 0,05$; $6,42 \pm 0,07$; $1,56 \pm 0,08$; with less than acceptable in medical research authenticity difference indicators ($R_2 > 0.05$). It is known that the stability of dental caries depends on susceptibility of enamel to acids and remineralizuyuchoyi ability of oral fluid [2, 3, 6]. After a course of preventive figure solubility of tooth enamel in children of the main group was $39,76 \pm 1,46$; and the rate of remineralization of enamel - $3,87 \pm 0,16$; reliability that 99.9% differed from those of

the original. At the same time, despite holding conventional prevention in the comparison group of children studied sustainability indicators teeth to the caries process remained low and not significantly different from the initial ($R_2 > 0.05$). Under the influence of caries and preventive measures in the research group of younger pupils indicator micro crystallization of saliva changed from $1,37 \pm 0,08$ to $2,47 \pm 0,13$ ($P_2 < 0.001$). On increasing the capacity of saliva mineralize indicated that the experimental group increased 1.5 times and the number of children with type micro crystallization and twice with type II. At the same time among the comparative group recorded 1.6 times more children with type III, most unfavorable type of microcrystals and 1.4 times less than with type II, and the rate has not changed mikrokystalizatsiyi ($1,34 \pm 0,08$ - for the prevention, $1,37 \pm 0,09$ - after at $P_2 > 0.05$).

It should be noted that after the secondary prevention of multiple caries the proposed methodology research results of basic biophysical parameters and the state of oral health in the experimental group patients reached values of "pure" control (indicators remineralizuyuchoyi ability saliva pH and compliance enamel against acids) significantly improved (speed salivation, buffer capacity of saliva, and saliva mikrokystalizatsiya oral hygiene) and significantly decreased viscosity of saliva and increased salivation rate compared to placebo.

Remark : P - significant difference between the basic indicators and the comparison group for the prevention; P1 - significant difference between the basic indicators and the comparison group after prevention; P2 - significant difference in performance in the study group and a comparison group before and after prevention; P3 -dostovirnist performance difference between the main and control group and between comparative and control groups after prevention.

Conclusion. So using techniques developed multiple secondary prevention of dental caries in primary school children contributed significantly to the improvement of health and condition of the oral cavity. High efficiency of the developed method confirmed

significant improvement in acid base status of the mouth, improving the structural properties of the mixed saliva significant influence in its buffer and mineralize properties, the rate of salivation to ensure the implementation of its key features.

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