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PREVALENCE AND INTENSITY OF CARIES IN CHILDREN OF PRESCHOOL AGE OF TASHKENT REGION AND ITS SYSTEMIC PREVENTION

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Abstract: In work the analysis of results of studying of prevalence and intensity of caries at children is provided in preschool educational institutions of Almazarsky district of Tashkent aged from 3 up to 6 years and also the assessment of efficiency of its system prevention fluorine is carried out by the containing water. As a result of researches the following types of localization and also feature of defeat are established by caries: a) the greatest prevalence of caries is noted at children 5-6 summer age (81.3±2.54%), the smallest (67.7±2.42%) - among children of 3-4 years; в) by localization, Black II class cavities predominate; c) the defeat of molars prevails; d) the depth of the lesion is dominated by mean caries; e) by the structure of caries damage "K" prevails, which causes high need of children for dental care. System fluorine prevention of caries with use of the containing water bottled fluorine "Aqua dental" among children in preschool educational institutions promotes reliable positive improvement of a condition of quality of oral liquid including the hygienic index both in the 1st, and in the 2nd preventive groups of children. In particular, it has been established that systemic fluorine prevention of caries in children leads to: a) an increase in the rate of salivation of saliva from 13.95 to 20.05%; b) to decrease in indicators of viscosity of saliva from 12.58 to 13.13%; c) increase of oral fluid pH medium from 6.23 to 6.50%, and d) decrease of HI from 12.30 to 17.76%. Developed by BFW "Aqua dental", it is recommended for effective use in systemic fluorine prevention of caries in organized preschool collectives.

Keywords: children, tooth caries, prevalence, intensity, fluorine prevention, oral fluid, saliva viscosity, pH saliva, hygienic index.

Introduction

Caries of teeth at early children's age is extremely active form of the disease leading to destruction of temporary teeth at children from first years of life. In three years at children 3-4 teeth and as a result are affected on average, the number of heavy complications increases. Carrying out a set of scientific and scientific and practical research in the world obtained important data on identification and elimination of etiological risk factors of a disease as: caries susceptibility of a tooth surface; cariogenic bacteria; the fermented carbohydrates; hygiene of an oral cavity; balanced diet, environment of the region, etc. [1,3,9,12,14,17,21,23]. The high prevalence and the increasing

intensity of damage of children's caries and also low level of hygiene of an oral cavity at children puts forward a problem of their prevention in number of the most relevant [3,4,8,10,13,15, 24]. According to the last years, the high dental incidence in the Republic of Uzbekistan can cause a loss to the state of health of younger generation [1,4,7,10].

Theoretical bases of preventive actions of caries are based on timely providing conditions for high-quality and quantitative process of a mineralization of enamel of teeth at children's age [2,5,14,16]. Therefore, in prevention of caries at children the actions directed to mechanisms of stimulation of processes of a mineralization and maturing of enamel of tooth by realization of appointment in the main components of enamel - calcium, phosphorus, fluorides and also substances providing their exchange and inclusion in fabrics of a matrix of enamel and dentine are leading [2,8,10-13,16,18,20]. It should be noted that the scheduled maintenance and programs which are carried out so far led to positive shifts in a solution of the problem of children's caries, however this pathology remains one of the most often found diseases of early children's age [10-15].

Prevention of caries at children has to be directed to creation of optimal conditions for maturing of enamel of tooth and, increase in its resistance [15,16,18,19]. The most expressed effect of prevention of caries is observed at optimum intake of fluorine in an organism during development, a mineralization and the subsequent maturing of teeth, that is at children's age [11,14,15,18,20] since fluorine is one of the main components representing a mineral basis of solid tissues of teeth. Almost all fluorine in an organism (99%) is localized in solid fabrics. At the normal content of fluorine in an organism it provides formation (mineralization) of a bone tissue, a dentin and enamel of teeth [3,14-16,18,20,25]. Therefore, for a full-fledged odontosis, especially during the periods of active growth of a dentoalveolar system when processes of primary mineralization are not finished yet, a role fluorine of prevention of caries continues to occupy with fluorinated water one of the leading places. In this plan for the population of our republic, especially, for children of preschool age, system fluorine of prevention can be used by an important alternative method the butylated fluorinated water (BFW) as fluoration of tap drinking water at us completely is absent, and fluoration of milk and salt is not adjusted yet. Therefore, for a full-fledged odontosis, especially during the periods of active growth of a dentoalveolar system when processes of primary mineralization are not finished yet, a role fluorine of prevention of caries continues to occupy with fluorinated water one of the leading places. In this plan for the population of our republic, especially, for children of preschool age, system fluorine of prevention can be used by an important alternative method the containing water (BFW) bottled fluorine as fluoration of tap drinking water at us completely is absent, and fluoration of milk and salt is not adjusted yet.

The purpose of the real work – the analysis of the received results of studying of prevalence and intensity of defeat by caries of teeth at children aged from 3 till 6 flyings, which are in preschool educational institutions of Almazarsky district of Tashkent and assessment of efficiency system their fluorine of prevention.

Materials and methods. An object of a research were preschool children 3-6 summer age i.e. children of preschool educational institutions No. 68 and No. 509 of Almazarsky district of Tashkent. In total 380 children were examined. Inspection was performed with use of disposable dental sets at natural lighting. Studied information from their medical records. All examined children were distributed on 4 age groups: 1 group - at the age of three years (74 persons); 2 group - at the age of four years (138 people); 3 group - at the age of five years (106 people) and 4 group - at the age of six years (62 persons). Studied intensity of caries of teeth by the "rc, rc+KPU " index.

For carrying out system fluorine of prevention of caries of teeth of children the butylated fluorinated water (BFW) us together with technologists of LLC "RIKKO TRADE", for the first time, developed structure and "The technology instruction" for its production (TI 25097940-02:2014). BFW on organoleptic indicators conforms to requirements of QzDSt 540, transparent, without foreign smell and smack and on microbiological indicators it conforms to requirements of GOST 18963. For the purpose of purposeful and safe use of BFW in prevention and fluorine of

prevention of children's caries in preschool educational institution us was its toxicological researches with fluorine content in concentration (0.7 - 1.0) mg/l in experiments on animals, in particular, of rats are conducted.Toxicological researches were conducted in vivariums of the Interuniversity Research Laboratory (IRL) of the Tashkent Medical Academy (TMA). By the received results of toxicological researches it is concluded that for safe use of BFV at fluorine to prevention of caries both on individual, and on social levels of the population optimum concentration of fluorine 0.7 and 1.0 of mg/l in it is. Therefore, in our work of BFW with concentration of fluorine of 1.0 mg/l it was used for fluorine of prevention of caries at preschool children.

For inclusion in the program system fluorine of prevention of caries among the examined children with carious teeth, with various extent of defeat were selected. They were divided into 4 groups, on 12 children in everyone. Children of age of 3-4 years and the second - children of age of 5-6 years which under control used BFW during the day entered into the first group. Control children of age of 3-4 years and the fourth - control children of age of 5-6 years which used usual boiled water entered into the third group. For studying of a state and properties of oral liquid at children of preschool age before and after fluorine of prevention we studied the speed of secretion of saliva (SSS), viscosity, change pH - environments of oral liquid and also the level of hygiene of an oral cavity at children. SSS determined by the method - T.L. Redinova and A.R. Pozdeev (1994), and the viscosity of saliva was investigated by means of the capillary VK-4 viscometer and expressed in relative units. The pH value (pH) of oral liquid was determined by EV-74 ionomer in accordance with GOST 8.135-74. Level of hygiene of an oral cavity at DDV was determined by Fedorov-Volodkina's index.

Results and discussion: The prevalence of caries of teeth among children of 3-6 years of Almazarsky district of Tashkent averages 75.1%, at intensity 3.8. Children, intact on caries, there were 24.9%. According to the obtained data, indicators of average prevalence and intensity of caries of teeth at children in general that corresponds on the republic. The prevalence of caries of teeth on groups was: 1 group - 67.7±2.42; The 2nd group - 73.8±1.75; The 3rd group - the 77.3±2.21 and 4 group - 81.3±2.54% (tab. 1). Follows from these data that at 1 group of children the prevalence is rather lower, than in other groups, but by 5-6 years, at these children caries more than 80% of teeth are surprised. It demonstrates that they observe high degree of prevalence of caries of teeth. The analysis of intensity of caries of temporary teeth showed that in 1 group of the examined children the level of intensity can be regarded as low (rc+ KPU - 2.42±0.35), and in the second and third group of children the intensity of caries has average degree and is 3.75±0.21 and 4.38±0.29 (tab. 1). Follows from these data that degree of intensity of caries of teeth of children increases with age, and further comes to a high mark, i.e. GI indicator by 6 years reaches high degree (5.14±0.41).

Table 1.

Indicators of prevalence and intensity of caries at children

Indicators	**Group of the examined children**			
	1 group (n=74)	the 2nd group (n=138)	the 3rd group (n=106)	the 4th group (n=62)
Prevalence of caries, %	67,7±2,42	73,8±1,75	77,3±2,21	81,3±2,54
Intensity "rc, rc+ KPU "	2,42±0,35	3,75±0,21	4,38±0,29	5,14±0,41

Studying of localization of damage of temporary teeth showed that in a temporary bite at children more than others teeth of the upper jaw in comparison with mandible teeth are surprised caries, and in a constant bite teeth of the upper and lower jaws are surprised caries almost equally.

So, during researches at the examined children carried out the classification of carious cavities by localization offered by Blek. Localization of carious cavities at children was observed on all classes with the prevailing majority in the I-III classes. In particular, it was established: The I class - 63.1; The II class - 78.5; The III class - 45.1; The IV class - 15.0 and the V class - 10.5%.

In the analysis of defeat by caries of various groups of teeth depending on group accessory of teeth it is revealed that at a temporary and constant bite caries painters at all examined children on age groups (tab. 2) considerably are surprised. To a lesser extent premolar tooths and cutters are surprised, and canines are surprised much less often. The analysis of defeat by caries of various surfaces of teeth showed that at temporary teeth at children the aproksimalny surface most often is surprised. The second in defeat caries at them the chewing surface stands still. In the mixed bite teeth top and a mandible caries were surprised equally. Conducted also researches on distribution of number of the carious and sealed-up teeth and depth of defeat by caries of teeth on all age. When studying the rc + KPU index on groups the prevalence almost twice, the number of carious teeth, in comparison with the sealed-up teeth was revealed. By studying of depth of defeat by caries of teeth it was established that at the examined children superficial caries generally is observed, and fissure met quite seldom.

Table 2.

Structure of defeat by caries of teeth on groups, %.

Group of children	Canines	Molyara's	Cutters
1 group	2,7	38,8	50,7
2 group	8,3	65,9	75,4
3 group	8,9	68,4	87,3
4 group	9,3	57,8	88,4

Thus, from the conducted researches it is concluded that the incidence of caries at the examined children is estimated as "high": a) the greatest prevalence of caries of teeth is noted among 5-6 summer children and is 80.42±2.33% at intensity 4.83±0.03; b) the smallest prevalence of caries of teeth is noted among 3-4 summer children and is 72.13±2.21% at intensity. It is shown that at preschool children the following types of localization, feature and structure of defeat have caries of teeth: a) on localization cavities on the II class Blek prevail; b) defeat of painters prevails; c) on feature of defeat by caries average caries prevails; d) on structure of defeat by caries prevails "K". It is shown that the hygienic index at 3-4 summer examined children makes 2.56±0.03 and it is estimated as "the unsatisfactory index", at 5-6 summer children makes 3.36±0.03 and it is regarded as "the bad index" of hygiene that causes high needs of children in the dental help.

In work for studying of change of a state and properties of oral liquid at preschool children before system prevention we studied SSS, viscosity, change of acidity of oral liquid and also level of hygiene of an oral cavity at children. The SSS oral liquid at the children of control group (3-4 years) consuming usual boiled water averages 0.43 ± 0.01 ml/min. At consumption by preschool children of BFW the tendency to increase in the SSS oral liquid appeared: after 2 monthly periods in the 1st group of children the size of an indicator increased to 0.48 ± 0.02 ml/min. ($p < 0.05$), and after 4 monthly performing prevention of caries of BFW - up to 0.49 ± 0.04 ml/min. that was reliable above ($p < 0.01$), than at the children using usual boiled water. If to transfer these indicators to percent, then it is possible to conclude that the 2nd monthly prevention of caries of BFW brings to reliable improvement of quality of oral liquid, i.e. indicators of SSS after the 2nd and 4th months increase by 11.62 and 13.95% respectively (tab. 3). Similar increase in indicators of SSS is observed also in the second preventive group of children. It was established that in the 2nd control group of children (children of 5-6 years) size SSS was slightly lower, than in the 1st preventive

group of children. It was 0.39 ± 0.02 ml/min. After 2 monthly prevention at children of the 2nd preventive group the size of an indicator SSS increased to 0.44 ± 0.02 ml/min., and after 4 monthly performing prevention of caries of BFW - up to 0.47 ± 0.02 ml/min. respectively that was reliable below (p <0.001), than at children of control groups. In particular, it has been established that systemic fluorine prevention of caries in

Table 3

Physical and chemical indices of oral fluid properties of 1-group of children

Indicators	Timing of the survey				
	Control group	After 2 months	Deviat. from contr,%	After 4 months	Deviat. from contr,%
SSS, ml/min	0,43±0,01	0,48±0,02	11,62	0,49±0,04	13,95
Viscosity, relative unit	1,37±0,02	1,23±0,04	10,21	1,19±0,03	13,13
pH	6,15±0,03	6,49±0,02	5,52	6,55±0,04	6,50
GI	2,52±0,04	2,27±0,05	9,92	2,21±0,05	12,30

children leads to an increase in the rate of salivation of saliva from 13.95 to 20.05%.

Exchange processes in enamels of teeth, the moistened viscous saliva, slow down processes of diffusion of ions of mineral substances of oral liquid, in this regard conditions for development of caries are created. Therefore, us was change of viscosity of oral liquid is studied. Follows from the results of a research received by us that the viscosity of oral liquid at the children of control group (3-4 years) consuming usual boiled water averages 1.37 0.02 relative unit. The use of BFW leads to reduction of viscosity of oral liquid: after the 2nd monthly prevention of caries of BFW the size of an indicator decreased to 1.23±0.04 relative unit (p <0.05), and after 4 monthly performing prevention of caries of BFW - to 1.19±0.03 relative unit that was reliable below (p <0.01), than at the children using usual boiled water. If to transfer these indicators to percent, then it is possible to conclude that the 2nd monthly prevention of caries of BFW brings to reliable improvement of viscosity, i.e. qualities of oral liquid. There was a positive increase of 11.62 and 13.95%, respectively, in the viscosity index after 2 and 4 months of examination. A similar decrease in absolute viscosity values is observed in the 2nd group of children. It was established that in 2-oh to control group at children (children of 5-6 years) the viscosity was slightly higher, than in the 1st preventive group of children. It was 1.43 ± 0.03 relative unit (tab. 4). After 2 monthly inspections of children of the 2nd preventive group the viscosity of oral liquid decreased up to 1.28 ± 0.05 relative unit, and after 4 monthly performing prevention - to 1.25 ± 0.03 relative unit respectively that was reliable below (p <0.01), than at children of control groups. It is established that prevention of caries of BFW gives 2 and 4 monthly fluorine to reliable improvement of quality of oral liquid, i.e. positive lowering of indicators of viscosity after the 2nd and 4th months of inspection is observed. If to express these indicators as a percentage, efficiency of prevention increase by 11.62 and 13.95% respectively. The results received by us, concerning studying of viscosity of saliva of children of preschool educational institution, well are confirmed with literary data [6,11,15,17]. In general it is established that system fluorine prevention of caries at children gives to decrease in indicators of viscosity of saliva from 12.58 to 13.13%. At the same time the direct correlation dependence between viscosity of saliva of children and intensity of carious process is established [6,14,15].

Table 4

Physical and chemical indices of oral fluid properties of 2-group of children

Indicators	Timing of the survey				
	Control group	After 2 months	Deviat. from contr.,%	After 4 months	Deviat. from contr.,%
SSS, ml/min	0,39±0,02	0,44±0,03	12.82	0,47±0,02	20,05
Viscosity, relative unit	1,43±0,03	1,28±0,05	10,48	1,25±0,03	12,58
pH	6,09±0,05	6,27±0,03	4,56	6,47±0,06	6,23
GI	3,38±0,05	2,85±0,04	13,10	2,70±0,04	17,76

Studying of change of concentration of hydrogen ions (pH) in oral liquid of children of preschool educational institution under the influence of prevention of caries of teeth of BFW showed that pH in oral liquid of children before introduction fluorine of prevention of caries of teeth at children of 1 group (3-4 years) mattered 6.15±0.03. Consumption of BFV by children within 2 months led to reliable increase pH up to 6.49±0.02 ($p < 0.001$), i.e. the indicator pH increased by 5.52%, and in 4 months fluorine of prevention raised up to 6.50%, in comparison with similar indicators of the children receiving usual boiled water. In general, systemic fluorine prevention of caries in children increases the pH environment of oral fluid from 6.23 to 6.50%. Here it should be noted, that since the pH of the oral fluid medium plays a role in diffusion and osmosis, dispersion of colloidal solutions, their adsorption, change of the boundary potential of membranes, etc., the increase in pH, even insignificant, contributes to better mineralization of the enamel of temporary teeth.

These results were consistent with our examination of the oral hygiene index in the children examined. From the results of the study, it follows that in children of the 1st control group (3-4 years old) consuming ordinary boiled water, the oral GI averaged 2.52 ± 0.04. Prevention of BFW leads fluorine to significant reduction of GI of an oral cavity: after 2 monthly periods in the 1st group of children the size of an indicator decreased up to 2.27±0.05 ($p < 0.05$), and after 4 monthly prevention of caries of BFW - up to 2.21±0.05 that was reliable below ($p < 0.01$), than at the children using usual boiled water. It should be noted that the 2nd monthly prevention of caries of BFW brings to positive improvement of quality of an oral cavity, i.e. oral cavity GI indicators after the 2nd and 4th months increase by 9.92 and 12.30% respectively. Similar increase in indicators of GI of an oral cavity is observed also in the 2nd preventive group of children. It was established that in the 2nd control group of children (children of 5-6 years) the size GI of an oral cavity was slightly higher, than in the 1st preventive group of children. It made 3.28±0.02 ml/min. After 2 monthly prevention at children of the 2nd preventive group the size of an indicator of GI of a cavity decreased up to 2.85±0.04, and after 4 monthly - up to 2.70±0.04 respectively that was reliable below ($p < 0.001$), than at children of control groups. At the same time, it has been found that systemic fluorine prevention of caries in children leads to a decrease in the GI index from 12.30 to 17.76%. Since children of both groups (control and prophylactic) were treated in a single volume, and children of the control group did not consume BFW, a reliable improvement in the quality of oral fluid in children of the prophylactic group seems to be the result of fluorinated water. Thus, on the basis of the conducted researches on prevalence and intensity of children's caries and its system prevention important conclusions are drawn.

Conclusions: The prevalence, intensity, localization, feature and structure of defeat is for the first time estimated by caries of teeth of children of age of 3-6 years visiting the preschool educational institutions located in Almazarsky district of Tashkent. It is established that the incidence of caries at the examined children divided on age into groups is estimated as "high": a) the greatest prevalence of caries of teeth is noted among 5-6 summer children and is 80.42±2.33%

at intensity 4.83±0.03; b) the smallest prevalence of caries of teeth is noted among 3-4 summer children and is 72.13±2.21% at intensity. It is shown that at preschool children the following types of localization, feature and structure of defeat have caries of teeth: a) on localization cavities on the II class Blek prevail; b) defeat of painters prevails; c) on feature of defeat by caries average caries prevails; d) on structure of defeat by caries prevails "K" that causes high needs of children in the dental help. It is shown that the hygienic index at 3-4 summer examined children makes 2.56±0.03 and it is estimated as "the unsatisfactory index", at 5-6 summer children makes 3.36±0.03 and it is regarded as "the bad index" of hygiene.

Considering carrying out system prevention fluorine at children of preschool age, for the purpose of prevention of caries of teeth, for the first time, in the conditions of our republic the structure is developed and BFW "Aqua dental", with the optimum content of fluorine is released. It is established that system fluorine prevention of caries both in the 1st, and in the 2nd preventive groups of children with use of BFV promotes reliable positive improvement of a condition of quality of oral liquid and also the hygienic index. In particular, system prevention of children's caries to give fluorine: - to increase in speed of a sialosis of saliva of children of the first group from 11.62 to 13.95%, and the second from 12.82 to 20.05%; - to lowering of viscosity of saliva of children of the first group from 10.21 to 13.13%, and the second from 10.48 to 12.80%; - to increase in the rn-environment of oral liquid of children of the first group from 5.52 to 6.50%, and the second from 4.56 to 6.23% and also reduction of the hygienic index of children of the first group from 9.92 to 12.30%, and the second from 13.10 to 17.76%.

Thus, the contrast improvement of indicators of oral liquid, a condition of an oral cavity and also the hygienic index established in work will promote, naturally, reduction of risk of development of children's caries and costs of its treatment. Consequently, the "Aqua dental" BFW can be recommended for the successful prevention of child caries in organized children's collectives.

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