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STATE OF DENTAL HEALTH OF CHILDREN IN UZHGOROD AND THE WAY OF THEIR NUTRITION

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ABSTRACT

The aim: To study and evaluate the condition of the dental health of children of school age and the characteristics of their food.

Materials and methods: Statistics on the dental health of children in Transcarpathian region for the years 2009–2018 were analyzed with the application of statistical, sociological and clinical methods and the data on dental health and way of nutrition of 163 children in Uzhgorod were determined and analyzed.

Results and conclusions: Reduction of 28.9% of coverage of children with preventive dental examinations was determined with the need for mouth cavity sanitation of 45.93%. Redevelopment was held for 91.7% of those who needed help.

From 10% to 50% of the examined children in different age groups have caries. Up to 10% of children between 11 and 15 years old have teeth removed. It was determined that nutrition of children with caries diagnosed is not rational.

KEY WORDS: children, caries, nutrition, stomatological care

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INTRODUCTION

In modern ecological and socio – economic conditions, there is an increase in the incidence of children whose organism is sensitive to harmful factors. One of the integrated indicators of the health of the pediatric population is dental morbidity. The condition of the oral cavity of the baby has a major impact on overall health. At this stage, the dental health of Ukraine's child population is worsening every year and is characterized by a high prevalence of caries. Studies have shown a significant prevalence of dental caries in children at different ages [1, 2, 3, 4].

On average, children in school age have 3-4 permanent teeth, and at the time of graduation, one in five children has one permanent tooth removed. The incidence of periodontal disease is also increasing rapidly [5]. This is due to the peculiarities of the structure of nutrition, the level of hygienic skills, the effectiveness of remedial measures, including fluoroprophylaxis [6].

Monitoring of dental health of children and adolescents of different regions of Transcarpathian region has shown that the condition of the oral cavity in children of all age groups is satisfactory, but there is a risk of periodontal diseases [7,8,9,10]. Identical studies were conducted in Uzhgorod [11].

One of the important factors affecting the dental health of children is the nature of their diet. According to publications in the nature of nutrition of the infant population of Ukraine, over the last two decades, there have been negative changes, and the deterioration of the structure of productive diets of children, their imbalance by major nutrients [12].

The study of the prevalence of dental diseases in the pediatric population and their relationship with nutrition is at the heart of rational nutrition and dental care planning. Correct nutrition plays an important role in preventing caries. This issue should be considered in two aspects: 1) the indirect influence of nutrients through the formation of organs and systems (including the tooth-jaw apparatus) and 2) the direct effect of food on the tissues of the tooth and periodontal. The state of the solid tissues of the tooth, the pH of saliva and plaque, the rate of tartar deposition, and the stimulation of salivation, depend on the nature of the food. The tooth is a semipermeable membrane, the permeability of which depends on the physicochemical features of the surrounding media. That is, a certain orientation of the metabolic processes, which contributes to carious tooth damage [13].

An important component of a person's diet are macro-, micro-, and ultramicroelements that provide remineralization of tooth enamel. Therefore, one of the directions of prevention of demineralization of enamel (reverse process) and related complications is to balance the content of chemical elements in food. Particularly important among macronutrients are compounds of calcium and phosphorus. Among the trace elements of food, ions of aluminum, copper, zinc, iron, manganese and tin promote the incorporation and retention of calcium and fluorine in enamel and inhibit the production of acids by plaque [14,15].

Studies have been conducted that indicate a direct correlation between the consumption of easily digestible carbohydrates and the intensity of caries development [16].

Carbohydrate intake is an important etiological factor in the development of caries. . An abundance of fast food, poor quality, high sugar and simple carbohydrate-based diets in lower income neighborhoods predispose children to the development of plaque, dental decay and caries [17,18]. In the prevention of caries a special place belongs to vitamins, which are found mainly in fresh vegetables and fruits [19].

THE AIM

To study and evaluate the dental health status of school children and the nutritional status of these children.

MATERIALS AND METHODS

The study was based on WHO recommendations for dental examination [20], using modern methodological approaches to conducting preventive dental examinations [21, 22].

According to WHO recommendations, the following levels of caries intensity are distinguished: 0-1.1% – very low, 1.2-2.6% low, 2.7-4.4% average, 4.5-6.5% high, 6.6% or more is very high. And also the following degrees of caries prevalence: 0-30% – low, 31-80% – average, 81-100% – high prevalence.

The study was conducted in Uzhhorod in March – June 2019.

The following methods were used in the study:

- statistic: for the purpose of analyzing statistics of preventive examinations of the child population of Transcarpathian region, including in Uzhgorod, for 2009 – 2018. Data of sectoral statistical reports for the specified period were used as the materials of the research;
- sociological: in order to conduct a survey, according to a specially designed questionnaire, to study the way of feeding children. In total, 400 questionnaires of sociological study were handled;
- clinical: preventive dental examination of school-age children. Observation data were recorded in the oral examination charts in children. The prevalence, intensity, and the degree of caries compensation, the increase / reduction of the caries intensity, were used to evaluate dental caries. The surveyed children were divided by gender and age group. The total number of surveyed and conducted preventive dental examination of 163 children of middle and high school age in Uzhgorod: 9 years – 30 (18,4%), 10 years – 33 (20,2%), 11 years 32 (19,6%), 12 years – 38 (23.4%), 15 years – 30 (18.4%). Of the total number of examined children 48.3% were boys and 51.7% – girls. General population amounted to 10526 children of appropriate age residing in Uzhhorod.

Statistical analysis of the obtained data was carried out using special packages of application statistics Microsoft office EXCEL.

RESULTS AND DISCUSSION

At the beginning of the study, the statistical results of dental preventive examinations of the pediatric population of

the Transcarpathian region, including Uzhgorod, for the period 2009 – 2018 were analyzed.

It is established that every year the number of children covered by preventive examinations in the region decreases. Thus, in 2018 the number of children covered by preventive dental examinations was 7.1% lower than in 2009. The same tendency is found in Uzhgorod, where in 2009 there were 19282 children undergoing preventive dental examinations and 13706 children in 2018: 5576 fewer children. At the same time, the share of the pediatric population covered by preventive dental examinations decreased from 79.97% to 60.22%: by 19.75% less.

It should be noted that during the specified period in the region the share of children requiring rehabilitation increased by 25.84%. In Uzhgorod, per 1,000 children surveyed, the proportion of those requiring rehabilitation decreased from 730.03 in 2009 to 459.35 in 2018, representing 62.92% of the 2009 figure.

Remediation of the oral cavity in 2009 and 2018, respectively, was carried out in 90.57% and 91.70% of those who needed it.

To evaluate the prevalence of multiple dental caries and the nature of nutrition, dental examination and questioning of 163 children were conducted among which boys were 48.3% and girls – 51.7%.

Tooth involvement by caries process was evaluated on the basis of the following indicators: caries prevalence (in%), caries intensity (CPV – caries, filling, removed (refers to permanent teeth) and CPV + kp, CP – caries, filling, removed (related).

Determined the condition of the teeth using a standard dental tool kit – noted the presence of carious cavities and their localization, the presence of complicated caries, removed teeth, the condition of the fillings, secondary caries, the presence of dental deposits.

Figure 1 shows the results of the distribution of children according to the evaluation of oral hygiene

The data in Fig. 1 indicate that there was a mild plaque in all the children who were examined, but the level was different. The highest level of mild plaque was found in children aged 15 and 10 years, which was 90.0% and 73%, respectively. And the lowest level was found in children aged 11 and 12 years – 28.0% and 31.5% respectively.

Solid plaque was detected in children aged 12 and 15 years – 10.5% and 20.0%, respectively.

The next step in the study was to study the presence of temporary and permanent tooth decay in children. The obtained data are shown in Fig. 2.

The analysis given in Fig. 2. The data indicates that all of the children examined had permanent teeth affected by caries. The highest level of permanent tooth impression was observed in children aged 12 and 9 years: 50.0% and 40.0%, respectively, and the lowest in children 10 and 11 years – 18.0% and 19.0%, respectively.

Temporary teeth affected by caries in children 9 and 12 years: 10.0% and 10.5%, respectively.

The results of the study on the intensity of caries of temporary and permanent teeth in the examined children are presented in Fig. 3.

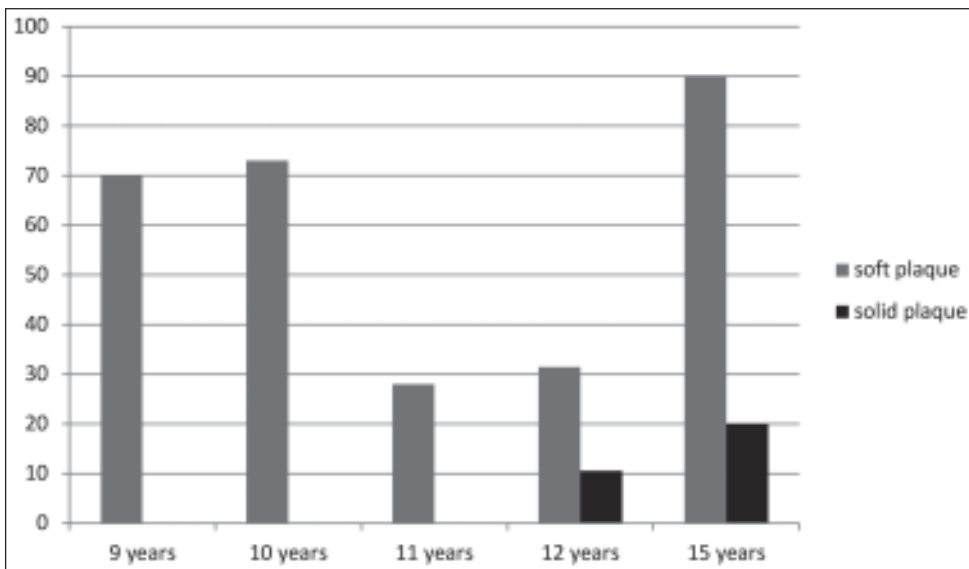


Fig. 1. The distribution of children by oral hygiene, %.

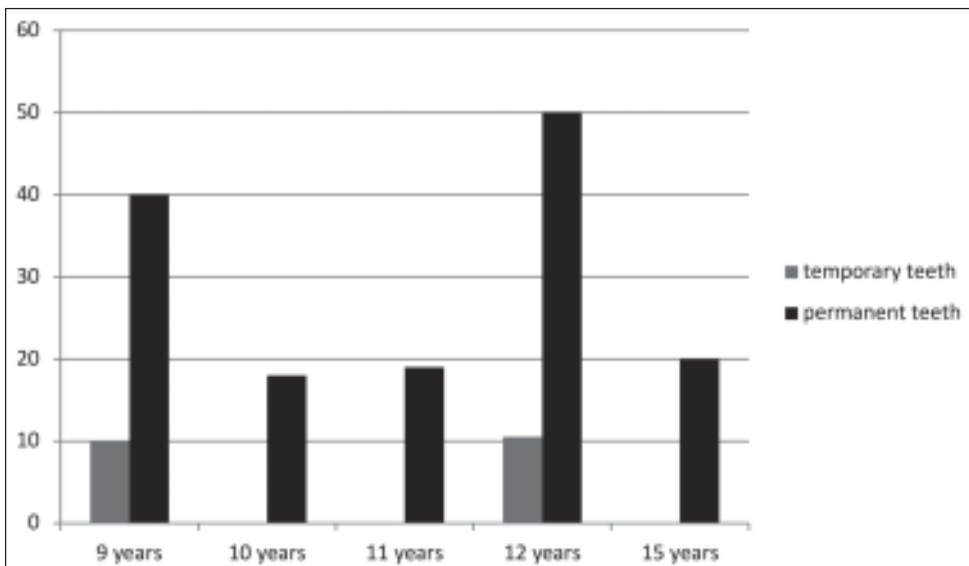


Fig. 2. Caries prevalence in examined children, %

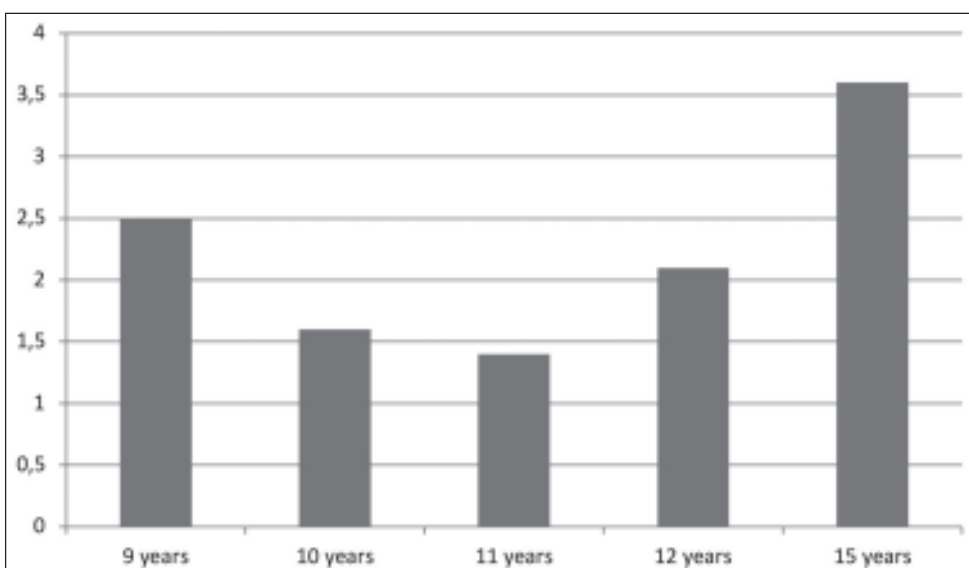


Fig. 3. The level of dental caries intensity in the examined children, %

Table I. Structure of dental caries intensity index prevalence of caries complications of caries %.

Child's age	Tooth decay	Sealed teeth	Teeth removed	Complications of caries
9 years	40,0	70,0	-	-
10 years	54,5	64,0	-	9,1
11 years	66,0	66,0	9,0	9,0
12 years	79,0	31,5	-	24,0
15 years	60,0	70,0	10,0	-

According to the data in Fig. 3 it is seen that the average level of caries intensity, according to WHO criteria, was detected in children aged 15 years, which is 3.6%. Other children had a low level of caries intensity: 9 years – 2.5%, 10 years – 1.6%, 11 years – 1.4%, 12 years – 2.1%. An important step in the study was to study the structure of the dental caries intensity index and the prevalence of caries complications in the examined children. The results are shown in Table I

The results of the analysis are given in table I. And the data of the structure of the index of dental caries intensity and the prevalence of caries complications make it possible to state the following:

- caries affected teeth in all children with the highest level of age 12 (79.0%) and 11 (66.0%) and 15 (60.0%) years;
- Sealed teeth in children of all ages, examined with the highest level at the age of 9-15 (70.0% each) and 11 (66.0%) years;
- removed teeth found in children aged 11 and 15 years: 9.0% and 10.0%, respectively;
- complicated dental caries were detected in children aged 10-12 years with the highest level in children aged 12 years (24.0%).

We studied the location of dental lesions in children. Most of the affected teeth are found to be molars and premolars on both jaws. In the upper jaw, the tooth loss is 55% and 30%, respectively, in the lower jaw 75% and 25%.

In the clinical examination of children, an orthodontic index was also established as a pathology of the bite. Bite pathology was most pronounced in children 12 years of age (31.5%).

Considering that in the prevention of caries and pathology of the bite of great importance is the biological value of the daily diet and the nature of food we conducted a sociological study among the examined children in order to study their diet.

Based on the results of the survey of the surveyed children, it was found that in the daily diet of children, regardless of age and sex in which tooth decay is detected, there is a fairly uniform set of foods. It has been established that children have low consumption of milk and lactic acid products, which can cause a decrease in the amount of calcium and phosphorus in the body. It is revealed that daily milk and lactic acid products are included in the diet of children aged 9 years at 45.0%, 10-12 years – 26.0%, 15 years – 35.0%.

The survey results show that only 45.0% of respondents consume fresh fruits and 67.0% fresh vegetables daily. This is especially true of most children of 12 and 15 years with

multiple caries. If at the age of 11 44.0% of children with multiple caries eat fruits daily, then at the age of 15, the percentage of such children decreases to 32.5% of children. At that time, 56.3% of children with caries consume sweets and pastries daily, as well as more than half (53.1%) of children with multiple dental caries consume sweet sodas every day, especially between the ages of 10-12.. At the age of 10, 67.0% of the boys use these drinks regularly. Only 22.1% of children with multiple caries rarely consume sugary drinks and never only 19.9% of those polled. More than half of children with multiple caries consume candy every day (65.7%). Sweet tea is consumed by 67.7% of children with caries.

It was found that over 80% of the respondents applied for dental care regardless of their age. At the same time, at the age of 10 and at the age of 15, more girls appealed, and at the age of 10-12 years – most boys.

Children aged 9-10 years 7-8 times a day consume cariesogenic products. And boys consume fruits more often than girls, as well as foods rich in carbohydrates and starch. Girls consume sweet dairy products more often than boys during meals. It has been established that the thirst quenching in children is mainly caused by the use of sweetened drinks, juices and sweet carbonated drinks.

CONCLUSIONS

1. Analysis of statistical data showed that for the period 2009-2018 in Uzhgorod the number of children covered by dental preventive examinations decreased by 28.9% and amounted to 13706 children, which is 60.22% of their total number. During this period, the proportion of children requiring rehabilitation decreased by 37.1% to 459.35 per thousand inspected. Remediation of the oral cavity was carried out 91.7% of those who needed it.
2. On clinical examination, 163 children aged 9 to 15 years had a mild plaque found in all children with the highest level (90.0%) in children aged 15 years and a solid plaque detected at the age of 12 and 15 years – 10, 5% and 20.0% respectively. The highest level of permanent tooth impression was found in children aged 12 and 9 years: 50.0% and 40.0%, respectively, and the lowest in children 10 and 11 years – 18.0% and 19.0%, respectively. Temporary teeth are affected by caries in children 9 and 12 years: 10.0% and 10.5%, respectively. Average caries intensity, by WHO criteria, was found in children aged 15 years, which is 3.6%. The rest of children have a low level of caries intensity: 9 years – 2.5%, 10 years – 1.6%, 11 years – 1.4%, 12 years – 2.1%.

3. When studying the structure of the index of dental caries intensity and the prevalence of caries complications it was found that caries affected teeth in all children with the highest age of 12 (79.0%) and 11 (66.0%) and 15 (60.0%). years; dental fillings in children of all ages, examined with the highest level at the age of 9.15 (70.0% each) and 11 (66.0%) years; removed teeth found in children aged 11 and 15 years: 9.0% and 10.0%, respectively; complicated dental caries were detected in children aged 10-12 years with the highest level in children aged 12 years (24.0%). The study found that the upper jaw of the molars and premolars was respectively 55% and 30%, the lower jaw 75% and 25%.
4. The results of the sociological survey revealed that, regardless of age and sex, children who have caries revealed that they do not eat rationally: they consume little milk and lactic acid products (26.0% -45%), 45.0% daily eat fresh fruits and 67.0% fresh vegetables, most consume sweets and sugary drinks daily.

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Conflict of interest:

The Authors declare no conflict of interest

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