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RISK FACTORS FOR PERIODONTAL DISEASE IN CHILDREN LIVING IN CITIES WITH ADVERSE ENVIRONMENTAL CONDITIONS

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Abstract. For the development and implementation of a comprehensive system of prevention of dental diseases and clarification of calculation standards for the needs in dental treatment and preventive care essential information characterizing the level and structure of dental diseases among the studied populations. On this basis, we conducted a dental survey among children and youths of the urban population of Uzbekistan, living in industrialized cities.

Determined to study 2 city: Chirchik in our research was considered to be experienced where the air is contaminated with sulphur dioxide, oxides of nitrogen and carbon, ammonia and dust emitted by industrial enterprises (chemical plant "Maxam-Chirchiq", transport and kaprolaktamovets); Tashkent with the most optimal environmental conditions .

In 2 cities of different levels were surveyed 215 (under 3 years), preschoolers 438 (3-6 years), 417 children of school age (6-15 years), 639 boys and girls aged 15-18 years. The total number of surveyed children was 1709.

Gingivitis in children are quite rare, especially in the age group of 3 years – isolated cases. At the age of 6 they are diagnosed, respectively, $19,46 \pm 1.42\%$ to $27,70 \pm 1,29\%$ in the cities of Tashkent and Chirchik.

Significantly change the value of the indicators of the surveyed students comprise 6-15 years $31,11 \pm 3,22$ to $38,29 \pm 2,37\%$; 15-18 years $34,94 \pm 2.98$ to $42,23 \pm 3,79\%$ the cities of Tashkent and Chirchik.

Thus, since early childhood (from 3 years) , marked inflammation of periodontal, poor oral hygiene. These indicators are worse in the surveyed cities of Chirchik, the environment which is polluted by industrial emissions.

Consequently, there is a need for careful attention not only to reside in the city, but attracting doctors to preventive measures to prevent oral diseases, and clinical consideration of the groups surveyed, with the worst indicators of the status of the dentition.

Keywords: gingivitis, preschoolers, school children, periodontitis, dental system, the frequency, the periodontal status.

Introduction. We live in the XXI century; this is the century of scientific and technological progress, which is based on the widespread introduction of new technologies in our lives. It should be noted that scientific and technological progress is a decisive factor in the growth of social production [1,4].

Socio-economic transformations in Uzbekistan in recent years have had a significant positive effect on dental care, which is one of the popular types of medical care for the population. The complexity of solving the problems of improving dental care for the population is determined by the high and increasing incidence of diseases of the dentition system [1,2,4,12].

According to WHO and various authors, the prevalence of dental diseases among children reaches 75-95%, adult – 100% (A.B. Алимский, 2008; Jones J.A., 1994; Ripa W., 1995).

In Uzbekistan, the prevalence of dental diseases is also high due to the development of industry and transport, increased production and consumption of energy, intensification and chemicalization of agriculture, everyday life, urbanization and urban growth [4,6,12]. The formation of territorial production complexes leads to such environmental pollution that already

directly affects the health status and morbidity of the region's population, especially children, as the most vulnerable layer of the population to external environmental factors [3,5,6,8,9,11].

In industrial centers, sources of pollutants hazardous to human health are formed by geological and geochemical and other agents and processes in the environment.

Geological and geochemical sources form finely dispersed, nanostructured and other disintegration and weathering masses of natural igneous, metamorphic and sedimentary rocks and ores with subsequent transfer and accumulation in aerosol form. These pollutants cover vast territories, and the aerosol (dusty) mass itself is richly represented by the mineral components of the nanostructured form [7, 10, 12]. (Table.1).

Table 1

The chemical composition of the nanostructured mineral phase of aerosols in industrial centers of Uzbekistan (average of 20 samples of aerosol-dust concentrate)

Component	Vibration limits content by weight,%	The average
SiO ₂	19,79-66,35	20
Al ₂ O ₃	6,64-17,93	10
FeO+Fe ₂ O ₃	3,98-15,40	5
TiO ₂	0,05-0,60	0,1
MnO	0,26-1,12	0,4
CaO	2,42-32,28	15
MgO	1,69-4,75	3
Na ₂ O	0,56-3,82	2
K ₂ O	1,46-2,89	2
P ₂ O ₅	0,10-0,83	0,3
S	1,12-8,92	2
Nanocomponent	Vibration limits, g / t	The average
Au	0,027-14,65	3
Ag	0,43-22,61	4
Pd	0,10-0,59	0,03
Rh	0,018-1,132	0,02
Cu	160-2500	500
Zn	100-3500	500
Pb	20-2500	100
Cd	6,10-62	10
Re	0,0007-0,662	0,001
In	0,05-0,45	0,1
I	0,8-24,7	1.1
Hg	0,61-8,5	2,5
Bi	0,91-6,1	2,5
Se	2,40-44,61	10
Te	0,32-13,40	5
V	70-200	100
Cr	55-177	100
Co	24-256	50
Ni	5-500	100
Be	0,13-1,67	0,5
B	18,69-170	30
Se	14-30	15
W	5,58-25,24	10

One of the problems of improving dental care is the prevention of dental diseases. A significant amount of literature is devoted to the problems of prevention of dental morbidity. [6,9,10,12]. As international and domestic experience shows, the entire prevention system should be based on appropriate prevention programs - a single national and private regional (V.G. Butova, Yu.M. Maximovsky et al., 2000; V.L. Kowalski, 2002; N.M. Kunitsina, 2003; D.G. Meshcheryakov, 2006).

Children's health is considered one of the most sensitive, integral and informative biomedical indicators characterizing the qualitative characteristics of the environment. Therefore, the level of health of the child population is directly dependent on the intensity, duration of the impact of environmental pollution and the degree of adaptation to it [9,10,12].

Objective: To study the prevalence, frequency and prevention of periodontal disease in children living in cities with adverse environmental conditions.

Materials and methods

In order to develop and implement a program for the prevention of dental morbidity and to clarify the calculations of the standards for the need for dental treatment and preventive care, information is essential that characterizes the level and structure of dental diseases among the studied population groups. Based on this, we conducted a dental examination among children and young people of the urban population of Uzbekistan, divided into age groups recommended by WHO.

In this regard, the dependence of the state of the oral cavity of the population on the impact of anthropogenic environmental factors was studied in two cities with different environmental pollution.

Two cities were identified for the study: Chirchik was considered experimental in our studies where atmospheric air is polluted with sulfur dioxide, nitrogen and carbon monoxide, ammonia and dust emitted by industrial enterprises (Maxam-Chirchiq chemical plant, transport and caprolactam plants); Tashkent city with the most optimal environmental situation.

In addition to dental examination, the following clinical and functional research methods were used: Schiller-Pisarev test (PMA), Green-Vermilion index (OHIS).

In accordance with the main objectives, program and methodology described above, under our guidance and with our direct participation, with the involvement of local dentists during 2012-2014. A dental examination of 1709 children living in various cities of the Republic was carried out (tab. 2).

In 2 cities of different levels, 215 (up to 3 years old), 438 preschool children (3-6 years old), 417 school-age children (6-15 years old), 639 boys and girls aged 15-18 years were examined (table 2).

Surveys of the oral cavity in children living in the territory of industrial enterprises showed a significant effect of polluted air on the general well-being of children living in these zones.

Table 2

The number and age-sex composition of the examined contingent

Age groups years old	Tashkent		Chirchik		Total		
	man	women	man	women	man	women	both sexes
До 3	205		210		210	205	215
	104	101	106	104			
3-6	221		217		222	216	438
	111	110	111	106			
6-15	209		208		209	208	417
	103	106	103	105			
15-18	312		327		312	327	639
	153	159	159	168			

Results and discussions

In the process of examining the child and youth population, it was planned to study the frequency and nature of pathological changes in periodontal disease, their age dynamics. The following clinical indicators were determined: level of oral hygiene; violation of the structure of soft tissues of the vestibule of the oral cavity. The nature of violations of the vestibule of the oral cavity and dent facial anomalies did not differentiate, only the presence or absence of them was noted.

The first signs of the disease are already found in the milk bite, and with age, the frequency and severity of the disease increases.

Table 3

The prevalence of gingivitis (%)
(M±m)

Age years	Tashkent	Chirchik
Before 3 years old	1,46 ±0,15	1,85±0,12
3 - 6 years old	19,46 ±1,42	27,70±1,29
6 -15 years old	31,11 ±3,22	38,29±2,37
15-18 years old	34,94 ± 2,98	42,23±3,79

Gingivitis in children is observed quite rarely, especially in the age group up to 3 years - isolated cases. At the age of 6 years, they are diagnosed, respectively, from 19.46 ± 1.42% to 27.70 ± 1.29% in the cities of Tashkent and Chirchik (table 3).

The values of the indicators of the examined schoolchildren significantly change, accounting for 6–15 years of age 31.11 ± 3.22 to 38.29 ± 2.37%; 15-18 years old 34.94 ± 2.98 to 42.23 ± 3.79% in the cities of Tashkent and Chirchik (Table 2).

In the city of Chirchik, among preschoolers, gingivitis is more common than in other cities. Chirchik preschoolers have gingivitis indices that are higher than Tashkent preschoolers by an average of 24.76%, while schoolchildren have similar indicators on average by 17.41%.

In cities, a relatively low frequency of gingivitis among schoolchildren is noted, and then at the age of 6-15 years it increases by 1.3 - 1.5 times. The wave-like dynamics of the frequency of gingivitis suggests that during the growth of children, inflammatory changes in periodontal disease can stop spontaneously. Gingivitis is 5.2–9.6% less common in girls than in boys, but these differences are not statistically significant.

To study an indirect assessment of periodontal tissue condition, the PMA index used for epidemiological studies was used. The value of the PMA index is presented in (tab 4).

Table 4

Index value PMA
(M ±m%)

Age years	Tashkent	Chirchik
Before 3 years old	0,23±0,04	0,26±0,03
3 - 6 years old	2,34±0,13	2,44±0,42
6-15 years old	2,43±0,14	3,74±0,38
15-18 years old	3,68±0,41	3,83±0,25

Note: P <0.05 significance of differences when compared with data from Tashkent.

In the age group of 6-15 years, the RMA index in children in Chirchik was significantly higher than in Tashkent (P <0.05). There were no significant differences in the PMA index in other age groups.

However, starting from the age group of 6-15 years, RMAs above 3 in Chirchik were identified, which is an unfavorable fact. Inflammatory reaction increases with age, mainly in boys.

Table 5

The value of the PMA index in Different age and gender (M ±m%)

Age years	Tashkent		Chirchik	
	man	Woman	man	Woman
Up to 3 years	0,21±0,02	0,24±0,03	0,29±0,04	0,24±0,04
3- 6 year	2,25±0,17	2,43±0,27	2,54±0,24	2,41±0,21
6-15 year	3,65±0,22	3,52±0,33	3,83±0,28	3,64±0,33
15-18 year	3,86±0,37	3,43±0,41	3,71±0,24	3,79±0,34

A more prosperous periodontal condition was among residents of Tashkent, the worst - among those examined in Chirchik (tab. 5). As a rule, the value of periodontal parameters was slightly better in females, although the differences were significant only in isolated cases.

To assess oral hygiene and determine the effectiveness of the use of hygiene products, as well as to clarify the role of hygiene in the etiology of tooth and periodontal diseases, we determined the proportion of tooth surface covered with plaque (Green-Vermilion index) in children with gingivitis in comparison with healthy individuals.

The data (tab. 6) indicate that, with an intact periodontium, the Green-Vermilion index in the examined children of cities within and between age groups in each city is quite comparable. However, in the age group of 6-15 years, the indicator was slightly higher, but compared with the average value; these differences were unreliable (P> 0.05).

Table 6

The value of the Green-Vermilion index in children of various age groups with intact periodontium, conventional units (M ±m)

Age years	Tashkent		Chirchik	
	man	Woman	man	Woman
Up to 3 years	1,62±0,12	1,51±0,21	1,71±0,14	1,76±0,11
3- 6 years	1,85±0,13	1,23±0,11	2,00±0,21	1,93±0,16
6 -15 years	1,95±0,16	1,90±0,16	2,10±0,18	2,05±0,17
15 – 18 years	2,10±0,21	2,15±0,18	2,40±0,12	2,20±0,21

In general, the data obtained indicate that plaque in the studied population groups covers from 50% (index 1.5) to 80.0% (index 2.4) of the tooth surface, even in the case of a healthy periodontal.

The hygienic condition of the oral cavity was unsatisfactory in all examined groups. With gingivitis, the value of the indicators of oral hygiene is worse than with intact periodontium.

In the examined schoolchildren, periodontal diseases are represented by superficial inflammation in the form of catarrhal gingivitis. Catarrhal giginvit without therapy almost inevitably develops into periodontitis and other severe forms of periodontal disease. Destructive changes in the bones of the alveolar processes were found mainly in adolescents 15-18 years old.

The values of the prevalence and intensity of periodontal disease are the highest at the age of over 15 years.

Conclusion, starting from early childhood (from 3 years), periodontal inflammation and low oral hygiene are noted. These indicators are worse for the examined city of Chirchik, whose ecology is polluted by emissions of industrial enterprises.

Therefore, there is a need for close attention not only to those living in this city, but also the involvement of doctors in preventive measures to prevent diseases of the oral cavity, as well as clinical examination of groups of patients examined with worse indicators of the state of the dentition.

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