Approaches to development of programs for prevention and care of periodontal disease at community level

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Summary

The *aim* of the study was to assess the periodontal status and the efficacy of community preventive programs of periodontal diseases among the population of Belarus.
***Material and method*. An epidemiological survey was undertaken on 2007 subjects in different age groups of the Belarus population. The periodontal status was assessed by the CPITN.**
Oral hygiene status was evaluated using Oral Hygiene Index (OHI-S). To assess the severity of gingivitis, the gingival index (GI) was applied.
Our study indicates that there is high prevalence and severity of periodontal diseases in the population of Belarus.
Epidemiological studies have shown that poor oral hygiene coincides with high prevalence and intensity of the periodontal disease.
Preventive programs including the oral hygiene instruction of children and systematic control of the quality of toothbrushing were carried out in two regions of Belarus.
***Results*. In the 2-year program of toothbrushing among 7-year schoolchildren under supervision of teachers we noticed the reduction of parameters of Oral Hygiene Index to acceptable level: 0.77-0.82 OHI-S (reference values were 2.02-2.33) and full disappearance of chronic gingivitis: decrease of Gingival Index to the level of 0.31-0.37 GI (reference values were 0.66-0.75).**
The community programs of primary prevention of periodontal disease among schoolchildren in Belarus was effective in reducing chronic gingivitis by 40-45% in the long-term period of follow up.
***Conclusion*. Prevalence and intensity of chronic gingivitis and periodontitis can be decreased by elimination or reduction of the main risk factor of illness - the microbial teeth plaque.**

***Keywords*: periodontal disease, prevention, community level.**

Introduction

Periodontal diseases are a considerable burden to the population all over the world. However, study of this widespread pathology was not enough [1]. Up until the beginning of 1980s the data of epidemiological surveys were not compared because of different methods used. The recommended WHO “Community Periodontal Index of Treatment Needs” (CPITN) has allowed for the first time to objectively estimate a problem at a global level [2]. The following key age groups of the population were surveyed: 15-19 years, 35-44 and 65-74 yrs. The data submitted to the Global databank of WHO.

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Objectives

The aim of the study was to assess the periodontal status and the efficacy of community preventive programs of periodontal diseases among Belarus population.

Material and method

The epidemiological survey was undertaken among 2007 subjects in different age groups of population of Belarus. The periodontal status was assessed by the CPITN [3]

The 2-year program of toothbrushing was carried out among 7-year-old schoolchildren under supervision of teachers in two regions: in Minsk and Bobruisk. Oral hygiene status was evaluated using oral hygiene index [4]. To assess the severity of gingivitis, the gingival index was applied.

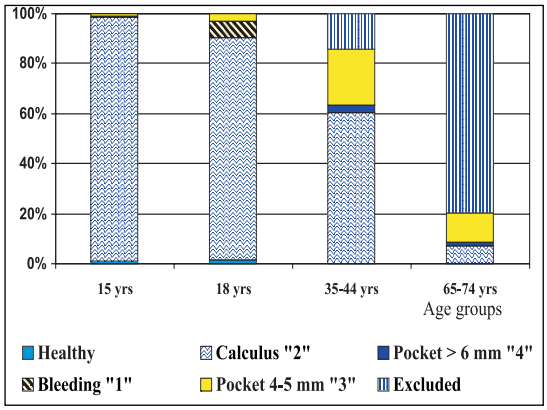
Another program of hygienic education by using a method of supervised toothbrushing (during 3 years) among 1st and 2nd grade schoolchildren was carried out in the school No. 166 in Minsk. Dental examination control with evaluation of the oral hygiene index (OHI-S) and gingival index (GI) was performed 10 years from the beginning of the program.

Results

The prevalence of the periodontal disease among Byelorussian population in 2003 [5] was the following: in 15-year-old children - 99 %, in 18-yrs young people - 97 % and in adult people - 100 %. Average of the CPITN prevalence criteria in four age groups are illustrated in *Figure 1*.

The number of sextants with the CPITN criteria is illustrated in *Figure 2*. In young age groups of 15 and 18 yrs the patients with symptoms of bleeding (CPITN “1”) and dental calculus (CPITN “2”) prevailed: 98% and 96% accordingly. The number of patients with pathological pockets was 0.85% and 2.96% in the age of 15 and 18 yrs accordingly.

Figure 1. Prevalence of periodontal diseases (CPITN index) among the population of Republic of Belarus, 2003

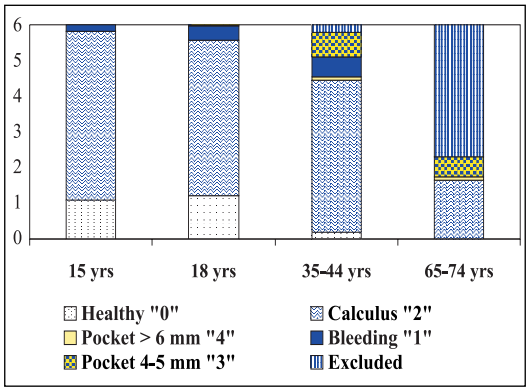


These data on the periodontal status of young people ground the necessity of preventive measures: tooth brushing and prophylaxis.

Among adult people of 35-44 yrs the dental calculus (CPITN “2”) and periodontal pockets of 4-5 mm (CPITN “3”) prevailed: 60% and 22%, accordingly. The average number of deep pockets (CPITN “4”) was 3.3%. But the situation sharply varies towards the worst side with increasing of age. In elderly persons the severe periodontitis (CPITN “4”) was typical. It was obvious that periodontal diseases favor the loss of teeth in adult people [6,7].

The average intensity of periodontal diseases in the surveyed population of different age groups is illustrated in *Figure 2*.

Figure 2. Intensity of periodontal diseases (CPITN index) among the population of Republic of Belarus, 2003



The data of the present study reveals that the average quantity of healthy sextants is very few even in young age groups: CPITN "0" varied from 1.07 to 0.12 in 18 years and was absent at adults and older persons. On the contrary, periodontitis of a middle severity level (CPITN "3") and a high severity (CPITN "4") grow up to a level of 0.68-0.56 sextants with simultaneous increase of number of the excluded sextants up to 3.61±0.25 CPITN "X" in the age of 65-74.

This part of our findings grounded the necessity of treatment of periodontal diseases at the earliest stages of their development, as there are no methods except prosthetic treatment to offer to senior age groups people.

Being based on the mentioned approaches of a preventive direction in periodontology, the Program of community prevention of dental caries and periodontal diseases was developed and introduced in the Republic of Belarus in 1997. Oral hygiene was selected as the basic method of the prevention of chronic gingivitis and periodontitis. The accent of community preventive program was put on school age children and young people. The long-term objective of preventive maintenance of periodontal diseases until 2010 was determined as an increase of the average quantity of healthy sextants in 15-yrs children by 3 times in comparison with the initial condition (in 1997 CPITN "0" was 1.0).

We have approved the methods of hygienic education with the purpose of initial preventive maintenance of periodontal diseases in schools of Minsk and other cities of Belarus. So, in the 2-year-program of toothbrushing among 7-year schoolchildren under supervision of teachers we noticed the reduction of parameters of Oral Hygiene Index (Green Vermillion) to acceptable level: 0.77-0.82 OHI-S (reference values were 2.02-2.33) and full disappearance of chronic gingivitis: decrease of Gingival Index (Loe-Silness) to the level of 0.31-0.37 GI (reference values were 0.66-0.75 GI) (*Table 1*).

Table 1. Oral hygiene (OHI-S) and gingival index (GI) among 7-year-old children participating in the program of toothbrushing under supervision of teachers (researchers: Kazeko L.A., Yudina N.A.) [8]

Groups of children and parameters	Place of research							
	Minsk				Bobruisk			
	Program		Control		Program		Control	
	OHI-S	GI	OHI-S	GI	OHI-S	GI	OHI-S	GI
Number of children	363		307		243		200	
Initial level of parameters	2.02	0.66	2.14	0.64	2.33	0.75	2.23	0.74
In 2 years	0.77	0.31	1.61	0.56	0.82	0.37	1.65	0.55
Changes of OHI-S value	-1.25	-0.35	-0.53	-0.11	-1.51	-0.38	-0.58	-0.19
Changes in % from the initial situation and reliability	-62% p<0.01	-53% p<0.01	-25% p<0.05	-13% p>0.05	-65% p<0.01	-51% p<0.01	-26% p<0.05	-26% p>0.05

In the long-term program of hygienic education with use of a method of supervised toothbrushing (during 3 years) among schoolchildren of 1st and 2nd grades, an improvement of oral hygiene and elimination of chronic gingivitis were noted in the first 3-6 months after the beginning of the program and steady acceptable parameters of the periodontal status within 3 years [9]. Although the supervision of toothbrushing

after three years from the beginning of the program was stopped, but the motivation of schoolboys to apply regular oral hygiene proceeded at lessons of health and in daily conversations of the dentist. Dental examination control with evaluation of Oral Hygiene Index (OHI-S) and Gingival Index (GI) was carried out in 10 years from the beginning of the program. Positive results of an estimation of medical efficiency of this long-term program of hygienic training and education of schoolchildren are received. In the preventive group of schoolchildren (15 years old), a decrease of parameters of Oral Hygiene Index by 45.3 % ($p < 0.01$) and Gingival Index by 44 % ($p < 0.01$) was observed in comparison with the control group of children in the same school, who did not participate in the program (*Table 2*).

Table 2. Oral hygiene index (OHI-S) and gingival index (GI) among 15 and 16 years old schoolchildren in Minsk [9]

Age (years)	Number of persons surveyed	Average indexes				Changes		Reliability P
		Preventive group		Control group				
		OHI-S	GI	OHI-S	GI	OHI-S	GI	
15	75	1.40	0.45	2.56	0.79	45.3%	43%	<0.01
16	106	1.93	0.59	2.04	0.57	5.4%	3.5%	>0.05

The community program of hygienic education for teenagers (618 schoolchildren) was developed and introduced in Mogilyov. It included motivation, oral hygiene instruction, control of skills and prophylaxis. The estimation of results of preventive maintenance in one year has shown that oral hygiene of schoolchildren was improved by 55.7%, the gingival inflammation has decreased by 51%, and the average number of healthy sextants has increased by 2.6 times. [10]

Discussion

From the above-stated it follows that the basic method of initial preventive maintenance of periodontal diseases, which was scientifically proved, is the system of the actions excluding risk factors of diseases, i.e. education of a healthy behavior. Hygienic education is a system of inculcation of useful skills and habits on the basis of knowledge of rules of a healthy way of life and conviction in the necessity of their observance. The main working form with adults is persuasion and preaching. The basic form of influence on the child is training with daily reiteration and a personal example of parents.

Approaches of the dentists to realization of the hygiene education program among the population

It is necessary to recognize as the first principle of hygienic training and education interrelation of such components, as:

a) deepening knowledge of sanitary education for motivated hygienic behavior;

b) training to a technique of hygienic actions;

c) constant control of quality of performance of hygienic recommendations with the purpose to turn skill into hygienic skills.

The second principle of hygienic training and education is the systematic character and continuity. It is important to observe the continuity of forms and methods, the periodic repeatability of education elements for children, parents, tutors, teachers, medical stuff.

The third principle of hygienic training and education is to use different forms of education depending on age and psychophysical features of the child.

Conclusion

The periodontal diseases are widely spread among the population all over the world, reaching about 100% even in the teenage period of children's age. Prevalence and intensity of chronic gingivitis and periodontitis can be decreased by elimination or reduction of the main risk factor of illness – the microbial teeth plaque. Preventive programs should include oral hygiene instruction of children and systematic control of the quality of toothbrushing. Such programs can be organized in schools with the help of teachers. According to our investigation, the medical efficiency of supervised toothbrushing in reducing chronic gingivitis was 40-45% in the long term period of follow up.

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