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Analysis of the prevalence and intensity of dental caries in the disable children with various degrees of retardation

Summary

This article analyzes the prevalence and intensity of dental caries in children and adolescents with varying degrees of mental retardation, the justification of the need for personalized prevention and treatment of dental disease in these patients. In the study, the prevalence of dental caries in the surveyed contingent defined as high and amounted to 84.34%. With increasing severity of mental retardation increased the number of children with dental caries by 76.68% with mild to 93.87% with a deep degree of intellectual impairment. The average intensity of dental caries in children diagnosed with "mild mental retardation" was 4.82, an increase in the index of the intensity of dental caries was not only with age, but with the increasing severity of CNS pathology, by the increase in components of the "K" and "Y". Children with a diagnosis of "profound mental retardation" component "Y" was 2.33, which is 1.46 higher than that of children with mild mental deficiency.

Keywords: mentally retarded children, children with disabilities, the prevalence, intensity of dental caries.

The priority of the state policy of the Russian Federation is to preserve and promote the health of the population. Improving the provision of dental care to children in the country and keeping it up to date is an important and urgent problem, which is highly relevant for practical health care services. The study of dental disease of the population is an important step in solving this problem. Dental caries, according to WHO, is a widespread pathology of hard tissues of teeth. A situational analysis of the prevalence and intensity of dental caries showed that even at the age of one year, 15% of children are found deciduous teeth affected by caries, for the 3rd year prevalence of pathology reaches 46%, and by 6 years of primary teeth caries diagnosed in 96% of the surveyed children.

In 1998, under the guidance of Professor E.M.Kuzmina was held a dental epidemiological survey of the population in 46 regions of Russia, using uniform criteria for WHO methodology. The results of the study showed that the prevalence of dental caries in the temporary occlusion of the national average was 73%, for the Krasnoyarsk Krai it was 90.5%, and in Krasnoyarsk City - 92.0%. The prevalence of dental caries in permanent teeth in children under the age of 12 years in Russia was 78%, in the Krasnoyarsk Krai - 76.5%, in Krasnoyarsk - 78%. In adolescents 15 years of carious disease was observed in 88% of cases, on average, over the edge was 86.5%, and in the regional center - 92.7%. A similar re-examination of the Russian population was conducted in 2008, during which it was revealed that the incidence of dental caries in children and adolescents in the Krasnoyarsk Krai declined in preschool children by 10.5% and the prevalence of disease was 80% in the age groups 12 and 15 years respectively by 4.5% in each.

The analysis of the dynamics of child morbidity in the population according to the Russian epidemic surveys (1998, 2008) demonstrated the stability of the average intensity of caries of teeth

in 6-year-old children over a 10-year period, which amounted to an average of -4.78. In this case, there was redistribution of components in the "KP" index structure: a 15% reduction in the number of carious teeth, a 22% increase in the number of dental fillings, was 2.5 times higher than the number of remote temporary teeth, compared with 1998. The average KPU index in the 12 and 15-year-olds decreased by 13.7% and 12.8%, while the level of intensity of dental caries in 12-year-olds in 2008 was assessed as low, in accordance with the grade of WHO. In both age groups decreased by 28% the value of the component "K" (carious teeth), the number of dental fillings, and the number of extracted teeth was 2-3 times less than in 1998.

The problem of studying the prevalence and intensity of dental caries to date has not lost its relevance and requires further study. In today's national and international literature, there are a large number of works devoted to the epidemiology of dental caries in children and adolescents [2, 6, 7, 8, 9 and etc.], in the same time these studies were conducted for children with normal development of intelligence and there are only a few scientific publications on the state of personalized dental hard tissues in children and adolescents with developmental disabilities in intellectual sphere [1, 3, 4, 5]. In the study of these indicators while examining children with an intellectual deficiency the degree of mental retardation was not taken into account. In the Krasnoyarsk Krai today the analysis of dental disease of children with disabilities with varying degrees of mental retardation has not been conducted yet.

Objective - to study the prevalence and intensity of dental caries in mentally retarded children and adolescents in the Krasnoyarsk Krai with the gravity of the infringement of intellectual development.

Tasks:

- Determine the prevalence of dental caries in children and adolescents according to the degree of mental retardation.
- Determine the intensity of the caries process, to conduct an analysis of individual structural components of the index and identify the dependence of the values of the degree of intellectual deficiency of the surveyed population.

Materials and Methods

Dental examination of children with disabilities with varying degrees of mental retardation was carried out in a correctional school of VIII type № 6 and in specialized boarding schools № 3, № 4 of Krasnoyarsk. The surveyed population totaled 398 people, the degree of mental retardation was defined by a psychiatrist according to ICD-10, Tenth Revision, Class V. "Mental and behavioral disorders" these psychiatric diagnosis data were taken from disorder histories (development) of children and all the children, depending on the psychiatric diagnosis were divided into four groups (Table 1).

Table 1

The Structure of the Surveyed Population according to Mental Health Status

Diagnosis	Group	The number of surveyed	
		The absolute number	Share, %
Mild mental retardation (F-70)	1	94	23,62
Moderate mental retardation (F-71)	2	105	26,38
Severe mental retardation (F-72)	3	98	24,62
Profound mental retardation (F-73)	4	101	25,38
Total:		398	100

According to the WHO (1963) in order to study the dental status of the surveyed contingent it is to be divided into the following age groups of 6, 12 and 15 years (Table 2).

Table 2

The Age Structure of the Surveyed Population

Diagnosis	6 years (n=138)		12 years (n=132)		15 years (n=128)	
	The absolute number	Share,%	The absolute number	Share,%	The absolute number	Share,%
(F-70)	30	31,91	33	35,11	31	32,98
(F-71)	37	35,24	35	33,33	33	31,43
(F-72)	36	36,73	32	32,65	30	30,61
(F-73)	35	34,65	32	31,68	34	33,66

The survey was conducted in dental offices of childcare facilities using a standard set of dental tools in the presence of a social worker (teacher, nurse).

The prevalence of dental caries was determined by the formula:

$$W = [N/n] \times 100\%, \text{ where}$$

W – value, characterizing the prevalence of dental caries (%);

N – The number of persons with at least one of the signs of the dental caries (caries, fillings or teeth removed);

n – the total number of examined persons in the group.

The results were evaluated on a scale of prevalence of dental caries, proposed by WHO: low - 0-30%, average - 31-80%, high - 81-100%.

To calculate the intensity of dental caries we applied: the KP index for temporary occlusion, the KPY+KP for removable occlusion and the KPY for permanent occlusion for each of the surveyed and its average value in the groups studied. Missing primary teeth during their physiological changes did not account for the lack of reliability of caries. The intensity of caries in all groups was determined by the formula:

$$M = \sum KPY + KP / n, \text{ where}$$

M – value, characterizing the intensity of dental caries in the group studied; $\sum KPY + KP$ – the sum of all KPY/KP indexes in the group; n – the total number of persons in the group with dental caries.

The obtained data were recorded in a computer database, and then made their statistics. Based on the absolute values calculated relative (intensive and extensive coefficients) and the average value.

In determining the reliability of the results of the study relative to the average values were calculated and the corresponding mean errors. Calculations were performed using Excel, and statistical software package SPSS 9,0 for Windows.

Results of the Research

These dental examination data showed a high prevalence of dental caries in mentally retarded children and adolescents, which amounted to $84,34 \pm 0,07\%$. We surveyed the contingent diagnosed with "mild mental retardation" the prevalence of caries was the average level of the scale of the WHO - $76,68 \pm 0,08\%$, the maximum rate observed in the group of children 15 years old (80.65%). The average intensity of caries in this group - 4.82, while the component of the "K" was 2.05, "P" - 2.2 "Y" - 0,87 (Table 3). The data presented in Table 3 indicate that 6-years old in the index «KP + KPY» prevailed carious teeth to be 12 and 15-years old had a maximum value component «P», i.e. teeth treatment for dental caries and its complications

Table 3

Indicators of Dental Caries of the Teeth in Children and Adolescents
Diagnosed with "Mild Mental Retardation"

Age Groups (years)	The Prevalence of Caries (%)	KPY/KP		The Index Structure	
			K/k	P/p	Y
6	76,67	5,23	2,68	1,45	1,1
12	72,73	3,83	1,24	2,49	0,8
15	80,65	5,41	2,06	2,65	0,7

In children and adolescents diagnosed with "moderate mental retardation" the prevalence of dental caries was $79,06 \pm 0,07\%$. The indicator of this group of children above compared with the results of previous 2.38%. The average intensity of caries was 5.52, while the component of the "K" was 2.83, "P" - 1.67 "Y" - 1.03 (Table 4). In accordance with the tabulated data that 6-t, 12-t and 15-years old has a maximum value component of "K", i.e. teeth with caries or its complications.

Table 4

Indicators of Dental Caries of the Teeth in Children and Adolescents
Diagnosed with "Moderate Mental Retardation"

Age Groups (years)	The Prevalence of Caries (%)	KPY/KP		The Index Structure	
			K/k	P/p	Y
6	81,08	5,58	3,02	1,16	1,4
12	74,29	4,99	2,44	1,75	0,8
15	81,82	5,98	2,97	2,11	0,9

In children and adolescents with severe pathology of mental retardation the prevalence of dental caries was $87,75 \pm 0,06\%$, which is 11.07% higher than in the first and of 8.69% compared with the second group. The average intensity of caries was 7.42, while the component of the "K" had a maximum value of - 4.33, "P" - 1.66 "Y" - 1.47. The structure of the index of this group intensity decay as well as to the second group dominated untreated teeth (caries), but increased the number of extracted teeth, both temporary and permanent (Table 5).

Table 5

**Indicators of Dental Caries of the Teeth in Children and Adolescents
Diagnosed with "Severe Mental Retardation"**

Age Groups (years)	The Prevalence of Caries (%)	KPY/KP		The Index Structure	
			K/k	P/p	Y
6	88,89	6,63	3,89	1,04	1,7
12	84,37	7,18	4,14	1,93	1,2
15	90,00	8,46	4,96	2,0	1,5

In children and adolescents with a diagnosis of "profound mental retardation" the prevalence of dental caries in comparison with the data of the first group increased by 17.19%, with the second group - by 14.81%, from the third - by 6.12% and amounted to 93, 87 $\pm$ 0,1%, the average intensity of dental caries in children of this group was maximal - 8.72, compared with the figures of the first, second and third groups. The "K" component was 5.92, "P" - 0.47 "Y" - 2.33, i.e. there was an increase of carious and extracted teeth by reducing fillings (Table 6).

Table 6

**Indicators of Dental Caries of the Teeth in Children and Adolescents
Diagnosed with "Profound Mental Retardation"**

Age Groups (years)	The Prevalence of Caries (%)	KPY/KP		The Index Structure	
			K/k	P/p	Y
6	100	9,12	7,22	0	1,9
12	87,50	8,10	5,0	0,8	2,3
15	94,12	8,94	5,54	0,6	2,8

Conclusions:

16. The prevalence of dental caries in mentally retarded children in Krasnoyarsk at the age of 6, 12, and 15-year-old was identified as high and amounted to 84,34 $\pm$ 0,07%.
17. As long as the severity of mental retardation grows the number of children with dental caries increases, from 76,68 $\pm$ 0,08% in mild to 93,87 $\pm$ 0,1% for profound intellectual retardation.
18. The increase in caries intensity index occurs not only in relation to age, but in relation to the increasing severity of CNS pathology, due to the increase of components "K" and "Y". Because for the children with a diagnosis of "profound mental retardation" component "Y" was 2.33, which was 1.46 higher compared to the children of the first group.
19. The high prevalence and intensity of dental caries in mentally retarded children and adolescents requires more attention to this category of patients, optimization of treatment, prevention and development of a personalized program of prevention and treatment of dental diseases.

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