

pri yazvennoj bolezni zheludka [Pathomorphologic research of gingiva mucous membrane at stomach peptic ulcer] Sibirskij Konsilium [Siberian Consultation], 2005, No4, P. 37-40.

15. Yurkevich A.V. Patomorfologicheskij analiz slizistoj obolochki desny pri saharnom diabete i yazvennoj bolezni zheludka: avtoreferat dissertacii na soiskanie uchenoj stepeni doktora medicinskih nauk [Pathomorphologic analysis of gingiva mucous membrane at diabetes mellitus and stomach peptic ulcer: thesis for a degree of the doctor of medical sciences] Nauchno-issledovatel'skij institut regional'noj patologii i patomorfologii SO RAMN [Research institute of regional pathology and patomorphology Russian Academy of Medical Science]. Novosibirsk, 2005, p.35.

16. Clinical and experimental study of the regenerative features of oral mucosa under autohemotherapy / I.V. Firsova,

Yu.A. Makedonova, D.V. Mikhilchenko, S.V. Poroiskiy, S.V. Sirak // Research Journal of Pharmaceutical, Biological and Chemical Sciences. - 2015. - Vol. 6, №6. - P. 1711-1716.

The authors:

Makedonova Julia Alekseevna - Candidate of Medical Sciences, Associate Professor of the Department of Therapeutic Dentistry of FGBOU VO "Volgograd State Medical University", senior researcher at the Laboratory of pathology modeling of the Volgograd Medical Scientific Center, Volgograd, 400105. St. M.Eremenko 98-9, mihai-m@yandex.ru, 89173332400.

Fomichev Evgeniy Valentinovich - Doctor of Medical Sciences, Professor, Head of the Department of Surgical Dentistry and Maxillofacial Surgery FGBOU VO "Volgograd State Medical University", Volgograd, 400081, st. Angarskaya 7B - 44, pin177@rambler.ru, 89375541234.

Zhmerenetskiy Konstantin Vyacheslavovich – rector of FGBOU VO "Far East state medical University", doctor of medical sciences, member of correspondent RAS, Khabarovsk, 680000, st. Muraveva-Amur 35-224, zhmerenetsky@list.ru, 89145488703.

Lurkevich Alexander Vladimirovich - doctor of medical sciences, associate professor, head of Department of orthopedic stomatology of the "Far East state medical university", Khabarovsk, 680000, st. Muravieva-Amurskogo 35-233, dokdent@mail.ru, 89655025888.

Ushnitskiy Innokenty Dmitrievich - doctor of medical sciences, professor, head of the Department of therapeutic, surgical, orthopedic dentistry and pediatric dentistry of M. K. Ammosov NEFU Medical Institute, Yakutsk, 677000, st. Oyunsky 27-420, incadim@mail.ru, 89241708940.

A. A. Antonova, N. V. Strelnikova, E. L. Starovoytova,
O. L. Shevchenko, V. B. Turkutyukov, K. V. Zhmerenetsky,
Yu. L. Fedorchenko, E. A. Zaitseva

ADDITIONAL DIAGNOSTICS METHODS FOR THE PLANNING OF PREVENTION OF DENTAL CARIES AND ITS COMPLICATIONS IN CHILDREN

DOI 10.25789/YMJ.2019.65.16

ABSTRACT

Temporal teeth caries and its complications, among other unsolved global problems, are relevant in the Khabarovsk Territory. A survey of 885 children 3 and 6 years old in the Khabarovsk Territory showed a high prevalence of dental caries: at 3 years up to $70.8\% \pm 1.1\%$ and at 6 years old $- 89.4\% \pm 1.3\%$, with an intensity of affecting children 3 3.34 ± 0.09 years, by 6 years old 6.4 ± 0.9 teeth. Pulpitis is $61.7\% \pm 1.1\%$. Determination of the density of bacteria *S. S. mutans* of dental plaque from the four surfaces of the teeth, the mucous membrane of the tongue and saliva was done by the microbiological method using Dentocult SM Strip Mutans. High contamination of *S. mutans* of dental plaque from the lingual surface of the tooth and interdental space, with a titer of CFU / ml $> 10^6$, the lowest content of *S. mutans* in the saliva is CFU / ml 105. We conducted a microscopic study of the native scraping from the root of the tongue, revealed signs of chronic dehydration of the oral mucous membrane, and established its direct strong correlation with the caries, filling, extracted/removed tooth (CFR) index ($r = 0.723$, $p = 0.013$). Microcrystallization of oral fluid (MOF) was assessed, in frequently ill children, type II of the MOF (subtype B and C) is found in $70\% \pm 2.7\%$ and type III of the MOF in $26.4\% \pm 2.7\%$. Additional innovative microbiological and microscopic methods personify the approach to the diagnosis, prevention and treatment of caries in children of early and preschool age, have prognostic value and allow taking into account regional features.

Keywords: epidemiological, microbiological and microscopic studies, caries of temporary teeth, pulpitis, children, cariogenic bacteria, chronic dehydration.

Introduction. According to the WHO, the prevalence of infectious diseases of dental caries in different countries reaches 94%. The actual and still unsolved problem of children's dentistry is caries of temporary teeth and its complications [2, 7, 9, 12, 14]. The main factors of initiation and development of caries are known: the presence and high titer of cariogenic bacteria *Streptococcus mutans* and *Streptococcus sobrinus* [2, 10, 13], a low level of practical skills in oral hygiene [4], changes in the

composition and properties of the oral fluid [1, 8], uncontrolled consumption of sugars [11], low hygienic / sanological culture of parents [6], complicated during pregnancy [6, 11], which makes it possible to identify dental caries as a multifactorial polyetiological disease and an opportunistic infectious process [2]. In Eastern European countries, the caries of the teeth of children under 6 years old is 56.9% [5], in the Asian region up to 85% [5], in Russia for children 3-6 years old it is from 36% to 87%, with an

average intensity 2,8 and 4.7 teeth [4, 9], in 80% of patients complicated forms are determined [8]. Thus, the most effective correction of dental status in children is possible when identifying the leading risk factors for the development of caries and pulpitis, taking into account regional features.

Objective: to introduce additional innovative diagnostic methods for the planning of primary prevention of caries of temporary teeth in children.

Materials and research methods:

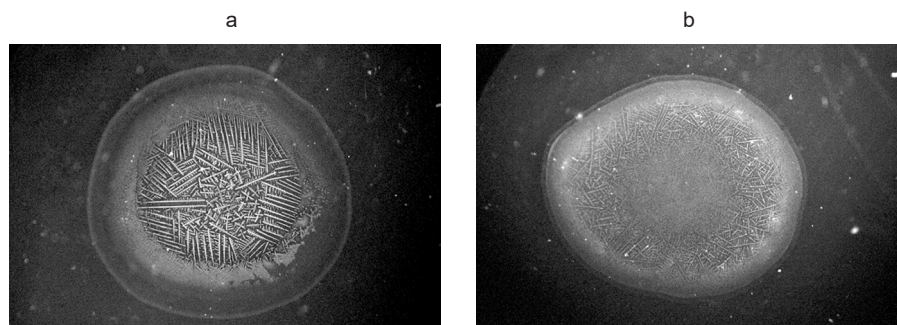


Fig.1. Evaluation of microcrystallization of the oral fluid: a. - II type (subtype A) of the MOF; b. - III type of MOF

Colonization of biotopes of the oral cavity of *S. mutans*

Species of bacteria	Oral cavity biotope	Class of seeding	Titer CFU/ml
<i>Streptococcus mutans</i>	Tongue surface of teeth	2,27±0,09**	>106
	Surface of tongue	2,27±0,09**	>106
	Interdental space	2,17±0,09*	>106
	Vestibular surface	2,10±0,11*	105-106
	Occlusal surface	2,10±0,10*	105-106

Note. Differences are statistically significant at * $p = 0.05$, ** $p = 0.01$, calculated with respect to saliva.

a survey of 885 children 3 and 6 years old living in the Khabarovsk Territory was conducted. Informed consent was obtained from the parents in accordance with Art. 20, №323-the Federal Law dated 11.21.2011. The research program, the questionnaire, the informed consent of the parents was approved by the Ethics Committee of FESMU on March 28, 2018. In the course of the epidemiological dental study we estimated prevalence and intensity of caries of temporary teeth and pulpitis, the structure "caries, filling, extracted/removed tooth" (CFR) for children under 3 years of age and "caries, filling, extracted/removed tooth" from among permanent teeth + caries and filling of temporary teeth (CFR + cf) for children with replaceable bite. The level of oral hygiene (HL) was determined by indices: 3 years by E. M. Kuzmina (2000); at the age of 6 according to Fyodorov-Volodkina (1968). Caries genicity of dental plaque (CGP)

was detected by the method of Hardwick-Manley (1952), modified by T. G. Petrova. Microcrystallization of saliva / oral fluid (MOF) was assessed by the method of wedge dehydration according to VN Shabalin and S. N. Shatokhina (2001).

Additional innovative diagnostic methods were introduced: microbiological determination of the presence and density of *S. mutans* contamination of four surfaces of intact areas of the teeth, tongue mucosa and saliva (Patent for the invention of the Russian Federation 2661609, 17.07.2018). The degree of colonization of the oral cavity was evaluated by the culture method according to the instructions "Dentocult SM Strip Mutans", "Vivadent", and compared with a reference card, distributed into classes in accordance with CFU / ml. For a microscopic study of dehydration of the mucous membranes of the oral cavity (MMOC), a native tongue scraping (Patent for

the invention of the Russian Federation 2668498, 01.10.2018) stained by Gram was investigated [3]. In order to identify the presence or absence of postnatal risk factors for the development of dental diseases in children, a sociological survey of parents on the developed questionnaire was conducted.

Data analysis was performed using the statistical software package Statistika 10.0. Student's t-criterion, the exact criterion of Fisher's χ^2 were determined, the Pearson criterion, the Chaddock's scale were used.

Results and discussion. According to the epidemiological study, in the Khabarovsk territory the prevalence of dental caries in 3 years old was 70.8% \pm 1.1% and in 6 years old - 89.4% \pm 1.3%, $p = 0.001$, which by criterion WHO corresponds to a high level, with an intensity of lesion in children 3 years old 3.34 ± 0.09 , to 6 years old 6.4 ± 0.9 teeth, $p = 0.001$. Pulpitis accounts for an average of $61.7\% \pm 1.1\%$ of cases. Analysis of the structure of cfr and CFR + cf showed the predominance of the component "c": in 3 years to 2.1 teeth and at 6 years - an increase to 4.8 affected teeth. A direct strong connection between the ct and HL of the oral cavity was revealed: with a single lesion, the hygiene level is satisfactory and is 0.3 ± 0.01 in infants, 1.4 ± 0.03 in preschool children; in the case of multiple caries, a poor HL predominates - 0.93 ± 0.01 in 3 years old; and in 6 years old - 2.1 ± 0.2 - unsatisfactory ($r = 0.97$; $p = 0.011$). This is due to the low level of hygienic knowledge of parents, which is confirmed by a sociological survey: $47\% \pm 1.3\%$ of the children polish their teeth once a day and $58\% \pm 2.1\%$ twice a day, $p = 0.001$. This is due to the low level of hygienic knowledge of parents, which is confirmed by a sociological survey: $47\% \pm 1.3\%$ of the children polish their teeth once a day and $58\% \pm 2.1\%$ twice a day, $p = 0.001$. $69.2\% \pm 1.27\%$ of mothers are introduced into the baby's diet sweet food in 1 - 2 years. The later the child was introduced sugar-containing products, the lower the indicator of the intensity of dental caries ($r = -0.40$, $p = 0.01$).

Sweetened drinks and juices for the night give $26.97 \pm 3.12\%$ of parents - these children are characterized by a direct strong correlation with a high cfr index ($r = 0.82$, $p = 0.01$), low level of practical hygiene skills oral cavity ($r = 0.61$, $p = 0.05$) and pronounced CGP ($r = 0.41$, $p = 0.05$). In children with low caries resistance in $43.5\% \pm 2.1\%$ of cases, an unsatisfactory level of hygiene was recorded, which causes aggressive

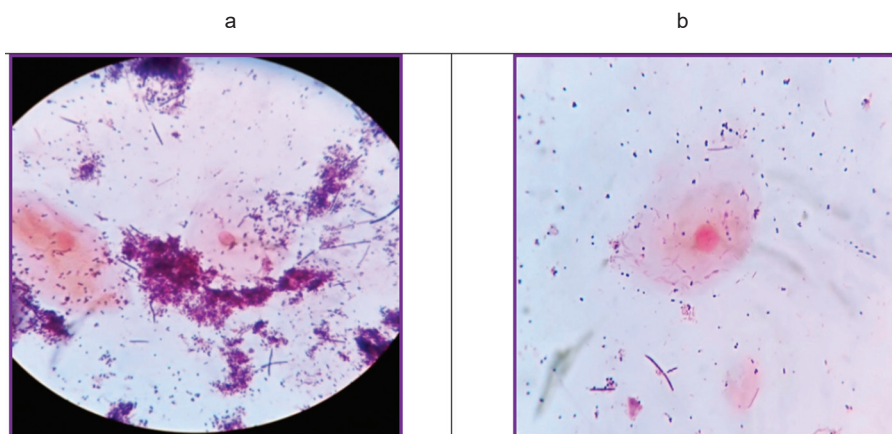


Fig. 2. Native scraping from the root of the tongue (Gram method, microscopy with immersion, magnification *1500): a - signs of chronic dehydration, b - normal view

caries in $37\% \pm 1.3\%$ of children in the Khabarovsk territory ($r = 0.61$, $p = 0.01$).

The presence of abundant dental plaque and its cariogenicity play a leading role in the initiation and progression of caries of temporary teeth in children: a pronounced CGP with multiple caries - 2.64 ± 0.6 and a low CGP - 1.3 ± 0.01 , ($r = 1$; $p = 0.01$) with single lesions of temporary teeth.

The evaluation of the MOF revealed types that depend on the degree of caries activity and the somatic status of children: I type of MOF in $45.5\% \pm 1.3\%$ cases and type II (subtype A) prevailed in $23.5\% \pm 1.7\%$ cases of the examined (Fig. 1, a) with single lesions of caries and absence of somatic pathology.

In frequently ill children, the saliva structure changes (Figure 1, b): in $70\% \pm 2.7\%$, type II of the MOF is determined (predominantly subtype B and C) and $26.4\% \pm 2.7\%$ of cases III type of MOF.

An analysis of microbiological studies of biotopes of the oral cavity (Table) showed high contamination by *S. mutans* bacteria on the surface of the tongue, dental plaque from the lingual surface of the tooth and the interdental space and their greatest informative value, with a CFU / ml $>10^6$ / ml titer, and the lowest *S. mutans* in saliva - CFU / ml $<10^5$ ($p = 0.001$), when compared.

The revealed maximum contamination of *S. mutans* of the tongue surface of the teeth and the tongue has a prognostic value: when planning a program of prophylaxis, it should be borne in mind that the tongue can serve as a place of constant donation of pathogenic/cariogenic streptococci.

Microscopic examination of native scrapings from the root of the tongue (Fig. 2 a, b) revealed signs of chronic dehydration of MMOC in children, established its direct strong correlation with the index cfr ($r = 0.723$, $p = 0.013$): in $85\% \pm 2.6\%$ with decompensation of caries recorded a variety of clusters of microorganisms, their pronounced co-adhesion, so-adhesion and histadhesion; insufficient volume and high viscosity of saliva (Fig. 2, a) while, according to the survey, $40.7\% \pm 1.7\%$ of children prefer juices and compote, and drinking water is less than $10\% \pm 0.9\%$ of the subjects. Children who observe water drinking regimen have a lower rate of formation of dental plaque; smears show a low degree of co-adhesion, so-adhesion and histadhesion, no accumulation of microbes and viscous mucus (Fig. 2b).

Conclusion. Thus, a survey of children of early and preschool age showed a lack of regular rehabilitation, a high titer of

pathogenic *S. mutans* in dental plaque, a low level of knowledge of oral hygiene, chronic dehydration of the MMOC and pronounced cariogenic of dental plaque. The results of a sociological survey of parents indicate an insufficient level of their hygienic knowledge, the use of unbalanced nutrition of children with a predominance of sugars. Low preventive activity and lack of parental control dictates the need to intensify programs aimed at increasing their compliance and sanological culture. Our study showed a high prognostic value of additional innovative research methods, which allows us to recommend them for a broad introduction and personalized approach to the program for the prevention of caries and its complications in children.

References

1. Leont'ev V.K., Ivanova G.G. Metody issledovaniya rotovoj zhidkosti i sostoyaniya tvorydyh tkanej zubov (obzor literatury), chast' II [Methods of investigating the oral fluid and the state of dental (literature review), part II] Institut stomatologii [Institute of dentistry]. St. Petersburg, 2014, № 1 (61), P. 96-97.
2. Strel'nikova N.V., Antonova A.A., Starovojtova E.L. [et al.] Karies vremennyh zubov i ego oslozhneniya u detej kak social'no znachimoe infekcionnoe zabojevanie [Temporary teeth caries and its complications in children as a socially significant infectious disease] Yakutskij medicinskij zhurnal [Yakut medical journal]. Yakutsk, 2018, № 1, P. 78 – 83.
3. Strel'nikova N.V., Antonova A.A., Kol'tsov I.P. [et al.] Novye vozmozhnosti mikroskopicheskogo metoda issledovaniya nativnogo soskoba kornya yazyka v stomatologii, gastroenterologii i mikrobiologii [New possibilities of the microscopic method research of native scraping of the tongue root in dentistry, gastroenterology and microbiology] Dal'nevostochnyj medicinskij zhurnal [Far East medical journal]. Khabarovsk, 2017, № 4, P. 52 – 55.
4. Skripkina G.I., Pitaeva A.N., Romanova Yu.G., Golochalova N.V. Kariesogennost' zubnogo nalyota i problema prognozirovaniya kariesa zubov v detskom vozraste [The ability of dental plaque to cause caries and the problem of predicting dental caries in childhood] Stomatologiya detskogo vozrasta i profilaktika [Pediatric dentistry and prophylaxis]. Moscow, 2014, Vol. 13, № 2 (49), P. 9 – 11.
5. Starovojtova E.L., Antonova A.A., Strel'nikova N.V. Karies zubov u detej rannego vozrasta kak social'no znachimaya problema. Obzor literatury [Dental caries in early childhood as a socially significant problem. Literature review] Dal'nevostochnyj medicinskij zhurnal [Far East medical journal]. Khabarovsk, 2018, № 4, P. 106-111.
6. Starovojtova E.L., Antonova A.A., Strel'nikova N.V., Lemeshchenko O.V. Sanologicheskaya kul'tura roditel'ej kak osnova stomatologicheskogo zdorov'ya detej [Sanology culture of parents as the basis of the children dental health] Zdorov'e i obrazovanie v XXI veke [Health and education in XXI century]. Moscow, 2017, Vol. 19, №10, P. 157 – 162.
7. Ushnitskij I.D., Yavorskaya T.E., Savvinov N.V., Degtyaryova A.V. Kliniko-fiziologicheskaya harakteristika sostava i svoystv rotovoj zhidkosti i tvorydyh tkanej zubov u detej mladshego shkol'nogo vozrasta, prozhivayushchih v vysokih shirotah [Clinical and physiological characteristics of the composition and properties of oral liquid and hard tooth in children of primary school age, living in high latitudes] Ehndodontiya today [Endodontics today]. Moscow, 2012, № 4, P. 43 – 46.
8. Shevchenko O.L., Antonova A.A. Sostav smeshannoj slyuny i pokazateli kariesa vremennyh zubov i ego oslozhnenij u detej [The composition of mixed saliva and the indices of caries of temporary teeth and its complications in children] Ehndodontiya today [Endodontics today]. Moscow, 2015, № 4, P. 8 – 12.
9. Shevchenko O.L., Elistratova M.I., Germash V.I., Starovojtova E.L. Osobennosti lokalizacii karioznych porazhenij vremennyh zubov u detej Dal'nevostochnogo regiona [Features of localization of carious lesions of deciduous teeth in children of the Far East region] Zdorov'e i obrazovanie v XXI veke [Health and education in the XXI century]. Moscow, 2017, Vol. 19, № 12, P. 228–233.
10. A systematic review of risk factors during first year of life for early childhood caries / P.M. Leong, M.G. Gussy, Barrow S.Y. [et al.] // Intern. Journal of pediatric dentistry. – 2013. – № 23 (4). – P. 235 – 250. Hakan Çolak. Early childhood caries update: a review of causes, diagnoses, and treatments / Ç. Hakan, T.D. Çoruh, D. Mehmet, M.H. Mehmet // J Nat Sci Biol Med. – 2013. – № 4 (1). P. 29 – 38.
11. Effectiveness of CRT at measuring the salivary level of bacteria in caries prone children / M. Cannon, B. Trent, A. Vorachek [et al.] // J Clin Pediatric Dent. – 2013. – № 38 (1). P. 55 – 61.
12. Hakan Çolak. Early childhood caries update: a review of causes, diag-

noses, and treatments / Ç. Hakan, T.D. Çoruh, D. Mehmet, M.H. Mehmet // J Nat Sci Biol Med. – 2013. - № 4 (1). P. 29 – 38.

13. Hong H.L. High caries prevalence and risk factors among young pre-school children in an urban community with water fluoridation / H.L. Hong, R.A. Bagramian, S.M. Hashim Nainar // International Journal of Pediatric Dentistry. – 2014. - № 24. – P. 32-42.

14. Oda Y. Longitudinal study of dental caries incidence associated with *Streptococcus mutans* and *Streptococcus sobrinus* in patient with intellectual disabilities / Y. Oda, F. Hayashi, M. Okada // BMC Oral Health. – 2015. - № 15 (102). - P. 1 – 5.

The authors:

Antonova Aleksandra Anatolyevna - the head of the department of Children Stomatology of the Far Eastern State Medical University of the Russian Ministry of Health, the doctor of medical sciences, professor

Address: 680021, Khabarovsk, Vladivostokskaya Str., 22 - 49.

Cell phone: +7962-586-29-37, e-mail: alex.antonova@rambler.ru

Strelnikova Natalya Viktorovna - the associate professor of department of microbiology, virology and immunology of the Far Eastern State Medical Univer-

sity of the Russian Ministry of Health, the PhD of medical sciences.

Address: 680020, Khabarovsk, Sheronov Str., 3 - 89.

Cell phone: +7924-925-89-85, e-mail: jpdom@mail.ru

Starovoytova Elena Leonidovna - the assistant of department of Children Stomatology of Far Eastern State Medical University of the Russian Ministry of Health

Address: 680510, village of Topolevo, Lugovaya Str., 7 - 12

Cell phone: +7914-543-82-98, e-mail: doc-el@mail.ru

Shevchenko Olga Leonidovna - the assistant of department of Children Stomatology of Far Eastern State Medical University of the Russian Ministry of Health

Address: 680054, Khabarovsk, Strelnikov Str., 27 - 11.

Cell phone: +7924-201-69-50, e-mail: olgash.1985@mail.ru

Turkutyukov Vyacheslav Borisovich - the head of the epidemiology and military epidemiology department of the Pacific State Medical University of Russian Ministry of Health, the doctor of medical sciences, professor

Address: 690002, Vladivostok, Ave Ostryakov, 2.

Cell phone: + 7914-734-75-00, e-mail: vyach.12593@mail.ru

Zhmerenetsky Konstantin Vyacheslavovich - the rector of The Far Eastern State Medical University of Russian Ministry of Health, the doctor of medical sciences, the member correspondent of RAS.

Address: 680000, Khabarovsk, M. Amursky Str., 35.

Tel.; +74212-30-53-11, e-mail: rec@mail.fesmu.ru

Fedorchenko Yuriy Leonidovich - the professor of the department of Faculty Therapy with a course of endocrinology of the Far Eastern State Medical University of the Russian Ministry of Health, the doctor of medical sciences, professor.

Address: 680000, Khabarovsk, M. Amursky Str., 35.

Cell phone: +7914-776-19-16, e-mail: ulfedmed@mail.ru

Zaitseva Elena Aleksandrovna - the Doctor of Medical Sciences, Full Professor, Leading Researcher of the Central Research Laboratory, Federal State Budgetary Educational Institution of Higher Education "Pacific State Medical University" of the Ministry of Healthcare of the Russian Federation.

Address: 690002, Vladivostok, Prospekt Ostryakova, 2.

Cell phone: + 7902-524-57-20, e-mail: elza200707@mail.ru.

HEALTHY LIFESTYLE. PREVENTION

M.V. Khandy, T.I. Nikiforova, A.I. Chernogradsky, S.V. Markova, A.M. Ammosova, N.M. Zakharova, S.Yu. Artamonova, L.A. Stepanova

PREVALENCE OF SMOKING AMONG ADOLESCENTS OF YAKUTSK

DOI 10.25789/YMJ.2019.65.17

ABSTRACT

The article focuses on smoking - one of the most common bad habits spread among the major part of the world's population. Tobacco use is one of major risk factors for a number of chronic diseases, including cancer, lung and cardiovascular disease. A number of countries had adopted laws restricting tobacco advertisement, establishing a circle of persons who can buy and consume tobacco products as well as regulating smoking areas. It is proved that the respiratory system (larynx, trachea, bronchial tube, lungs) is more affected by regular intake of nicotine. That is why almost every smoker has problems with his lungs, bronchi or trachea. The aim of the research is to study prevalence of smoking among adolescents in Yakutsk. The study was conducted by a representative sample of Yakutsk schoolchildren with the use of a random number generator. 6 schools were selected from the list of all general education institutions of the city. 931 students of grades 8-11 aged 13 to 17 took a voluntary participation in the survey, among which 57,3% are boys, 42,7% are girls respectively. According to the results of the survey, the prevalence of tobacco consumption among schoolchildren in Yakutsk was 41,5%, among which 39,6% are boys, 44% are girls. Proportion of children with experience of smoking by the age 15-17 is 2.6 times higher than the indicators of a group of children aged 13-15, which indicates sustainable formation of tobacco dependence among adolescents of this age. Analysis on number of cigarettes consumed per day revealed that 71% of boys and 65% of girls smoked up to 5 cigarettes per day; 18% of boys and 30% of girls smoked from 5 to 10 cigarettes per day; 5% of children consumed 10 and more than 12 cigarettes respectively. Among occasional smokers 18% of children smoked 5 and more cigarettes per day. To fight against smoking among adolescents integrative approaches are required combining both preventive and special programs using age-appropriate modern methods of rehabilitation.

Keywords: children, adolescents, Yakutsk, Yakutia, smoking, tobacco smoking.

Introduction. According to the World Health Organization (WHO), tobacco smoking claims the lives of nearly 7

million human annually, of which more than 890,000 are passive smokers [8]. According to many authors in recent

years, cigarette consumption among adolescents has increased. Thus, the average rate of cigarette consumption for