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ANALYSIS OF MORTALITY IN YAKUTIAN POPULATION FROM 1960 TO 2010

ABSTRACT

The dynamic of the Yakutia population mortality for period from 1960 to 2010 is presented in this article. The article shows the main periods of mortality dynamics, analyzes the main causes of mortality and gives the forecast of Yakutia mortality indicators by 2030 taking into account the pace of economic development and human well-being.

Keywords: mortality, causes of mortality, demographic processes, Yakutia.

In the modern Russia the mortality rate is one of the most actual medical and demographic problems. The Republic of Sakha (Yakutia) is one of the largest regions of the Russian Federation, holds 1/6 part of the country and refers to areas with harsh climatic conditions, low population density. In the Far North the human organism is affected by a whole range of climatic, geophysical and environmental factors. These factors directly or indirectly influence on the demographic processes that have adverse effects on human health, deplete adaptive reserves of the human organism, leading to the emergence of diseases, changing their course, and contribute to premature aging and shortened life expectancy.

With the development of the North and the intensive development of the mining industry since the early 1970s to Yakutia was characterized by constant population growth, mainly due to the massive influx of working-age population from outside the republic and the natural population growth. However, as a result of social-economic and political changes in the country observed an outflow of population from the republic.

In this connection, it will be interesting to analyze the Far North population mortality for half a century from 1960 to 2010 in comparison with those of the Russia as a whole. The study is based on the official statistics of mortality of the Russian Federation and the Republic of Sakha (Yakutia) Federal State Statistics Service for the period 1960-2010.

In the dynamics of Yakutia mortality can distinguish several periods (Fig. 1).

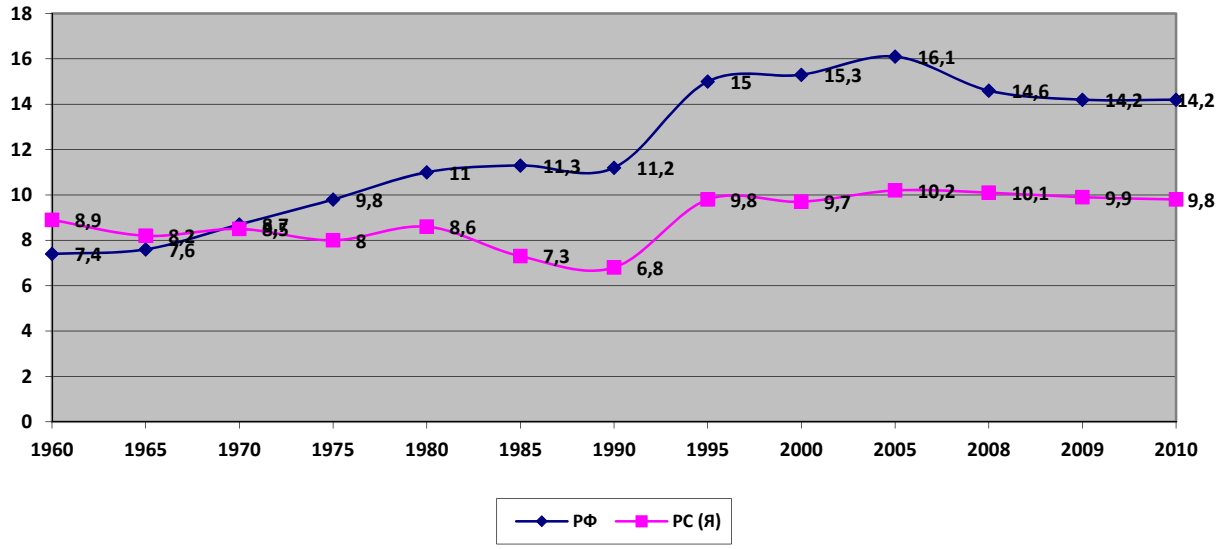


Fig. 1. **Dynamics of mortality in the Russian Federation and the Republic of Sakha (Yakutia) (number of deaths per 1000 population)**

The first period (1960-1980) – is a period of declining mortality with individual and short-term increase. Until to 1970 the mortality rate of the republic was superior to that of the average for the USSR, which is explained by the low standards of living in the North, an unsatisfactory level of medical care attributed to low [5]. Since the early 1970s the situation has changed – mortality in Yakutia decreased in comparison with average indicators in the USSR, explained by a change in the age structure of the Yakutian population. During this period, due to the rapid industrial development of the Northern territory there was a constant increase in the number of economically active young people coming from outside of Yakutia. Over the years, new towns and villages were built. Thus, between 1960 to 1980 the population of Yakutia grew by almost 1.5 times and continued to grow until 1991, when the total population reached its highest level in the history of the republic republic – 1 million 119 thousand people (Fig. 2). During this period, the average mortality rate decreased by 0.2% per year and reached 8.6% in 1980 (compared to 11.0% in the USSR).

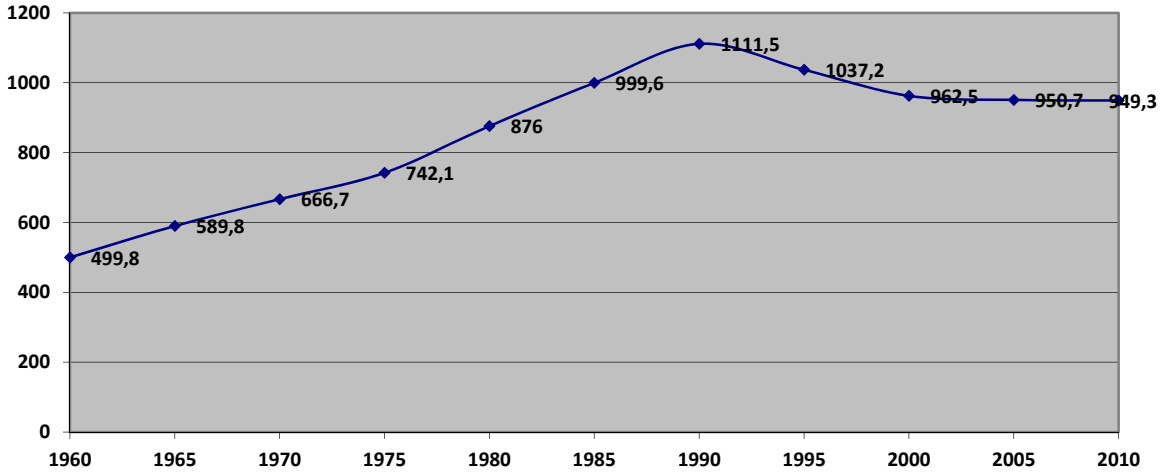


Fig. 2. **Population Dynamics of Yakutia (thousands of people)**

The second period (1980-1989) was characterized by stable and more significant decrease of mortality rate (3.2% on average per year) [1]. But it was short-lived. The dramatic decline in mortality began in 1985. The minimum rate of mortality was observed in republic in 1987 and amounted to 5.9‰. This period corresponds to the beginning of the reforms carried out by M.S. Gorbachev, two years occurred in the anti-alcohol campaign.

The third period (from the beginning of 1990s.) is characterized by the increase in level of mortality among republic population [3, 4, 11]. As a result of the influence of social-economic and political changes in the country began to leave the working population outside the country, the population of the republic acquired a pronounced tendency to decrease gradually. The maximum values of out-migration were observed in 1991-1994 and by 1995 the overall mortality rate exceeded the 1987 figure by 66% and was equal to about 9.8‰ [13].

Furthermore, since 1996 there has been some re-reduction in total mortality, and in 1998 it amounted to 8.9% of reaching the mortality rate in 1960 [2]. During these years the economy recorded positive shifts. The Government is taking a series of effective measures to maintain financial stability in the country, keeping the ruble within reasonable limits and fighting inflation. But in 1998 when the financial crisis broke out in the country, the mortality rate for the year increased by 8% (from 8.9 to 9.6‰).

The mortality rate in the Republic between 2001-2008 was stable at 10.2‰ and only after 2009 it starts to reduce [1, 6, 7-10, 12].

Analysis of the major causes of death show the following changes (table 1). Before the migration processes, the leading causes of mortality were accidents, injuries and poisonings, followed by tumors and the then, diseases of the circulatory system. However, since the mid 1960s the main cause of death was cardiovascular diseases (also in Russia overall). Death from external causes shifted to second place, and then.

Analysis of the main causes of the Yakutia population mortality in the dynamics showed the following changes (Table 1). Before to the migration processes in the structure of the republic population mortality the leading accidents, injuries and poisoning, in second place – tumors and the third – diseases of the circulatory system. However, since the mid 1960s the main cause of the population death began to cardiovascular diseases, as well as in the whole of the Russia. A mortality rate due to external causes has shifted to the second place, and tumors occupied a stable third position.

Table 1.

Mortality by main causes of death in dynamics from 1960 to 2010 in Russian Federation and Republic of Sakha (Yakutia) (number of deaths per 100 thousand population)

Years	1959 / 1960	1964 / 1965	1985	1990	1995	2000	2005	2010
	The coefficient of total mortality							
RF	762,3	694,2	1130	1120	1497,7	1529	1609,9	1419,2
RS (Y)	901,5	859,2	726,7	669,8	979,7	971,4	1020,3	981,2
Including deaths from circulatory diseases								
RF	187,9	194	633,9	617,4	790,7	846,1	908	805,9
RS (Y)	112,1	229	244,9	228,9	341,8	381,7	466,8	469,5
from tumors								
RF	118,9	124,4	172,9	191,8	203	204,7	201,2	205,1
RS (Y)	138,4	131,2	114	122	130,5	132,6	126,3	120,7
accidents, injuries and poisonings								
RF	69,3	77,3	137,6	133,7	236,8	219	220,7	151,7
RS (Y)	150,3	180,2	178,4	164,6	257,7	243,9	230	195,4
respiratory diseases								
RF	99	68,8	79,5	59,3	73,9	70,3	66,2	52,3
RS (Y)	108,3	86,2	65,7	40,8	51,3	43,3	36,4	34,9
from diseases of the digestive system								
RF	34,7	24,7	30,3	28,7	46,1	44,4	65,5	64,4
RS (Y)	45,2	30,9	33,4	26,1	55,5	45,8	46,3	55,7
from infectious and parasitic diseases								
RF	66,2	37,6	17,2	12,1	20,7	24,9	27,2	23,5
RS (Y)	15,2	87,9	27,6	14	20,4	15,2	15,4	11,4

During the period from 1960 to 1990 in the structure of mortality decreased mortality from cancer by 12%, respiratory diseases – 2.5 times , diseases of the digestive system – 42%, and from infectious and parasitic diseases – by 8%. Mortality from cardiovascular diseases has increased in 2 times (from 112.1 to 228.9 per 100 thousand populations). According to the Russian Federation for the period mortality of cardiovascular diseases increased by 3.2 times (from 176.9 to 617.4). Deaths from accidents, poisonings and injuries among population of Yakutia have increased by 9.5% (in Russia by 93%). However, deaths from these causes have always exceeded the figure for the Russian Federation. So, in the early 1960s death rate from accidents, injuries and poisoning in the republic amounted to 150.3 per 100 thousand inhabitants (the Russian Federation – 69.3). Its highest level this figure reached in the early 1980s and in 1995 (251.7 and 257.7 deaths per 100 thousand pers.).

In 1990-2010 the growth rate of total mortality of the republic population exceeded the rate of growth in the Russian Federation. Thus, from 1990 to 2005 the mortality rate in Yakutia has increased in 1,5 times (in Russia by 1.4 times), reaching a high of 10.2 per 1,000 population, mainly due to causes such as circulatory system diseases –in 2 times and 40 % - from accidents, injuries and poisonings. Then, after the adoption by the Government National Project "Health", since 2006 in the dynamics of the population mortality observed reduction in major mortality. During the period of implementation of the "Health" project from 2005 to 2010 total mortality decreased by 3.8% in the country (according to the Russian Federation – 11.9%), mainly due to the reduction in mortality from external causes – by 15% (in Russia – 31%), infectious and parasitic diseases – by 26% (in Russia – by 13.6%), from cancer – by 4%. However, there is an increase two times in mortality from diseases of the digestive organs.

With regard to mortality from diseases of the circulatory system, it is overcome in the country is much slower than in the whole of Russia. If in Russia during this period there is a decrease in mortality from these reasons, this figure is not the downward trend in the country. Thus, the rate of increase in mortality from diseases of the circulatory system in the Republic of Sakha (Yakutia) in the period from 1990 to 2010. They were 3.5 times higher than Russia.

Between 1960-1990 in Yakutia the mortality rate decreased by 25.7%. This period was characterized by a large influx of people of working-age, due to the industrial development of the Northern territories of Yakutia. The total population increased by 2.3 times. However, it changed the ranking of the causes of death. In place of such "traditional" causes of death such as respiratory diseases, diseases of the digestive system, tumors, and infectious and parasitic diseases came new diseases, mainly those of the circulatory system. During this period, deaths from circulatory diseases in Yakutia increased two-fold.

The available statistical sources show the age structure of the population being dominated by people of working age and children as compared with the RF (table 2). Until 1995, children accounted for almost one-third of the total population, and by contrast, people above working age accounted for only about 9%, with the rest of the population being of working age.

Table 2.

The share of age groups in the general population of the Russian Federation and the Republic of Sakha (Yakutia), %

Years	1979	1989	1995	2000	2005	2010
Younger working age (men and women 0-15 yr)						
RF	**23,3**	**24,5**	**22,7**	**19,4**	**16,3**	**16,1**
RS(Y)	**31,8**	**32,6**	**30,2**	**27,5**	**24,2**	**23,3**
In the working-age (men 16-59,women16-54 yr)						
RF	**60,4**	**57**	**57,0**	**60,2**	**63,3**	**62,3**
RS(Y)	**62**	**61**	**60,6**	**62,6**	**65,2**	**64,1**
Above working age (men 60 and more, women 55 and more)						
RF	**16,3**	**18,5**	**20,3**	**20,4**	**20,4**	**21,6**
RS(Y)	**6,2**	**6,4**	**9,2**	**9,9**	**10,6**	**12,6**

During the period 2005-2010 the total mortality rate in the Republic decreased by 3.8% (11.9% in Russia), mainly due to a 15% reduction in mortality from external causes (31% in Russia), infectious and parasitic diseases by 26% (13.6% in Russia). However, there is a doubling of mortality from diseases of the digestive system.

As for mortality from diseases of the circulatory system, the increase in the mortality rate in the Republic between 1990-2010 was 3.5 times higher than in Russia as a whole.

Discussion:

While the majority of the republic population are young, and the highest rates of mortality are within older age groups, the overall mortality rate was low compared to the average. However, the true picture is not so good. If the population structure of Russia is taken as standard, then the standardized mortality is higher than the actual, and that for the whole of the Russian Federation (table 3).

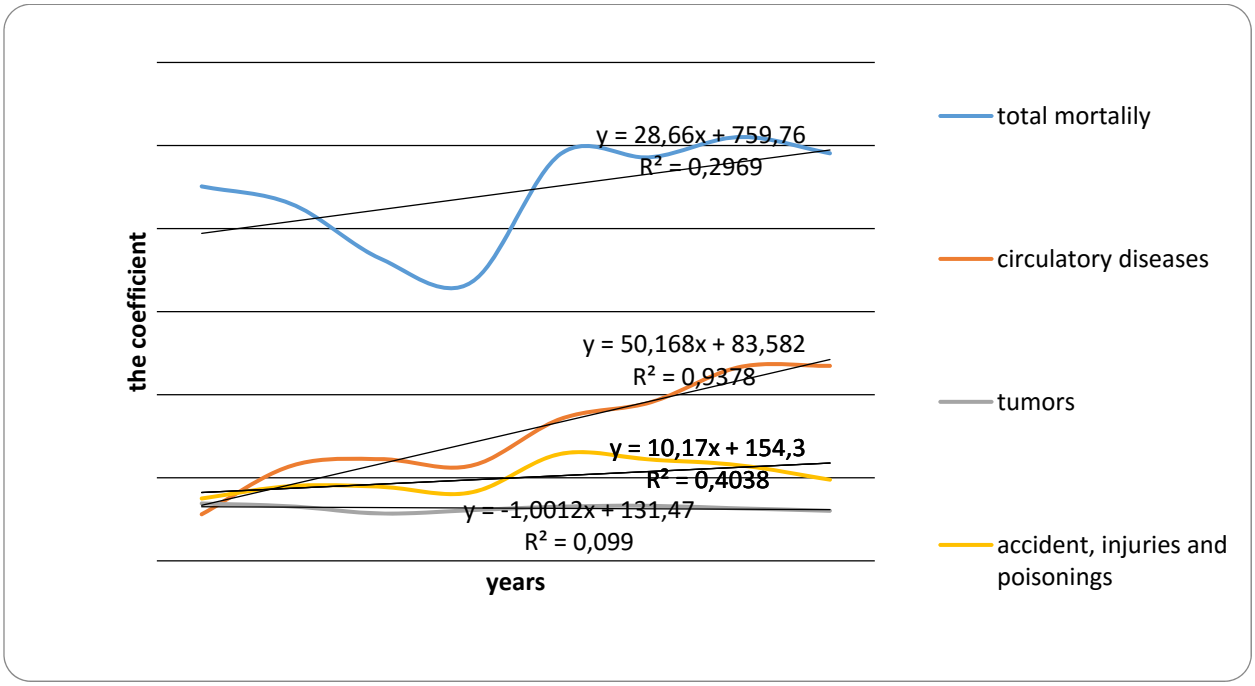
Table 3.

Standardised mortality rates from all causes of death in the Russian Federation and the Republic of Sakha (Yakutia) (number of deaths per 1,000 populations)

Years	2004	2005	2006	2007	2008	2009	2010
RF	**15,0**	**14,9**	**13,9**	**13,1**	**12,9**	**12,3**	**12,3**
RS(Y)	**15,7**	**15,5**	**14,3**	**14,4**	**14,4**	**13,7**	**13,6**

During the last 20 years (1990-2010) the mortality rate increased by 46.5%. This is explained by an outflow of young people, with a consequent decline in the population by 15%. During this period, the age structure of the population changed in favour of people of working age or older, whose numbers increased by 1.5 times, while the absolute number of children decreased by 1.6 times. Overall, the working-age population fell by 10%. Thus, in the republic, as well as in Russia, there was a trend of population ageing. A linear trend in mortality rates indicates that total mortality from diseases of the circulatory system has not had a tendency to decrease.

Linear trend in mortality shows that the total mortality rate of the population, as well as diseases of the circulatory system does not tend to decrease (Fig. 3).



Y - the equationofthe trend linechart

R2 - value ofthe reliability ofapproximation

Fig. 3. Trends of main indicators of mortality among population of Republic of Sakha (Yakutia) in the dynamics from 1960 to 2010

According to forecasts by the Federal State Statistics Service, based on an assessment of the resident population of subjects in Russia by sex and age on January 1 2009, and subject to the Concept of Demographic Policy of the Russian Federation for the period up to 2025, the overall mortality rate of the population will depend on the pace of economic development and increasing well-being of Russian citizens.

Analysis of the dynamics of mortality in the Sakha Republic (Yakutia) is the basis for an evaluation of possible future scenarios (Fig. 4).

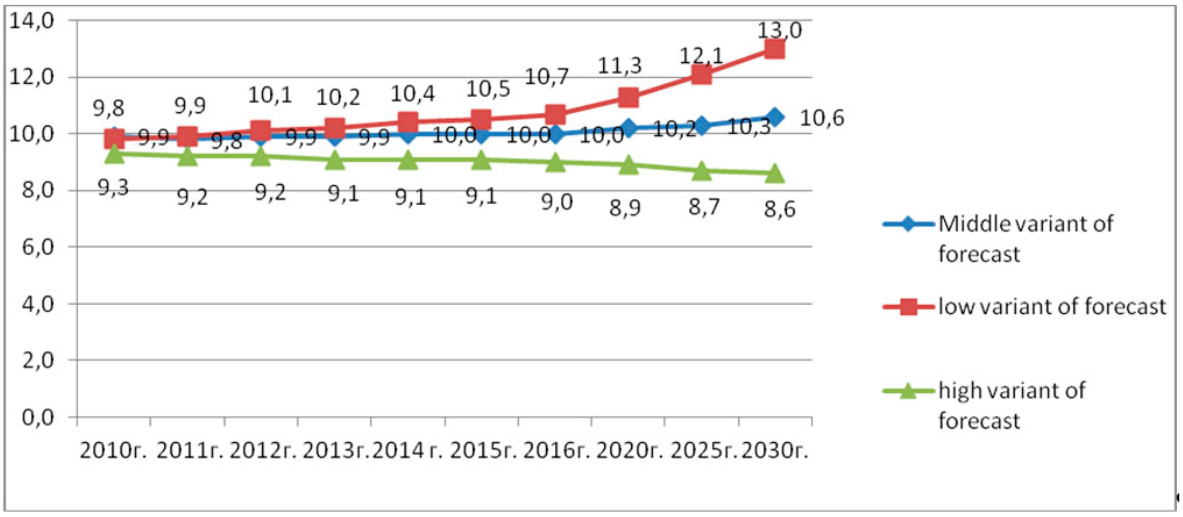


Fig. 4. Forecast the overall mortality rate of the Yakutia population (number of deaths per 1000 population)

A low (pessimistic) scenario considers the deterioration of the socio-economic climate, and results in mortality rates in the Sakha republic (Yakutia) increasing by 1.4 times to reach 13.0 cases per 1000 population by 2030. The middle scenario assumes a slower development of the country so that the mortality rate will remain at a consistently high level. A high (optimistic) scenario, assumes an improving socio-economic situation in Russia, and that the measures designed to reduce mortality identified in the Concept of Demographic Policy of the Russian Federation until 2025, and the priority national project "Health" are successful. This results in a reduction in the mortality rate to 7.5% by 2030.

In cconclusions, mortality is the best recorded and the most informative indicator of the state and dynamics of public health. It is no less useful than other public health indicators, and proves to be very sensitive both to the political reforms in the country and to the state of social and economic conditions. Changes in mortality reflect the number and age structure of the population, which in turn reflects changing migration patterns. Due to the increase in the working age population there was a decrease in mortality within the republic, and subsequently a decrease in the working age population increased mortality rates. During this period there was a change in the rank structure of mortality. In place of such "traditional" causes of death as respiratory diseases, digestive system, tumors, infectious and parasitic diseases have come new, mainly diseases of the circulatory system. Mortality from cardiovascular diseases in the republic increased by 4 times. The long-term forecast of population mortality rate depends on the pace of economic development and well-being of Russian citizens.

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EPIDEMIOLOGICAL ASPECTS OF HEMOBLASTOSIS IN THE REPUBLIC SAKHA (YAKUTIA)

ABSTRACT

Analyzed results of 1780 morbidities with lymphatic and blood-forming tissue malignant tumours of the Republic Sakha population in the period of 1991-2010 are presented. Most of them 968 (54.4%) are men and 812 (45.6%) are women. Morbidity of men and women of all ages with hemoblastosis had a tendency to increase. Populous, territorial and temporal morbidity regularities are set up.

Keywords: hemoblastosis, prevalence, dynamics, prognosis.

PREFACE

Cancer pathology is referred to the most significant problems of modern medical science and practice because of its morbidity and mortality tendency to go up in many countries [3].

About 0.5 mln new cases of MT were registered in 2010 in Russia, that is by 15.1 % higher than in 2000 (449 th.) including 24.6 thousand new patients with haemoblastosis. A general increase tendency of MT morbidity is characteristic for blood system tumour. In 2000-2010 increase by 18.9% of haemoblastosis morbidity, including 15.7 % of men and 21.9 % of women is registered in Russia. In a general structure MT morbidity of men haemoblastosis is in the 7th place and of women in the 9th place (accordingly 4.5 and 5.9 %) [2].

In CIS a number of new patients is rather different: 3% in Kyrgystan, 11% in Uzbekistan. A maximum average age of people suffering from lymph was in Byelorussia [56], in Russia [54], a minimum age in Azerbaijan [43], in Kyrgystan [45]. According to the official 2008 data in Russia a portion of haemoblastosis was rather high in both men and women groups including lymphleukoma (23.6 %), lymph-reticulum sarcoma (29.6 %) and lymphgranularmathosis (13.2 %).

Leukemia was in the 1st place (30.1% - boys and 29.3% - girls), lymph was in the 3d place (14.5 and 10.3%) in the morbidity structure with MT among children. In the age group of 15-39 lymph was in the 1st place among men MT (16.9%) and women MT in the 3d place (9.3%). The highest data are registered in Magadan (15.4 -100000 men, 8.2- 100000 women, minimum data - the Jewish Autonomous Region (2.5 and 1.7- 100000 people [1]).

RESEARCH AIM. To find out temporal, territorial, populous regularities of lymphatic and blood-forming tissue MT morbidity of the population living in severe climatic conditions of Yakutia.

MATERIALS AND METHODS

During a twenty-year analysis (1991-2010) a general increase of patients with the first diagnosis of MT is 17.8% (1668 patients in 1991 and 2030 patients in 2010) including 12.9% of men and 22.5% of women. Dispensary documents of 37380 patients, out of them 1780 (4.76 +- 0.03) with lymphatic and blood-forming tissue MT were analyzed. Most of them were men 968 (54.4%), women-812 (45.6%). The twenty-year analysis (1991-2010) of haemoblastosis morbidity allowed to find out the main tendency of dynamics and to prognosticate its possible characteristic till 2020. The morbidity prognosis was done with the help of MS EXCELL 40 program.

RESULTS AND DISCUSSION

Frequency of haemoblastosis in oncologic morbidity in the Republic Sakha (Yakutia) differs in a wide range (3.7-5.8%) taking the 6th position (4.7%) after MT of lungs (17.8%), stomach (11.5%), mammary gland (8.12%), liver (7.12%) and gullet (6.15%).

Among 37.4 th. patients with the first MT diagnosis 910 (2.43 ± 0.04%) patients (in average 45 patients a year) consulted about lymph: lymph-reticulum sarcoma - 408 (1.09 ± 0.02), lymphgranularmathosis (Khodzkin disease) - 303 (0.81 ± 0.02) and multiple myelitis -199 (0.53 ± 0.02). Among the patients with malignant lymph there were men (56.0%) and women (44.0%).Table 1,Picture 1.

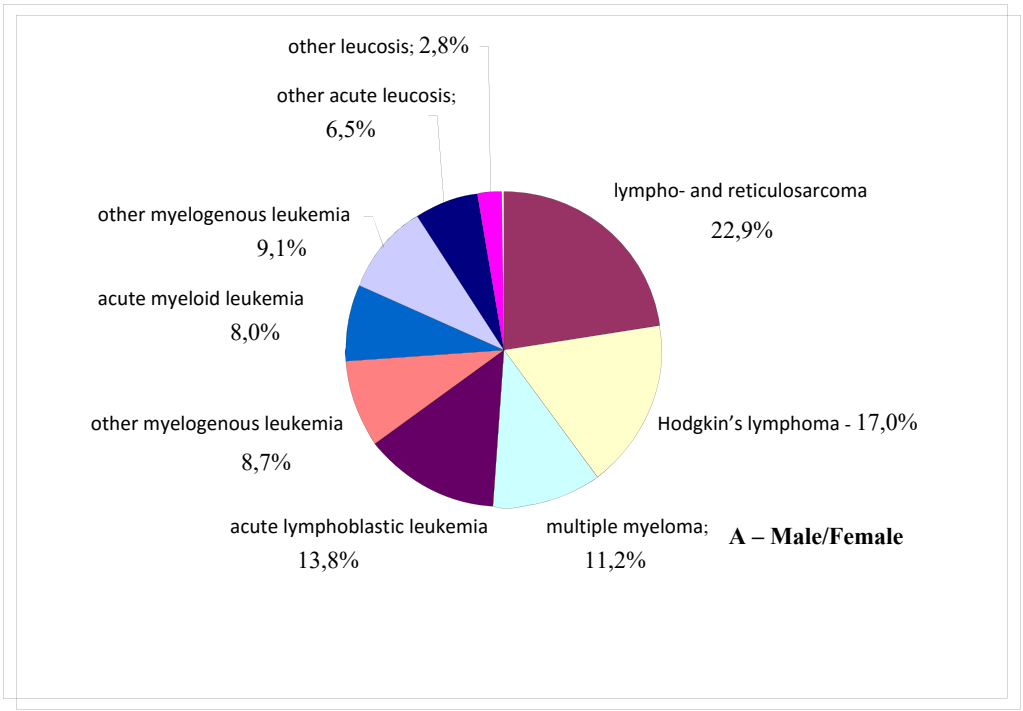
Table 1

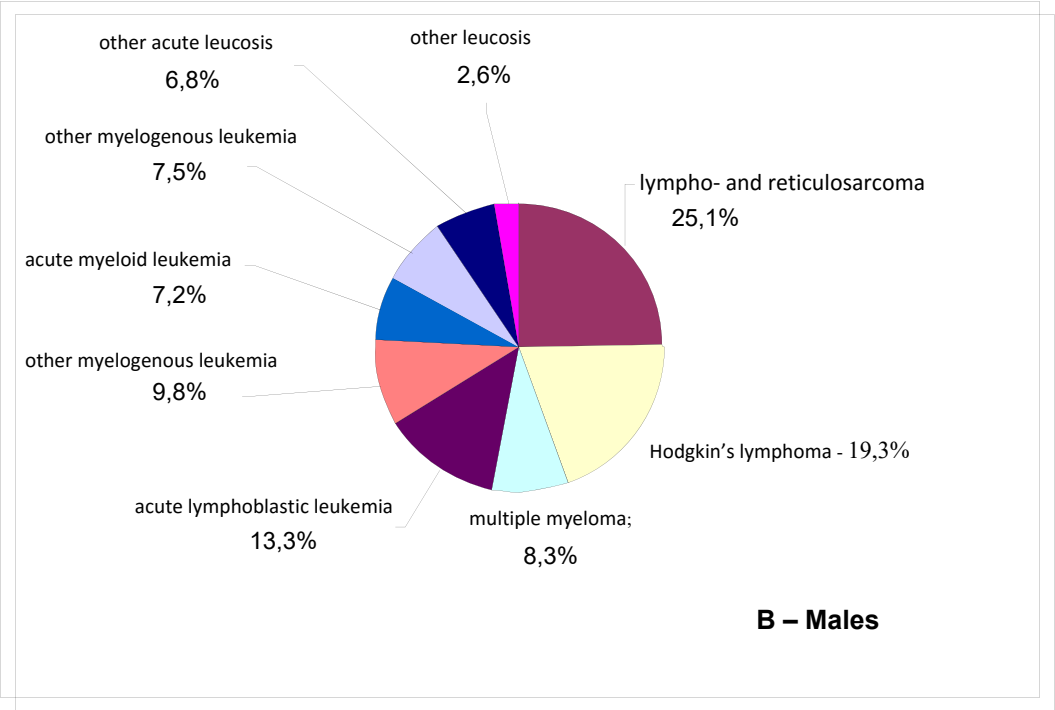
Structure dynamics of the Republic Sakha (Yakutia) population morbidity with malignant tumour in the period of 1991-2010 (Population 100.000)

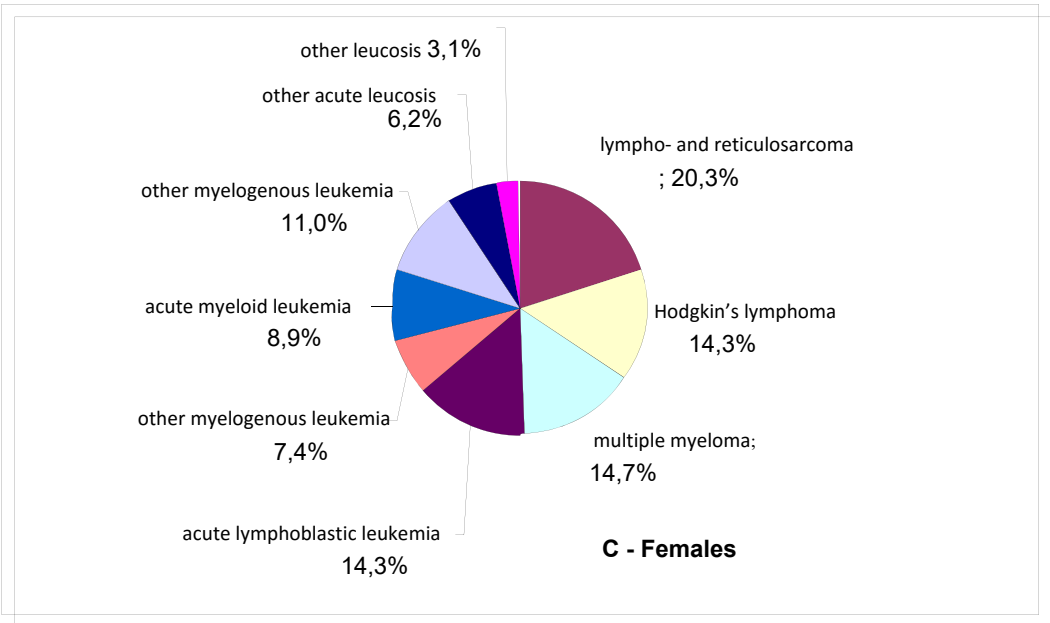
Localization (ICD-10)	1991-2010	Including:	
		1991-2000	2001-2010
All Population			
All neoplasms (C00-97)	37380(100,0)	17781(100,0)	19599(100,0)
Including:			
Haemoblastosis total	1780(4,76±0,03)	789(4,44±0,03)	991(5,06±0,03)
Including: – lymphoma	910(2,43±0,04)	421(2,37±0,04)	489(2,50±0,04)
lympho- and reticulosarcoma	408(1,09±0,02)	170(0,96±)	238(1,21±0,03)
Hodgkin's lymphoma	303(0,81±0,02)	178(1,00±0,02)	125(0,64±0,02)
multiple myeloma	199(0,53±0,02)	73(0,41±0,01)	126(0,64±0,02)
leukemia	870(2,33±0,05)	368(2,07±0,03)	502(2,56±0,04)
acute lymphoblastic leukemia	245(0,66±0,02)	113(0,84±0,02)	132(0,67±0,02)
other lymphatic leukemia	155(0,41±0,01)	42(0,24±0,01)	113(0,58±0,02)
acute myeloid leukemia	142(0,36±0,01)	81(0,46±0,02)	61(0,31±0,01)
other myelogenous leukemia	162(0,43±0,02)	53(0,30±0,01)	109(0,56±0,02)
other acute leucosis	116(0,31±00,01)	66(0,37±0,01)	50(0,26±0,01)
other leucosis	50(0,13±0,01)	13(0,07±0,01)	37(0,19±0,01)
Males			
Including:	18863(100,0)	9155(100,0)	9708(100,0)
Including:			
Haemoblastosis total	968(5,15±0,16)	426(4,73±0,67)	542(5,59±0,23)
Including: lymphoma	510(2,71±0,12)	235(2,60±0,16)	275(2,83±0,17)
lympho- and reticulosarcoma	243(1,29±0,08)	96(1,10±0,10)	145(1,49±0,12)
Hodgkin's lymphoma	187(1,01±0,07)	112(1,23±0,11)	75(0,77±0,09)
multiple myeloma	80(0,41±0,05)	25(0,27±0,05)	55(0,57±0,08)
leukemia	458(2,44±0,11)	191(2,13±0,14)	267(2,75±0,17)
acute lymphoblastic leukemia	129(0,67±0,06)	58(0,62±0,08)	71(0,73±0,09)
other lymphatic leukemia	95(0,49±0,05)	26(0,28±0,05)	69(0,71±0,09)
acute myeloid leukemia	70(0,36±0,04)	40(0,41±0,06)	30(0,31±0,06)
other myelogenous leukemia	73(0,39±0,04)	21(0,26±0,05)	52(0,54±0,07)
other acute leucosis	66(0,39±0,04)	37(0,48±2,07)	29(0,30±0,06)
other leucosis	25(0,13±0,03)	9(0,09± 0,03)	16(0,17±0,04)

Females			
All neoplasms (C00-97)	18517(100,0)	8626(100,0)	9891(100,0)
Including:			
Haemoblastosis total	812(4,30±0,15)	363(3,79±0,19)	449(4,63±0,21)
Including: lymphoma	400(2,15±0,10)	186(1,99±0,14)	214(2,21±0,15)
lympho- and reticulosarcoma	165(0,87±0,07)	72(0,75±0,09)	93(0,96±0,10)
Hodgkin's lymphoma	116(0,63±0,06)	66(0,71±0,08)	50(0,52±0,07)
multiple myeloma	119(0,65±0,06)	48(0,53±0,07)	71(0,73±0,09)
leukemia	412(2,25±0,11)	177(1,97±0,14)	235(2,42±0,16)
acute lymphoblastic leukemia	116(0,62±0,06)	55(0,59±0,08)	61(0,63±0,08)
other lymphatic leukemia	60(0,31±0,04)	16(0,16±0,04)	44(0,45±0,07)
acute myeloid leukemia	72(0,40±0,05)	41(0,46±0,07)	31(0,32±0,06)
other myelogenous leukemia	89(0,48±0,05)	32(0,35±0,06)	57(0,59±0,08)
other acute leucosis	50(0,30±0,04)	29(0,36±0,06)	21(0,22±0,05)
other leucosis	25(0,13±0,03)	4(0,04±0,02)	21(0,22±0,05)

Fig. 1. Structure of annual morbidity with lymphatic and blood-forming tissue malignant tumours of the Russian Federation (1991-2010).







In both groups 870 patients (2.33 ± 0.05) had leukemia, 245 (0.66 ± 0.02) had acute leukemia, 155 (0.41 ± 0.01) – other lymphleukemias, 142 (0.36 ± 0.01) – acute myelitisleukemia, other acute leukemias-116 (0.31 ± 00.01), 50 (0.13 ± 0.0) - other leukemias.

Populous characteristic of other nosological forms of haemoblastosis of men and women among other locations is rather interesting. Thus, men had a lymph 1.3 times more frequently (2.71 ± 0.12%) than women (2.15 ± 0.10%), lymph-reticulum sarcoma 1.5 times (accordingly 1.29 ± 0.08 and 0.63 ± 0.06%). Frequency of multiple myelitis was exception where coefficient - 1:15 (0.41 ± 0.05 and 0.65 ± 0.06%) was found out.

Comparative MT morbidity analysis of man and woman lymphatic and blood-forming tissue singled out a higher lymph level of men than of women (accordingly 2.71 ± 0.12 and 2.15 ± 0.10) ($p<0.05$), at the

same time coefficient difference of morbidity with leukemia is not expressed brightly (-2.44 ± 0.11 and 2.25 ± 0..11% p>0.05). Out of some nosological forms of man's leukemia a portion of acute lymphleukemia is higher (0.67 ± 0.06 – men and 0.62 ± 0.06% - women), other lymphs (0.49 ± 0.05 and 0.31 ± 0.04% and other acute leukamias (0.39 ± 0.04 and 0.30 ± 0.04%). Meanwhile acute myelitisleukemia (0.36 ± 0.04%- men and 0.40 ± 0.05%- women) other myelitisleukemias)accordingly 0.39 ± 0/04 and 0.48 ± 0.05%, other leukamias (o.13 ± 0.03 and 0.13 ± 0.03%) are found out more frequently in woman population.

Annual data of the first MT diagnosis of lymphatic and blood-forming tissue and its populous characteristic are presented in Picture 2.

Fig.2. Annual age data of morbidity with malignant tumours depending on a sex (2001-2010)

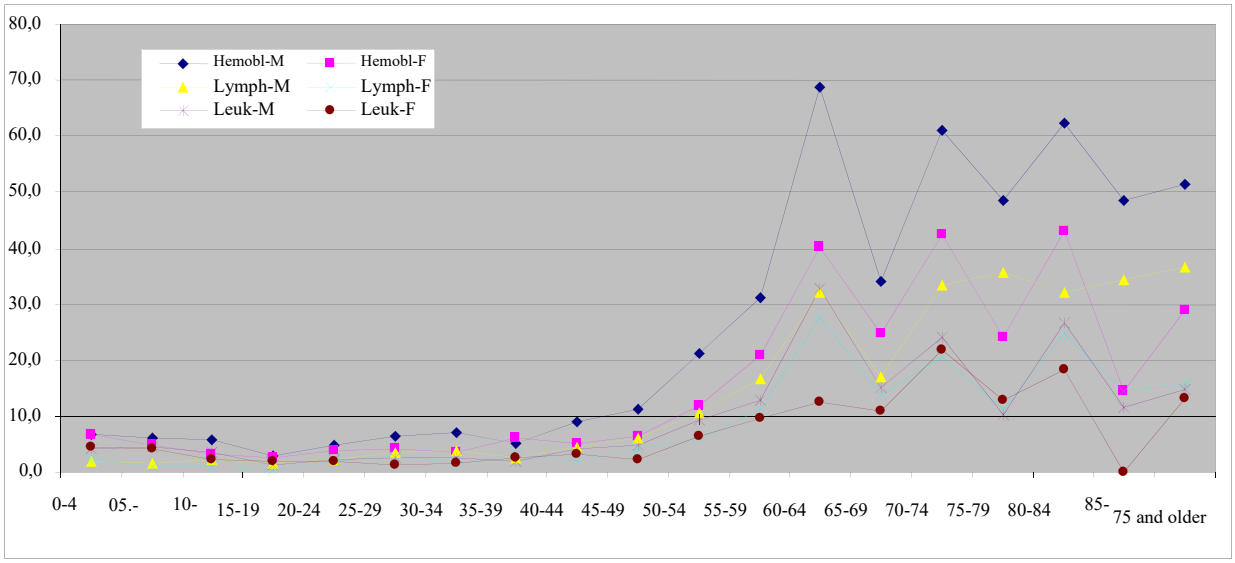
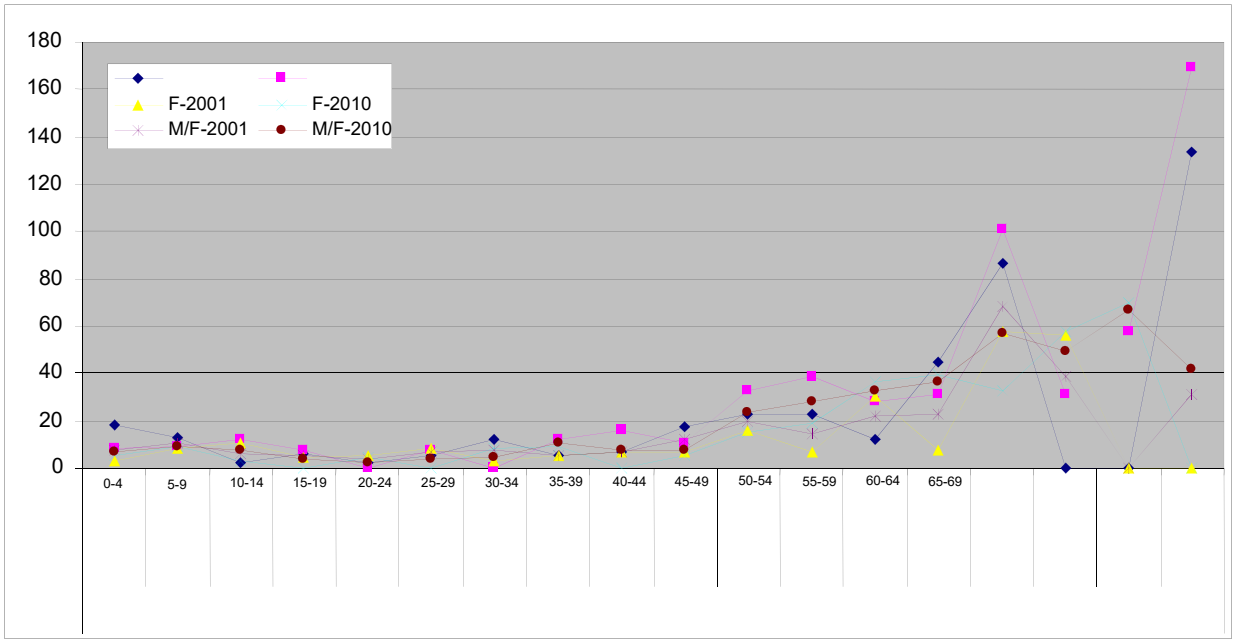


Fig. 3. Morbidity of different age-sex groups of the Republic Sakha population with lymphatic and blood-forming tissue (2001 and 2010) (Population 100.000)



Out of different nosological haemoblastosis forms in both groups due to its data Nekhodzin lymph and other lymphatic MT (22.9%), lymphgranularmathosis (17.0) and acute lymphleukemia (13.8%) occupy the first three places. Coefficients of other MTs decrease: multiple myelitis and immunoproliferative MT (11.2) and other myelitis leukemias (9.1), other lymphleukemias (8.7), acute myelitisleukemia (8.0), other acute leukemias (6.5) and other leukemias (2.8%). Table 2.

Table 2

Structure of morbidity with lymphatic and blood-forming tissue malignant tumours of men and women in the Republic Sakha (Yakutia) (1991-2010) n (o/o)

Localization	Males/Females		Males		Females	
	Republic of Sakha (Yakutia)	Russian Federation*	Republic of Sakha (Yakutia)	Russian Federation*	Republic of Sakha (Yakutia)	Russian Federation*
Haemoblastosis total	1780(100,0)		968(100,0)		812(100,0)	
Including:						
lymphoma	910(51,1)	55,6	510(52,7)	44,0	400(49,3)	57,1
lympho- and reticulosarcoma	408(22,9)	31,1	243(25,1)	31,5	165(20,3)	30,7
Hodgkin's lymphoma	303(17,0)	12,8	187(19,3)	12,5	116(14,3)	13,0
multiple myeloma	199(11,2)	11,7	129(13,3)	9,9	116(14,3)	13,4
leukemia	870(48,9)	44,5	80(8,3)	42,9	119(14,7)	56,0
acute lymphoblastic leukemia	245(13,8)	7,2	458(47,3)	7,8	412(50,7)	6,5
other lymphatic leukemia	155(8,7)	15,2	70(7,2)	16,6	72(8,9)	13,8
acute myeloid leukemia	142(8,0)	6,5	73(7,5)	6,2	89(11,0)	6,7
other myelogenous leukemia	162(9,1)	8,3	95(9,8)	7,8	60(7,4)	8,7
other acute leucosis	116(6,5)	3,0	66(6,8)	3,1	50(6,2)	2,9
other leucosis	50(2,8)	4,3	25(2,6)	4,4	25(3,1)	4,2

In Yakutia men fall ill with lymphs more frequently than women (52.7 % against 47.3 5) because of high morbidity data with Nekhodzin lymph and other MNT of lymphatic tissue (25.1 % against 20.3% -women) and lymphgranularmathosis (19.3% and 14.3%). Meanwhile women fall ill with multiple myelitis and immunoproliferative tumours frequently (4.7%).

In the regional conditions of Yakutia women demonstrated leukemia more frequently (50.7%) than men (47.3%) because of often women morbidity with acute lymphleukemia (14.3% against 13.3%), other myelitisleukemias (11.0 and 7.5%) and other chronic acute leukemias (3.1% and 2.6%).

It's interesting to show the results of comparative analysis of some nosological forms of haemoblastosis MT of different populous groups of the Republic Sakha and the Russian Federation. Thus, in the research period men's data with lymph diagnosis are 1.3:1.0 (here and further data are of the Republic Sakha) – annual of 1991-2010- 52.7% and in the Russian Federation of 2010 – 44.0%) These data are the results of morbidity with lymphgranularmathosis (1.5:1.0), acute leukemias (2.2 : 1.0), acute lymphleukemias (1.7:1.0) and myelitisleukemia (1.2:1.0).

Morbidity with lymphgranularmathosis (1.1:1.0), multiple myelitis (1.1:1.0), leukemia (1.1:1.0), other acute leukemia (2.1:1.0), other myelitisleukemia (1.3:1.0), acute myelitisleukemia (1.3:1.0) is very high in Yakutia in comparison with the Russian Federation.

Comparative analysis of morbidity with lymphatic and blood-forming tissue MT of different sex and age groups of the Republic Sakha population in 2001 and 2010 proves some increase of taken ill people especially of young people (till 19 years old) and older people (more than 50), (PICT.3,TABLE 3). During the research period a high level of average annual increase: men-(2.65% with 11.1 o/oooo in 2001, 14.4 o/oooo in 2010), women- (accordingly-0.75% with 9.5 to 10.2 o/oooo) was observed.

Table 3

Dynamics of morbidity of different age-sex groups with lymphatic and blood-forming tissue malignant tumours of the Republic Sakha population. (2001-2010)

Gender	Year	per 100000 of population																	Index	
		0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-75	75-79	80-85	85 and older	RF*	SF*/
Lymphatic and hematopoietic tissue (C81-96)																					
M/F	2001	7,7	10,5	6,2	5,2	3,8	6,6	7,7	5,1	6,5	12,1	19,4	14,3	22,4	22,5	68,1	38,6	0,0	31,0	10,3	10,7
	2010	6,9	9,0	7,5	3,9	2,2	3,8	4,2	10,4	7,9	7,9	23,4	27,8	33,0	36,3	57,3	49,2	66,5	41,8	12,2	11,9
Male	2001	17,9	13,0	2,0	6,2	2,5	5,1	12,0	5,0	6,5	17,3	23,1	23,0	12,5	44,7	86,5	0,0	0,0	134,0	11,1	13,6
	2010	8,1	8,8	11,8	7,7	0,0	7,6	0,0	12,0	16,2	11,0	32,4	39,1	28,0	30,9	101,0	30,9	57,6	169,2	14,4	15,3
Female	2001	3,1	8,0	10,6	4,2	5,2	8,4	3,2	5,2	6,6	7,1	15,9	6,7	30,3	7,6	57,8	55,9	0,0	0,0	9,5	9,1
	2010	5,6	9,2	3,1	0,0	4,5	0,0	8,4	8,8	0,0	5,0	15,5	18,8	36,8	39,8	32,6	57,8	70,1	0,0	10,2	9,3
Lymphoma (C81-96)																					
M/F	2001	3,1	1,3	1,0	0,0	2,5	2,7	4,6	3,8	3,3	9,7	14,6	10,8	14,0	18,0	18,6	0,0	0,0	31,0	5,1	5,1
	2010	1,4	0,0	1,5	2,6	1,1	2,5	1,4	5,9	4,7	2,6	6,9	13,9	24,0	24,2	36,5	33,3	0,0	1,4	5,8	5,6
Male	2001	9,0	2,6	0,0	0,0	2,5	2,5	9,0	2,5	4,3	12,3	19,8	15,3	12,5	33,6	34,6	0,0	0,0	134,0	6,6	7,9
	2010	2,7	0,0	3,0	5,1	0,0	5,1	0,0	6,0	9,7	2,7	11,8	23,5	14,0	15,4	72,1	30,9	57,6	0,0	7,0	7,2
Female	2001	0,0	0,0	2,1	0,0	2,6	2,8	0,0	5,2	2,2	7,1	9,5	6,7	15,2	7,6	9,6	0,0	0,0	0,0	3,6	3,3
	2010	0,0	0,0	0,0	0,0	2,3	0,0	2,8	5,9	0,0	2,5	2,6	6,3	31,6	29,9	16,3	43,4	23,4	0,0	4,7	4,3
Leukemia (C91,0-95 1-9)																					
M/F	2001	4,6	9,2	5,2	5,2	1,3	4,0	3,1	1,3	3,3	2,4	4,9	3,6	8,4	4,5	49,5	38,6	0,0	0,0	5,2	5,7
	2010	5,5	9,0	6,0	1,3	1,1	1,3	2,8	4,4	3,2	5,2	16,5	13,9	9,0	12,1	20,8	9,8	33,3	41,8	6,4	6,3
Male	2001	9,0	10,4	2,0	6,2	0,0	2,5	3,0	2,5	2,2	4,9	3,3	7,7	0,0	11,2	51,9	0,0	0,0	0,0	4,5	5,7
	2010	5,4	8,8	8,9	2,6	0,0	2,5	0,0	6,0	6,5	8,2	20,6	15,7	14,0	15,4	28,8	0,0	0,0	169,2	7,4	8,2
Female	2001	3,1	8,0	8,5	4,2	2,6	5,6	3,2	0,0	4,4	0,0	6,4	0,0	15,2	0,0	48,2	55,9	0,0	0,0	5,8	5,9
	2010	5,6	9,2	3,1	0,0	2,3	0,0	5,6	2,9	0,0	2,5	12,9	12,5	5,3	10,0	16,3	14,5	46,8	0,0	5,5	5,1

* Rough Figures, */ Standardized Figures

In the period of 1991-2010 haemoblastosis was observed in all age groups not depending on a sex. The most affected group of both populations is age of 50 -55.6% (in the Russian Federation in 2010 - 69.3%). There were 202 patients of the age 0 to 17, that is 12.9% of morbidity with haemoblastosis in the

Republic (in the Russian Federation -7.2%) TABLE 4. Thus, in the regional conditions of Yakutia young people run the risk to fall ill with haemoblastosis more frequently than young people of the same age in the whole country (1.8 times).

According to the analysis by 2020 the data level of morbidity with haemoblastosis will exceed the first level (1991) twice in both groups in the Republic Sakha. TABLE 5.

Extent of lymphatic and blood-forming tissue MT has a brightly expressed medico-geographical, medico-social conditionality. TABLE 6

A high level of haemoblastosis morbidity is found out in Eastern (10.1 o/oooo), Southern (11.3) zones and in big industrial centres (10.4) with developed enterprises of extractive industry and a large number of new-comers. TABLE 7.

In Table 7 analysis of regional data differences of haemoblastosis morbidity is presented taking into account a present-day administrative-territorial divisions of the Republic Sakha territory. The analysis found out the highest data morbidity with lymphatic and blood-forming tissue MT in Aldan (12.3), Anabar (14.9), Verkhnekolymsk (12.1), Tompo (13.1), Lensk (14.2), Mirny (11.7), Neryungri (11.6).

Table 4

Annual morbidity of different age-sex groups of the Republic Sakha population with lymphatic and blood-forming tissue malignant tumours (1991-2010)

Gender	Index		per 100000 of population													
			до 17 л	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75 и ст.
Haemoblastosis																
	n	1 648	212	50	61	67	63	63	90	125	190	193	179	123	130	102
M/F	RF	10,20	3,06	4,02	4,34	5,27	5,22	5,61	6,72	9,13	16,60	26,43	52,28	29,27	51,75	37,50
	%	100,0	12,9	3,0	3,7	4,1	3,8	3,8	5,5	7,6	11,5	11,7	10,9	7,5	7,9	6,2
	n	892	117	25	33	41	42	28	59	75	113	105	101	57	55	42
Male	RF	11,35	3,02	4,35	4,74	6,39	6,93	5,02	9,00	11,38	21,30	31,30	68,66	33,96	60,91	51,40
	%	100,0	13,1	2,8	3,7	4,6	4,7	3,1	6,6	8,4	12,7	11,8	11,3	6,4	6,2	4,7
	n	755	92	21	28	28	22	36	37	49	78	87	83	66	72	55
Female	RF	8,60	2,46	3,56	3,73	4,20	3,45	6,01	5,12	6,51	11,99	20,81	40,14	24,69	42,27	28,90
	%	100,0	21,5	4,9	6,6	6,6	5,2	8,4	8,7	11,5	18,3	20,4	19,4	15,5	16,9	12,9
Lymphoma																
	n	851	63	17	30	43	36	36	45	76	97	106	107	67	67	61

M/F	RF	5,27	1,04	1,19	2,13	3,38	2,98	3,20	3,36	5,55	8,47	14,52	31,25	15,94	26,67	22,43
	%	100,0	7,4	2,0	3,5	5,1	4,2	4,2	5,3	8,9	11,4	12,5	12,6	7,9	7,9	7,2
	n	465	38	13	16	23	25	16	31	42	60	59	50	30	32	30
Male	RF	5,59	1,48	1,41	2,17	3,39	3,90	2,71	4,47	6,02	10,68	16,61	32,10	16,88	33,47	36,71
	%	100,0	8,2	2,8	3,4	4,9	5,4	3,4	6,7	9,0	12,9	12,7	10,8	6,5	6,9	6,5
	n	383	25	4	14	20	11	20	14	32	37	47	57	37	35	30
Female	RF	4,36	0,47	0,97	1,86	3,00	1,73	3,34	1,94	4,25	5,69	11,24	27,57	13,84	20,55	15,76
	%	100,0	6,5	1,0	3,7	5,2	2,9	5,2	3,7	8,4	9,7	12,3	14,9	9,7	9,1	7,8
Leukemia																
	n	797	149	33	31	24	27	27	45	49	93	87	72	56	63	45
M/F	RF	4,93	2,02	2,82	2,20	1,89	2,24	2,40	3,36	3,58	8,13	11,91	21,03	13,33	25,08	16,54
	%	100,0	18,7	4,1	3,9	3,0	3,4	3,4	5,6	6,1	11,7	10,9	9,0	7,0	7,9	5,6
	n	427	79	12	17	18	17	12	28	33	53	46	51	27	23	12
Male	RF	5,13	1,37	2,94	2,30	2,65	2,65	2,03	4,04	4,73	9,44	12,95	32,74	15,19	24,05	14,68
	%	100,0	18,5	2,8	4,0	4,2	4,0	2,8	6,6	7,7	12,4	10,8	11,9	6,3	5,4	2,8
	n	372	67	17	14	8	11	16	23	17	41	40	26	29	37	25
Female	RF	4,24	1,99	2,59	1,86	1,20	1,73	2,67	3,18	2,26	6,30	9,57	12,57	10,85	21,72	13,14
	%	100,0	18,0	4,6	3,8	2,2	3,0	4,3	6,2	4,6	11,0	10,8	7,0	7,8	9,9	6,7

Table 5

Dynamics of morbidity of the Republic Sakha population with lymphatic and blood-forming tissue malignant tumours in 2001 and 2013 and its possible characteristic in 2020 (population 100000)

Year	M/F						Male						Female					
	Hemoblastosis		Lymphoma		Leukemia		Hemoblastosis		Lymphoma		Leukemia		Hemoblastosis		Lymphoma		Leukemia	
	RF*	GS*	RF	GS	RF	GS	RF	GS	RF	GS	RF	GS	RF	GS	RF	GS	RF	GS
1991	6,9	8,6	3,4	4,0	3,5	4,6	7,0	10,3	3,4	4,1	3,6	6,2	6,9	8,0	3,4	4,0	3,4	4,0
1992	8,2	9,2	4,0	4,4	4,2	4,9	8,9	9,9	5,1	5,5	3,8	4,3	7,5	8,3	2,9	3,2	4,6	5,1
1993	8,6	10,2	4,3	4,9	4,3	5,4	9,2	10,6	5,7	6,4	3,5	4,4	8,4	9,4	3,3	3,4	5,0	6,0
1994	7,5	8,7	4,4	5,2	3,1	3,7	8,9	11,3	5,7	7,0	3,2	4,3	6,2	6,8	3,2	3,7	3,0	3,1
1995	7,6	4,6	3,5	2,3	4,1	4,0	8,8	10,5	3,8	4,4	5,0	6,0	6,3	6,8	3,1	3,1	3,3	3,8
1996	6,7	7,7	3,5	3,9	3,2	3,6	8,4	10,5	4,7	5,8	3,7	4,7	5,0	5,5	2,3	2,4	2,7	2,8
1997	6,8	7,4	3,7	4,0	3,1	3,4	7,1	8,1	4,1	4,8	2,9	3,2	6,6	6,8	3,3	3,4	3,3	3,4
1998	6,5	7,0	3,8	4,1	2,8	2,9	7,8	8,5	4,2	4,5	3,6	4,0	5,3	5,5	3,4	3,4	2,0	2,1
1999	7,6	8,3	3,9	4,1	3,7	4,2	7,3	8,5	3,0	3,5	4,2	5,0	8,0	8,0	4,8	4,5	3,2	3,4
2000	7,3	7,2	4,0	3,9	3,3	3,3	8,8	8,9	5,3	5,3	3,5	3,6	5,8	5,1	2,6	2,5	3,2	2,9
2001	10,3	10,6	5,1	5,0	5,2	5,6	11,1	11,8	6,6	6,7	4,5	5,2	9,5	9,3	3,6	3,3	5,8	5,9
2002	7,0	5,6	3,4	3,0	3,7	2,6	7,2	6,7	4,1	3,2	3,1	3,5	6,9	6,6	2,6	2,5	4,2	4,0
2003	13,2	13,8	6,7	6,8	6,4	7,0	14,0	13,6	6,3	5,7	7,8	7,9	12,4	12,7	7,2	7,2	5,2	5,4
2004	7,6	7,6	4,1	4,1	3,5	3,4	9,3	9,0	5,2	4,8	4,1	4,2	6,0	5,8	3,1	2,9	2,9	2,8
2005	12,0	13,0	5,5	6,1	6,5	7,0	13,0	15,0	5,6	6,6	7,4	8,4	11,1	11,1	5,3	5,5	5,7	5,6
2006	7,6	7,9	3,9	4,1	3,7	4,3	9,1	9,8	4,8	5,0	4,3	4,8	6,1	6,0	3,1	3,1	3,1	3,7
2007	11,1	11,4	5,7	5,6	5,5	5,7	12,1	10,5	6,3	5,6	5,9	4,9	10,2	1,0	5,1	4,9	5,1	5,1
2008	10,4	10,5	4,7	4,6	5,7	5,9	12,2	12,5	6,3	6,2	5,9	6,4	8,8	8,3	3,3	3,1	5,5	5,2
2009	12,3	12,2	6,3	6,2	6,0	6,1	14,1	14,7	7,0	6,5	7,2	8,2	10,6	9,9	5,7	5,4	4,9	4,5
2010	12,2	11,7	5,8	5,7	6,4	6,0	14,4	13,5	7,0	6,6	7,4	6,9	10,2	9,3	4,7	4,4	5,5	4,9

2011	12,2	9,6	5,8	5,9	6,4	3,7	11,8	12,8	7,3	8,5	4,5	4,3	9,4	7,7	5,3	4,1	4,1	3,6
2012	10,6	11,1	6,3	5,6	4,3	5,6	11,8	12,6	5,5	5,5	6,3	7,1	11,6	13,5	6,2	7,8	5,4	5,7
2013	11,7	9,9	5,9	5,6	5,9	4,3	13,4	15,7	8,2	10,7	5,2	5,0	8,8	7,1	4,1	3,2	4,5	3,7
2020	**13,6**	**12,2**	**6,8**	**6,3**	**6,8**	**5,8**	**15,2**	**14,7**	**7,8**	**7,9**	**7,4**	**6,9**	**11,5**	**10,2**	**5,9**	**5,4**	**5,6**	**4,8**

*/ RF– Rough Figures, GS– Global Standard

Table 6

Annual morbidity of the Republic Sakha population with lymphatic and blood-forming tissue malignant tumours in the period of 2001-2010 (Population 100000)

Territory Area of Republic of Sakha(Yakutia)	Total		Male		Female	
	RF	GS	RF	GS	RF	GS
Lymphatic and hematopoietic tissue (C81-96)						
Polar	6,14	6,72	5,39	6,66	6,89	6,78
Eastern	10,12	9,88	10,73	12,33	9,46	8,83
Western	6,40	6,99	7,08	7,86	5,75	6,23
Central	7,94	8,80	8,62	9,91	7,27	7,76
Southern	11,32	11,03	13,41	13,81	9,27	8,60
Bigger citties	12,90	13,59	14,83	17,56	11,10	10,92
Republic of Sakha (Yakutia)	10,42	11,02	11,65	13,36	9,24	9,23
Lymphoma (C81-85. 88, 90, 96)						
Polar	3,19	3,35	3,43	3,62	2,95	2,91
Eastern	5,30	4,50	4,67	3,98	5,98	5,17
Western	3,15	3,55	3,54	3,94	2,78	3,13
Central	3,94	4,57	4,36	5,21	3,53	4,01
Southern	6,04	5,69	7,93	8,29	4,19	3,84
Bigger citties	6,24	6,50	7,35	8,81	5,20	5,08
Republic of Sakha (Yakutia)	5,15	5,41	5,92	6,82	4,41	4,39
Leukemia (C91-93, 94.0-5, 7, 95.0-2, 7, 9)						
Polar	2,95	3,09	1,96	2,30	3,94	3,87
Eastern	4,82	5,38	6,07	8,35	3,49	3,66
Western	3,25	3,45	3,54	3,92	2,98	3,10
Central	4,00	4,29	4,26	4,86	3,74	3,75
Southern	5,28	5,34	5,49	5,52	5,09	4,75
Bigger citties	6,66	7,07	7,48	8,75	5,90	5,81
Republic of Sakha (Yakutia)	5,27	5,62	5,73	6,57	4,82	4,85

Table 7

Annual morbidity of the regional population with lymphatic and blood-forming tissue malignant tumours in the Republic Sakha (Yakutia) (2001-2010) (Population 100000)

Ulus (Districts)	Lymphatic and hematopoietic tissue (C81-96)			Из них					
				Lymphoma (C81-90, 96)			Leukemia (C91-95)		
	M/F	Male	Female	M/F	Male	Female	M/F	Male	Female
Abyisky	10,6	4,3	16,4	2,1	0,0	4,1	8,4	4,3	12,3
Aldansky	12,3	15,6	8,8	6,1	7,7	4,5	6,1	8,1	4,1
Allaikhovsky	5,8	5,9	5,8	2,9	0,0	5,8	2,9	5,9	0,0
Amginsky	8,7	12,1	4,5	2,9	6,0	0,0	5,8	6,0	5,6
Anabarsky	14,9	14,9	10,0	2,5	5,0	0,0	9,9	9,9	10,0
Bulunsky	1,0	0,0	2,1	1,0	0,0	2,1	0,0	0,0	0,0
Verkhnevilyusky	5,6	6,7	3,6	1,9	2,9	0,9	2,8	3,8	1,8
Verkhnekolymsky	12,1	17,0	3,6	6,9	10,2	3,5	3,5	6,8	0,0
Verkhoyansky	5,1	5,9	4,4	2,9	4,4	1,5	2,2	1,5	2,9
Vilyusky	6,6	7,3	6,8	5,1	5,6	4,5	1,9	1,6	2,3
Gornyi	2,6	3,6	1,7	2,6	3,6	1,7	0,0	0,0	0,0
Zhigansky	4,6	4,6	0,0	0,0	0,0	0,0	2,3	4,8	0,0
Kobyasky	4,2	4,3	4,2	2,1	1,4	2,8	2,1	2,9	1,4
Lensky	14,2	15,2	9,8	6,5	8,9	4,1	5,9	6,3	5,6
Megino-Kangalasky	8,4	8,2	6,6	3,7	3,8	3,6	3,4	4,4	2,4
Mirninsky	11,7	12,6	9,4	5,5	6,9	4,0	5,5	5,6	5,4
Momsky	10,6	8,6	12,5	4,3	4,3	4,2	8,5	4,3	8,5
Namsky	6,5	8,7	6,5	2,3	1,9	2,7	5,1	6,8	3,6
Neryungrinsky	11,6	15,3	8,4	5,2	6,9	3,7	6,6	8,6	4,7
Nizhnekolymsky	8,4	6,8	10,0	6,7	6,8	6,7	1,7	0,0	3,3
Nyurbinsky	5,8	8,7	2,3	1,5	3,2	0,0	3,9	5,5	2,3
Oimyakonsky	8,2	6,4	10,2	4,8	5,1	4,4	3,4	1,3	5,9
Olekminsky	7,3	8,8	7,8	4,0	4,4	3,6	4,4	4,4	4,3
Oleneksky	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Srednekolymsky	6,0	4,9	7,0	4,8	4,9	4,7	1,2	0,0	2,3
Suntarsky	7,5	5,6	9,2	4,3	2,4	6,1	3,1	3,2	3,1
Tattinsky	10,2	7,4	10,6	4,2	3,7	4,7	4,8	3,7	5,9
Tomponsky	13,1	11,8	12,9	5,2	2,6	7,8	7,2	9,2	5,2
Ust-Aldansky	7,2	6,5	6,9	3,6	4,6	2,6	3,1	1,8	4,3
Ust-Maisky	8,6	8,6	5,4	4,3	3,3	5,4	2,6	5,0	0,0
Ust-Yansky	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Khangalasky	8,3	8,3	8,3	4,0	4,9	3,0	4,3	3,3	5,3

Churapchinsky	9,8	6,3	11,2	7,2	4,2	10,2	1,5	2,1	1,0
Ev-Bytantaisky	14,2	14,4	14,5	3,6	7,2	0,0	10,9	7,2	14,5
Yakutsky	13,8	13,9	12,7	5,8	6,6	5,2	7,1	7,3	7,0
Republic of Sakha (Yakutia)	10,4	11,1	9,3	4,7	5,3	4,1	5,2	5,7	4,8
Russia (2000)	13,7	14,8	12,7	7,2	7,7	6,7	6,5	7,1	6,0

Above mentioned regions refer to the territories with developed gold-, diamond-, coal extractive infrastructure. Similar territorial version is found out in analysis of lymph and leukemia morbidity.

Thus, results of retrospective morbidity analysis of lymphatic and blood-forming tissue MT of the Republic Sakha population stress brightly expressed regional and populous conditionality of haemoblastosis extent. Therefore, the first task in making up a regional program aimed at perfection of onkoepidemiological situation in the region is to work out scientifically based measures of prophylaxis against factor influence of environment and negative moments of anthropogenic origin of haemoblastosis morbidity.

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ANALYSIS OF THE CLINICAL OUTCOMES OF SOME GASTRODUODENAL DISEASES IN YAKUTIA: ICEA1 STRAINS OF HELICOBACTER PYLORI RELATIONS WITH THE EARLY ONSET OF CHRONIC GASTRITIS

The article presents the results of a study of clinical outcomes in patients with several gastroduodenal diseases, depending on the allelic variants of the gene iceA Helicobacter pylori. The iceA1 strains were identified in 65.2% cases and iceA2 – in 34.7% cases. We found no associations according to gender of patients, their place of birth or residence. However, statistically significant differences in the distribution of iceA gene alleles were found depending on age of patients with chronic gastritis. Obtained results may indicate the early onset of chronic gastritis on carriers of iceA1 strains circulating in Yakutia.

SUMMARY

It is known that the clinical outcome of gastroduodenal diseases may depend on the virulence and pathogenicity factors of *Helicobacter pylori* strains. One of these factors is *iceA* gene which has two allelic variants – *iceA1* and *iceA2*. Earlier *iceA1* strains of *H. pylori* were associated with gastric ulcer in some populations of Europe, Asia and America. In Yakutia clinical outcomes of some gastroduodenal diseases depending on virulence and pathogenicity factors of *iceA* gene of *H. pylori* strains previously has not been studied. The aim of this work is to study clinical outcomes in patients with some gastroduodenal diseases depending on the allelic variants of *H. pylori iceA* gene in the Sakha Republic (Yakutia). Study sample totaled DNA samples of *H. pylori* isolated from biopsies of 92 Yakut patients with gastroduodenal diseases confirmed by histological examination (chronic gastritis, ulcers and erosions of the stomach), of which 43 was adolescent and 49 adults. The *iceA1* strains identified in 65.2% cases and in 34.7% *iceA2*. We found no association between strains *iceA1* and *iceA2* in patients with erosions and ulcers ($p > 0.05$), and did not found associations according to the gender of patients ($p>0.05$), and their place of birth or residence (urban or rural population) ($p>0.05$). However in Yakut population in adolescents with chronic gastritis is more common *iceA1* allele (79.0%), than in adults (53.0%) ($\chi^2=6.83$, $p<0.01$). The obtained results may indicate the early onset of chronic gastritis carriers *iceA1* strains, which generally proves more pathogenic properties of *iceA1* strains compared with the *iceA2* strains circulating in Yakutia.

Keywords: *Helicobacter pylori*, chronic gastritis, duodenal ulcer, Sakha Republic (Yakutia), *iceA* gene.

INTRODUCTION

Helicobacter pylori infection (*H. pylori*) has been recognized as the main cause of chronic gastritis (CG). Several epidemiological studies have shown that *H. pylori* infection is also associated with serious gastroduodenal diseases, including with peptic ulcer disease (PUD) and gastric cancer [17]. In 1994, the International Agency for Research on Cancer classified *H. pylori* infection to the I group carcinogen (obvious carcinogens), along with some of the radionuclides, radiation and certain chemicals [28]. The infection remains latent in most patients, and only about 20% of infected individuals develop serious diseases [16]. Manifestations of the diseases probably depend on environmental factors, lifestyle and eating habits, and also likely clinical outcomes can be affected by other factors such as the virulence and pathogenicity of *H. pylori* strains themselves.

At the moment known several virulence and pathogenicity factors of H. pylori associated with the ulcer and gastric cancer which are encoded by genes: *cagA*, *iceA*, *vacA*, *babA* and *oipA* [7, 9, 17, 19, 21, 30]. One of the most important factors of virulence and pathogenicity is *iceA* gene. The first series of studies have shown that the *iceA* gene (induced by contact with epithelium) has two variants – *iceA1* and *iceA2* [5]. The *iceA1* allele associated with gastric ulcer (GU) and duodenal ulcer (DU) [5, 8, 29]. Allelic variant of *iceA2* has no homology with known genes and it is still not clear function of *iceA2* product. Yet, some researchers have linked it with asymptomatic gastritis and non-ulcer dyspepsia [17]. Nevertheless, the role of *iceA* gene remains controversial, since some studies have failed to reproduce the observation of other samples of patients [7, 10, 26, 27, 29].

Earlier in Yakutia were performed researches dedicated on study of gastroduodenal pathology, which were mainly focused on the analysis of changes in the mucous of the antrum, and morphological pattern characteristic of *H. pylori*-associated gastritis in adults, children and adolescents [1-4]. Clinical outcomes of some gastroduodenal diseases, depending on the availability of *iceA* gene *H. pylori* strains, circulating in the Yakutia have not been studied.

The aim of this work is to study clinical outcomes in patients with several gastroduodenal diseases, depending on the allelic variants of *iceA* gene *H. pylori* in the Republic of Sakha (Yakutia).

MATERIALS AND METHODS

Study design

In total 144 patients were examined (mean age 34.97 ± 16.21 years) with gastroduodenal diseases, including 43 adolescents (mean age 15.05 ± 1.41 years) and 101 adults (mean age 43.45 ± 12.42 years). Patients with a previously diagnosis of CG were sent for analysis by doctors (pediatrician, therapist and gastroenterologist) in the endoscopic department of the Republican Hospital №1 – the

National Ministry of Health Medical Center of the Sakha Republic (Yakutia) on fibrogastroduodenoscopy (EGD). During EGD was performed fence gastrobiopsies. Subsequently, gastrobiopsies were sent for histological examination of the gastric mucosa in pathology department of Republican Hospital №1.

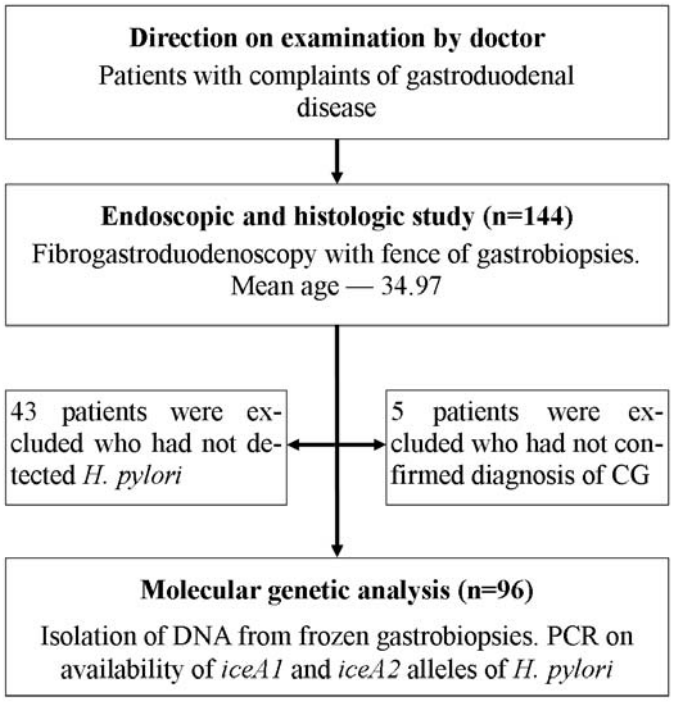

Fig. 1. Scheme of samples formation for molecular genetic assay. Note: CG – chronic gastritis, n – number of patients.

According to results of histological studies, among 144 patients, 43 had not been found *H. pylori* and in 5 patients did not confirm the diagnosis of CG (excluded from further analysis).

Among the remaining 96 patients with confirmed diagnosis of CG (n=46) and CG with erosions and ulcers (n=50) was performed molecular genetic analysis.

Endoscopic and histological examination

Fibrogastroduodenoscopy was held in the morning on an empty stomach. The fence of pieces was made from gastric antrum in an amount of 2-3 biopsies using fiberscope GIF-P3 of the "Olympus" company (Japan).

The obtained biopsy samples of gastric mucosa were fixed in 10% formalin solution. Deparaffinization of shear and staining by hematoxylin and eosin performed according to standard procedures. For sighting microscopy, shears were stained by the Romanovsky-Giemsa method. The study was performed under magnification x100, x400 and x1000 on the microscope "Axioskop" of the

"Opton" company. Morphological criteria of CG evaluated in accordance with the visual analog scale for the modified Sydney system (Houston, USA, 1996).

Molecular genetic analysis

From frozen gastrobiopsies in patients with confirmed histologic diagnosis of CG and CG with erosions and ulcers *H. pylori* genomic DNA was isolated by phenol-chloroform extraction.

Detection of iceA gene Helicobacter pylori

Amplification of the required DNA fragments of *H. pylori* was performed using PCR thermocycler «Bio-Rad». Detection of *iceA* gene was performed using the original sequence of oligonucleotide primers previously proposed (Table 1), which flank DNA region containing the *H. pylori iceA* gene.

Table 1

Design of oligonucleotide primers for *iceA* gene alleles detection

Gen, fragment	Name of oligonucleotide primer	Sequence 5 '→ 3'	Size of amplified fragment	Reference
iceA	*iceA1*	F5'-GTGTTTTTAACCAAAGTATC-3' R5'-CTATAGCCAGTCTCTTTGCA-3'	247 bp	9]
	iceA2	F5'-GTTGGGTATATCACAATTTAT-3' R5'-TTRCCCTATTTTCTAGTAGGT-3'	334 bp	9]

Note: R – any nucleotide

Separation of amplification products was carried in the horizontal electrophoresis chamber in a 3% agarose gel. Visualization of PCR products was performed by gel video documentary device «Bio-Rad» using software Image Lab ™ Software.

Statistical analysis

The results of molecular genetic studies were estimated by the test χ-square using Biostatd software (McGraw-Hill, Inc. Version 3.03). Differences considered statistically significant at $p<0.05$.

Ethical approval

Written informed consent was obtained from all individuals. This study was approved by the local Committee on Biomedical Ethics of the Federal State Budgetary Scientific Institution of the Federal State Budgetary Scientific Institution "YNC CMP" (Yakutsk, Russian Federation, Protocol No 41, November 12, 2015. Decision №5).

RESULTS AND DISCUSSION

In result of endoscopic and histological study from examined 144 patients, 96 individuals have been confirmed diagnosis of CG associated with the presence of *H. pylori*. The *iceA1* allele was identified in 65.2% cases (60 samples), and *iceA2* allele was detected in 34.7% cases (32 samples) (Table 2). Four samples were excluded from the study because three of them were negative on both alleles *iceA1* and *iceA2*, and one sample was positive on both alleles *iceA1* and *iceA2*.

Comparative analysis of *iceA1* and *iceA2* strains depending on the availability of ulcers and erosions

According to the results of molecular genetic studies comparing allele frequencies of *iceA* gene was carried out according to the availability of erosions and ulcers. As a result, no statistically significant differences in the distribution of alleles *iceA* gene between CG and erosions and ulcers were found (χ^2=0.11, p> 0.05) (Table 2). Several authors demonstrated that clinical outcomes with gastroduodenal diseases associated with specific alleles of *iceA* gene *H. pylori* [8, 16, 20, 22]. A recent study based on meta-analysis of *iceA* gene alleles on clinical outcomes showed that the *iceA1* allele was weakly but significantly associated with PUD, particularly DU, while *iceA2* showed no such association [16]. However, there are studies that did not confirm the existence of the association between allelic variants *iceA* gene and clinical outcomes [8, 18, 23, 24, 26, 27, 29]. In our study, also association of *iceA1* alleles with PUD was not received, and probably can be explained due to small number of our sample, or the lack of such association in the Yakut population.

Table 2

Comparison of the frequency of *iceA* alleles depending on the presence of erosions and ulcers, age and sex and demographic factors

Factors	n (92)	*iceA1* (%)	*iceA2* (%)	χ^2	*p*
Dependence on the presence of erosions and ulcers					
CG with erosions and GU/DU	42	27 (64.2%)	15 (35.7%)	0.11	>0.05
CG	50	33 (66.0%)	17 (34.0%)		
Dependence of age					
Adolescences	**43**	**34 (79.0%)**	**9 (20.9%)**	**6.83**	**<0.01**
Adults	**49**	**26 (53.0%)**	**23 (46.9%)**		
Comparison by gender					
Male	42	28 (66.6%)	14 (33.3%)	0.07	>0.05
Female	50	32 (64.0%)	18 (36.0%)		
Comparison on place of residence					
Urban population	12	8 (66.6%)	4 (33.3%)	0.01	>0.05
Rural population	80	52 (65.0%)	28 (35.0%)		

Note: GU/DU – gastric ulcers/chronic ulcers, CG – chronic gastritis.

Comparative analysis of *iceA1* and *iceA2* strains depending on age and gender and demographic factors

When comparing the distribution of *iceA* gene alleles statistically significant differences was not found, depending on the gender of patients (χ2=0.07, *p*>0.05) and also when comparing urban and rural population (χ2=0.01, *p*>0.05) (Table 2). Statistically significant differences in the distribution of *iceA* alleles were found among adolescents, where *iceA1* allele was identified in 34 cases out of 43 (79.0%) and in adults *iceA1* allele detected much less frequently, in 26 cases out of 49 (53.0%) (**χ^2=6.83,**

***p*<0.01**) (Table 2). In our study association of *iceA1* allele was received with early onset of CG, which in general can confirm the more pathogenic strains of properties *iceA1*. This association with age was previously shown in Tunisia, where they were obtained statistically significant differences between adolescent and adult patients [25]. However, the average age of patients in Tunisia (39.9, from 2 years to 88 years) was slightly higher than in Yakutia (29.8 years in age rank between 13 to 67 years). In similar studies associations with age on *iceA* gene has not been shown.

Comparative analysis of *iceA1* and *iceA2* strains on the degree of contaminations and intensity of inflammation

Clinical outcomes of patients with CG were evaluated by comparing the allelic variants according to the degree of contamination and the degree intensity of inflammation.

According to the degree of contamination in a sample of patients with CG who have been identified ulcers and erosion, as well as in the sample of patients without ulcers and erosions, often observed the first degree of contamination (up to 20 microbial bodies in the field of view). According to the degree of contamination showed general trend in the distribution of *iceA* gene alleles in both groups of patients (Fig. 2, A B).

According to the intensity of inflammation in a sample of patients with CG who have been identified ulcers and erosions, dominated the second degree of intensity (Fig. 2, B). Another picture shows the intensity of inflammation with CG without ulcers and erosions – on the intensity of inflammation distribution trends of occurrence *iceA1* gene alleles and *iceA2* not coincide, since the strains *iceA1* significantly dominated the first degree of intensity of inflammation (Figure 2, D.).

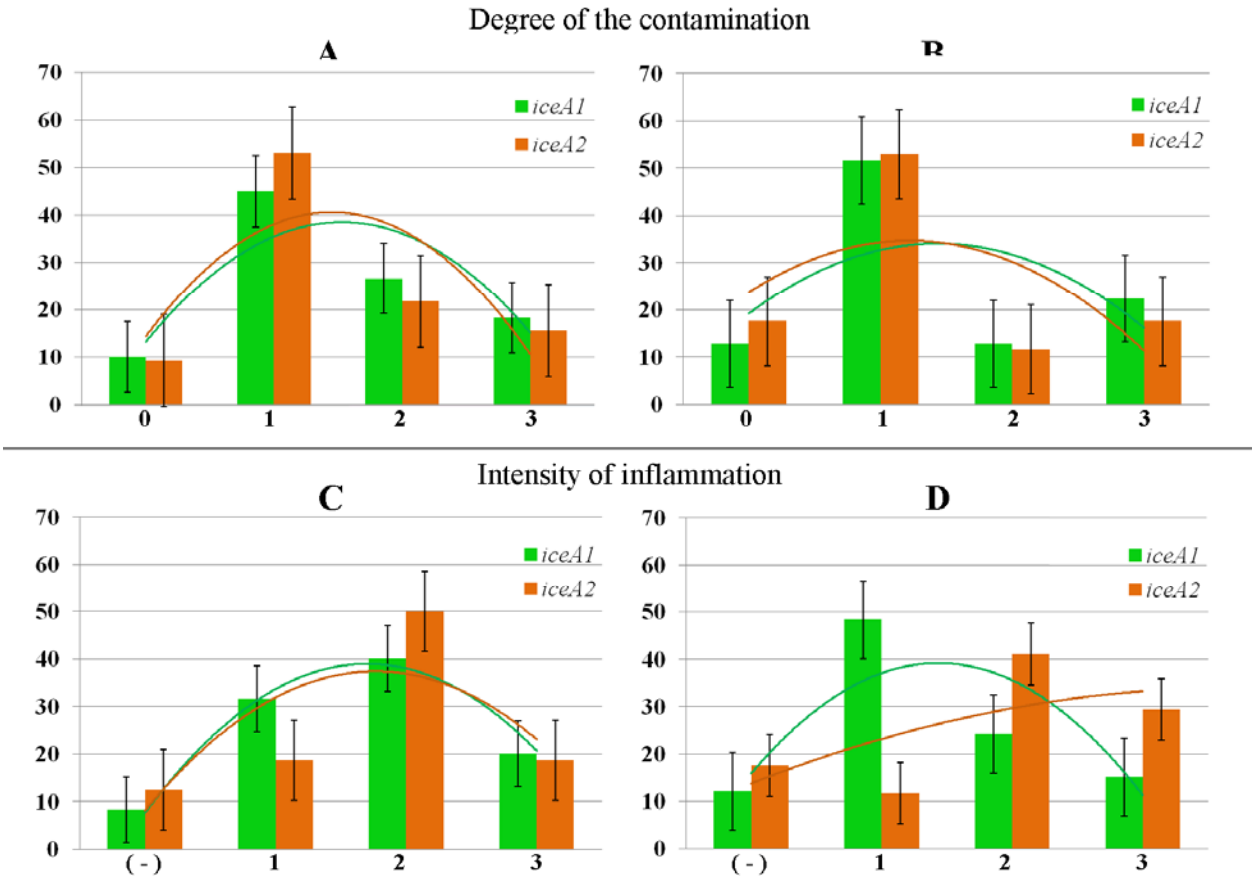

Figure 2. Comparison of allelic variants in the degree of contamination of the sample with the CG and ulcers and erosions with sample with CG to the absence of ulcers and erosions. A, B – CG with ulcers and erosions; B, D – CG without ulcers and erosions. Note: (-) – the absence of inflammatory activity.

Summarizing the comparison of the degree of contamination and inflammation activity we can conclude that in studied sample of patients was found weak intensity of inflammation in patients with *iceA1* strains and vice versa more severe degree of inflammation in *iceA2* In studies of Peek et al. [5] was shown the opposite trend – in patients with *iceA1* strains of *H. pylori* inflammatory infiltration of the gastric mucosa lamina propria were higher than in the presence of *iceA2* [5]. Authors explain this fact that possible *iceA1* genotype is associated with elevated levels of interleukin-8 and, therefore, with a more pronounced immune response to local microorganism [5, 31]. Probably weak inflammatory intensity in patients we studied colonized by *iceA1* strains of *H. pylori* can be explained as the structural features of genes and features in Yakut patients immune system. Obtained data about mismatch of inflammation intensity in carriers *iceA* strains in Yakutia requires further study.

CONCLUSIONS

Thus, we have found that in a population of Yakuts in adolescents with CG is more common *iceA1* allele (79.0%), than in adults (53.0%) (χ^2=6.83, p<0.01). The obtained results may indicate the

early onset of CG carriers *iceA1* strains, which generally proves more pathogenic properties of *iceA1* strains compared with the iceA2 strains circulating in Yakutia.

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WAYS OF REDUCTION OF DAIRY ALLERGY IN YAKUTIA BY GENOTYPING OF BETA-LACTOGLOBULIN GENE

ABSTRACT

In order to reduce the incidence of milk allergy among residents of Yakutia, Russia we studied an allelic and genotype variation of beta-lactoglobulin gene of cattle breed in the Republic of Sakha (Yakutia). Allele distribution analysis of beta-lactoglobulin gene among the studied breeds demonstrated that the frequency of allele B prevails in Kholmogor cattle, local selection of Simmental cattle and especially in Kalmyk cattle. The genotype associated with the low content of milk serum proteins, and therefore hypoallergenic milk is BB genotype. This genotype was observed in 67% of cows of Kalmyk breed and in 43% of cows of local Simmental breed.

The use of marker-assisted selection in dairy cattle will facilitate the increase in number of individuals with BB genotype of beta-lactoglobulin gene which is critical for the reduction of incidence of atopic allergies in the Republic of Sakha (Yakutia).

Keywords: Beta-lactoglobulin, genotyping, allergy, dairy cattle.

INTRODUCTION

Recently the world medical statistics indicates the growth of many allergic diseases. This is primarily connected to a number of factors promoting global allergization of the population: ecological deterioration, increased interaction of the population with chemicals, malnutrition, and consumption of food products with additives, the growing urbanization, changing in lifestyle, stress and increased consumption of medicines [7].

According to the Republic's Skin and Venereal Diseases Dispensary for the last decade atopic dermatitis is the most common type of dermatitis among children of age of 0-14 years. Allergic reaction to food products is a very common issue, especially milk allergy is widely represented among adults and children. The intolerance to cow's milk and other dairy products can be caused by many different abnormalities in carbohydrate, fat and protein catabolism. However, milk allergy is primarily caused by protein components. The major allergens of cow's milk are such components of milk serum as beta-lactoglobulin, albumin, alpha-lactalbumin, lactoferrin and immunoglobulins [5]. To reduce the allergic effect, milk is often exposed to heat inactivation, however harsh and prolonged heating decrease the nutritional value of the product. Thus, other methods of lowering the allergic effect of milk should be considered. One such method is based on production of milk with low content of beta-lactoglobulin facilitated by marker-assisted selection.

All milk proteins are characterized by the presence of genetically determined polymorphic variants with the difference in one or several amino acids, caused by nucleotide change in different alleles of a single gene. The most common variants of beta-lactoglobulin gene are *LGB A* и *LGB B,* which differ in two amino acid substitutions Asp 64 (LGB A) – Gly 64 (LGB B) и Val 118 (LGB A) – Ala 118 (LGB B) and are encoded in different alleles of the gene. The allele B of beta-lactoglobulin gene is associated with high content in casein proteins and fat, while A variant is characterized by high content of serum proteins [4].

Restriction Fragment Length Polymorphism Analysis of PCR-Amplified Fragments (PCR-RFLP) is a powerful method for the analysis of allele A of beta-lactoglobulin gene and it can be used in selection practice as a marker to produce milk with low content of beta-lactoglobulin on every stage of development of the animal [6].

Considering the connection of genes to milk allergy we propose to investigate genotype and allele variability of beta-lactoglobulin gene in cattle being breed in the Republic of Sakha (Yakutia). It is also necessary to study the polymorphism of beta-lactoglobulin gene in imported Simmental cattle of Austrian selection, Kalmyk cattle as well as in Simmental and Kholmogor cattle of local selection.

MATERIALS AND METHODS

In this study we have used the cohort of DNA samples from different breeds of cattle breed in the Republic of Sakha (Yakutia). The cohort included cows of Simmental breed ("Nayahy" and "Ust-Aldan" farms of Ust-Aldan region), Kholmogor breed (Kladovaya Olekmy, LLC, Olekminsk region and "Daiyna" farm of Namsky region), Simmental breed of Austrian selection and Kalmyk breed ("Nemygy agricultural company", Hangalassky region). In total samples from 156 animals of 4 breeds were studied including Simmental breed of local selection (n=86), Kholmogor breed of local selection (n=38), Simmental breed of Austrian selection (n=20) and Kalmyk breed (n=12).

All experimental work was performed in Genetics and Selection Laboratory of Yakut State Agricultural Academy. The blood samples for DNA isolation in the volume of 6 ml were harvested from the Jugular vein into sterile EDTA coated blood collection tubes. Genomic DNA was isolated by standard phenol-chloroform extraction method [3].

The method of Restriction Fragment Length Polymorphism Analysis of PCR-Amplified Fragments (PCR-RFLP) is based on sequence differences between allelic variants of the gene that lead to the absence or presence of specific restriction site, which can be detected and cleaved by certain restriction enzyme. For the analysis of herd structure according to beta-lactoglobulin gene we used the method described elsewhere [8].

For PCR analysis specific primers have been used, structure of which along with the location of restriction sites is presented in **Table 1.**

Table 1

Primers used for the determination of variants of beta-lactoglobulin gene

Gene	Sequence (5'-3')	Endonuclease	Restriction site	Reference
LGB	Forward: GTCCTTGTGCTGGACACCGACTACA Reverse: CAGGACACCGG CTCCCGGTATATGA	HaeIII	GG/CC	Medrano J.F. et al., 1990 [8]

According to the method of herd genotyping developed by Medrano J.F. and colleagues [6] part of beta-lactoglobulin gene is amplified resulting in PCR product with the size of 262 bp. PCR reactions were carried our using Tertsik thermal cycler, Russia. The total volume of the reaction mix was 25 µl, containing 10×Taq Polymerase Reaction buffer -2.5 µl, dNTP mix - 2.5 µl, Taq Polymerase – 0.5 µl , 0.5 µl of each primer, 18 µl of deionized water and 1 µl of sample DNA. PCR temperature conditions are shown in **Table 2**.

Table 2

PCR conditions

Gene	Amplicon size	Length of restriction fragments	PCR conditions
LGB	262	AA: 153, 109 AB: 153, 109, 79+74 BB: 109, 79+74	1. 94°C – 4 min 2. (94°C-1 min; 55°C-1 min; 72°C-1 min)*30 3. 72°C – 5 min

To determine the polymorphism of beta-lactoglobulin gene, PCR probes (20 µl) were treated with 5 units of HaeIII restriction enzyme in specific buffer at 37°C overnight. For product visualization horizontal agorose gel electrophoresis was performed. The gel contained 2% agarose and 0.5 µg/ml of ethidum bromide and was run under 15 V/cm for 50 min in 1×TBE buffer. Following genotypes were distinguished after the electrophoresis: AA with fragment

sizes of 153 and 109 bp, AB with fragment sizes of 153, 109, 79+74 bp and BB genotype with fragment sizes of 109, 79+74 bp (**Fig. 1**).

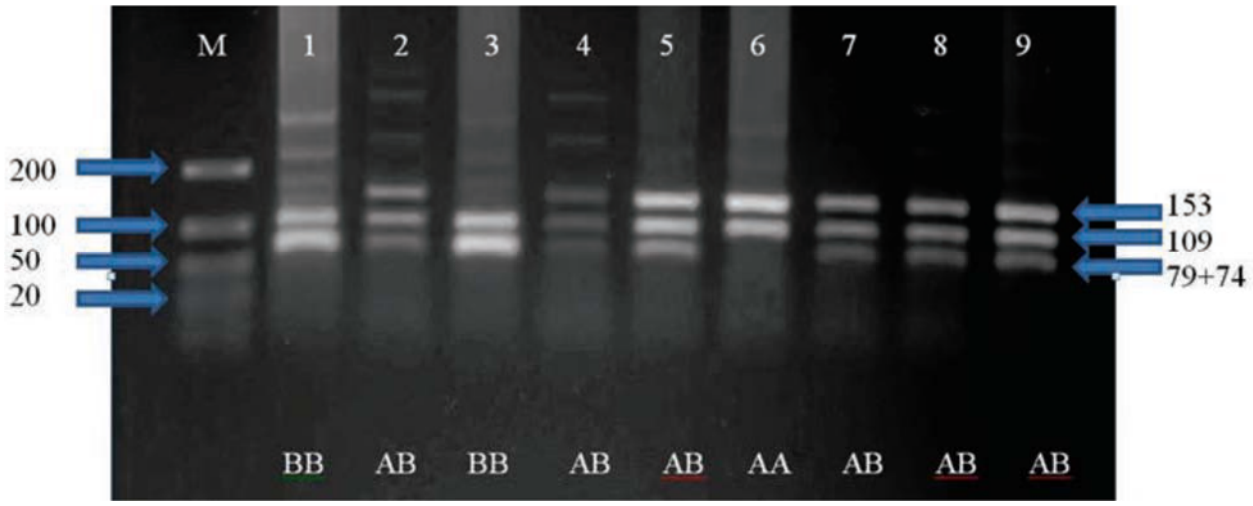

Figure 1. The data of PCR-RFLP analysis. M – Ultra Low Range DNA Ladder (Thermo Scientific); 1, 3 – BB genotype; 2,4,5,7,8,9 – AB genotype; 6 – AA genotype.

RESULTS AND DISCUSSION

With the use of PCR-RFLP analysis of DNA of different breeds of cattle we were able to reveal two alleles of beta-lactoglobulin gene (A and B) (**Table 3**).

Table 3

Frequency of alleles and genotypes of beta-lactoglobulin gene

Breed	Number of animals	Distribution *	AA		AB		BB		Allele frequency		X^2
				%	n	%	n	%	A	B	
Kholomogor breed	38			18	16	42	15	40	0.40	0.60	0.52
			.1	16	18.2	47.9	13.7	36.1			
Simmental breed of local selection	86		1	13	38	44	37	43	0.35	0.65	0.06
			0.5	12.2	39.1	45.5	36.4	42.3			
Simmental breed of Austrian selection	20			30	11	55	3	15	0.58	0.42	0.34
			.7	33.5	9.7	48.5	30.6	18.0			
Kalmyk breed	12			-	4	33	8	67	0.17	0.83	0.40
			,35	,9	,4	8,3	,75	8,8			

*A – actual genotype distribution, E – expected genotype distribution.

The calculations of correspondence of actual genotype distribution to theoretically expected distribution of the locus of beta-lactoglobulin gene revealed that all studied breeds maintain genetic equilibrium.

The frequency of B allele prevails in Kholmogor cows (0.60), local Simmental breed (0.65) and especially in Kalmyk cows (0.83) with the accuracy of $p<0.001$.

Some milk serum proteins cause allergic reaction in human body. It is known that beta-lactoglobulin is the major allergen among all milk serum proteins because it is not produced in human body during lactation.

The genotype associated with the low content of milk serum proteins, and therefore hypoallergenic milk is BB genotype [6]. This genotype was observed in 67% of cows of Kalmyk breed and in 43% of cows of local Simmental breed. Simmental cows of Austrian selection were predominantly represented by AB genotype (55%) and AA genotype (30%) of beta-lactoglobulin gene. AA genotype is not present in Kalmyk cows. AB genotype prevails in Simmental cows of Austrian selection, while local Simmentals were primarily represented by BB genotype of beta-lactoglobulin gene.This could be an indicative of directed selection. Since the majority of farms in the Republic are focused primarily on production of dairy products they prefer breeds of dairy cattle. Kalmyk cattle belongs to beef cattle, thus the selection of the breed was based on improving meat quality. Simmentals of Austrian selection belong to dairy cattle, which selection is based on high milk productivity.

CONCLUSION

The incidence of allele *LGBA* was lower in cattle following breeds - holmogorskoj (40 %) , Kalmyk (17 %) and local Simmental breeding (35 %) . Cows Austrian Simmental breeding , this figure was higher and amounted to 58 % .

The genotype associated with the hypoallergenic milk was observed in 67% of cows of Kalmyk breed and in 43% of cows of local Simmental breed. Simmental cows of Austrian selection were predominantly represented by AB genotype (55%) and AA genotype (30%) of beta-lactoglobulin gene.

The use of marker-assisted selection in dairy cattle will facilitate the increase in number of individuals with BB genotype of beta-lactoglobulin gene which is critical for the reduction of incidence of atopic allergies in the Republic of Sakha (Yakutia).

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MORPHOLOGICAL INVESTIGATIONS OF THYROTROPIC ENDOCRINE CELLS OF RATS ADENOHYPOPHYSIS UNDER EXPERIMENTAL IMMUNOSUPPRESSION

ABSTRACT

Anterior pituitary hormones can change the metabolic activity and function of immune cells; have expressed influence on the immune responses. However, the immune system is able to influence on the endocrine and nervous systems by a principle of feedback. The concept of cellular and tissue mechanisms that underlie the reorganization of the anterior pituitary at immunosuppression, is necessary for a possible correction of the therapy in patients receiving cytostatic drugs for the treatment of autoimmune diseases, cancer, in organ and tissue transplantation. The study of adaptive reserves of the adenohypophysis, depending on age is also actual.

The aim of research was to study the features of structural reorganization of thyrotropic endocrine cells of distal adenohypophysis of rats of puberty at experimental immunosuppression.

Study was carried out on 60 white outbred male rats of puberty. Immunosuppressive condition was modelled in animals by administration of a cytostatic drug cyclophosphamide.

The material was studied by light, electron microscopy, morphometry using the computer appliance, which includes a microscope the Olympus CX-41 and a digital camera Olympus.

It was established that in 1 and 7 days after administration of cyclophosphamide structural changes of thyrotropic endocrine cells show a decrease in their functional activity, which is accompanied by a decrease of the average area of the cells and their nuclei with the simultaneous increase of nuclear-cytoplasmic ratio, a decrease of the relative nucleoli area, relative mitochondria area, and relative secretory granules area.

At 15 and 30 days there are expressed destructive-dystrophic changes of nuclear and cytoplasmic structures of the endocrine cells, accompanied by a decrease in hormone production.

In 60 days after administration of cyclophosphamide despite the restoration of ultrastructure of significant number of cells their secretory activity is still reduced since the percentage of relative area occupied by secretory granule does not reach the control level.

Thus, administration of cyclophosphamide to test animals of puberty causes an active response of thyrotropic endocrine cells of anterior pituitary, as evidenced by the development of polymorphic morphological changes, the nature and the severity of which depends on the terms after administration of cytostatic.

Keywords: rats, anterior pituitary, thyrotropic endocrine cells, immunosuppression.

Background. Lately it was established that anterior pituitary hormones can change the metabolic activity and function of immune cells, have expressed influence on the immune responses [7]. However, the immune system is able to influence on the endocrine and nervous systems by a principle of feedback [1]. Numerous studies have shown that the anterior pituitary is extremely sensitive to the influence of various exogenous and endogenous factors [2, 3, 4]. The concept of cellular and tissue mechanisms that underlie the reorganization of the anterior pituitary at immunosuppression, is necessary for a possible correction of the therapy in patients receiving cytostatic drugs for the treatment of autoimmune diseases, cancer, in organ and tissue transplantation.

Today in scientific literature is almost no information about the features of cytoarchitectonics, ultramicroscopic structure of the anterior pituitary at immunosuppressive condition of the organism. The study of adaptive reserves of the adenohypophysis, depending on age is also actual.

The aim of research was to study the features of structural reorganization of thyrotropic endocrine cells of

anterior pituitary of rats of puberty at experimental immunosuppression.

MATERIALS AND METHODS

Study was carried out on 60 white outbred male rats of puberty. Immunosuppressive condition was modeled in animals by administration of a cytostatic drug cyclophosphamide at a dose which leads to immune depression (200 mg/kg of body weight) [5]. The control rats were given the same volume of 0.9% of sodium chloride solution only. Animals were sacrificed (by decapitation under ether anesthesia) at 1, 7, 15, 30 and 60 days after the injection of cyclophosphamide. Material was investigated by light, electron microscopy, morphometry using the hardware-software complex, which includes a microscope Olympus CX-41 and a digital camera Olympus SP 500UZ with a computer program «Morpholog» [6]. Morphometric studies of distal part of anterior pituitary included the calculation of percentage of different types of endocrine cells, the average cell area, average nuclear area, average cytoplasm area (μm^2), calculation of the nucleo-cytoplasmatic ratio (NCR), the relative nucleoli area, relative mitochondria area, relative secretory granules (active and inactive) area (%) of thyrotropic endocrine cells. Active granules regarded as full, with typical structure, inactive - light, devoid of electron dense substance, as well as partially or completely destroyed. Granules activity index was calculated by the formula: relative active secretory granules area / relative inactive secretory granules area. Statistical processing of data has carried out by the method of variation statistics using Student's t-test. The results were statistically processed using the software package Statistica 6.0 for Windows. Values were considered statistically significant when p was <0.05 (in the text indicated by *).

RESULTS AND DISCUSSION

At the study of the distal part of anterior pituitary of male rats of puberty by light microscopy was established that the cells are characterized by polygonal shape and larger sizes compared with other endocrine cells. Thyrotropic endocrine cells often form the groups consisting of several cells arranged diffusely throughout the gland, but most often they can be observed in the central parts the anterior pituitary near the blood capillaries. In the cytoplasm eccentrically located nucleus, distinct basophilic granulations are determined.

Quantitative analysis of the population of thyrotropic endocrine cells did not reveal significant changes of their number throughout the observation period after the administration of cyclophosphamide.

However, injection of cytostatic drug causes a statistically significant decrease in the average area of thyrotropic cells and their nuclei while increasing of nucleocytoplasmatic ratio in 1, 7, 15 and 30 days of observation (fig. 1).

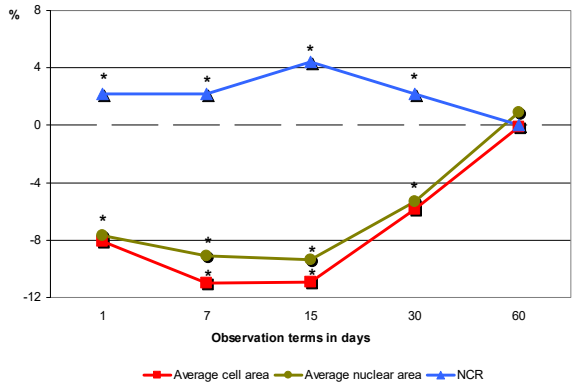

Fig. 1. Dynamic changes in the average cell area, average nuclear area, and NCR (%) of thyrotropic endocrine cells of anterior pituitary of rats of puberty after administration of cyclophosphamide. * p <0.05 (see abbreviations in the text.)

The electron microscopic study found that in one day after administration of the drug in most of thyrotropic cells enlightenment of cytoplasm determined due to a minor amount of the organelles and partial or complete degranulation, which manifested in a decrease of the cytoplasm relative area occupied by secretory granules. Granules activity index is also decreased compared with the data of control group (fig. 2). These signs may indicate a decrease in the functional

activity of thyrotropic endocrine cells in response to cyclophosphamide. There is also a decrease of the relative nucleoli area (1-15 days) and relative mitochondria area in 1-30 days (fig. 3).

Progressive degenerative changes in nuclear and cytoplasmic cell structures, accompanied by a decrease in hormone production and inhibition of intracellular regeneration in the

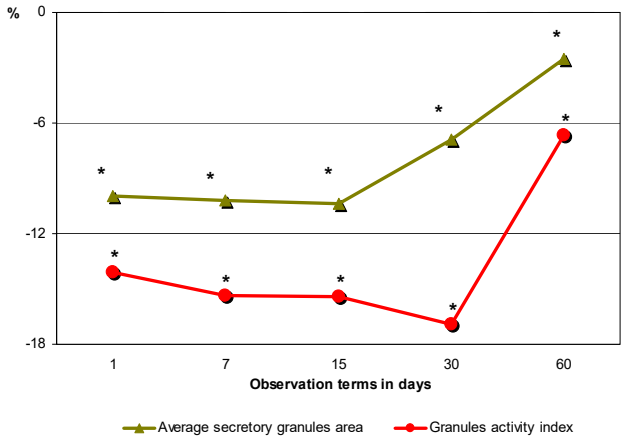

Fig. 2. Dynamic changes in the relative secretory granules area and granules activity index (%) of thyrotropic endocrine cells of anterior pituitary of rats of puberty after administration of cyclophosphamide. * p <0.05.

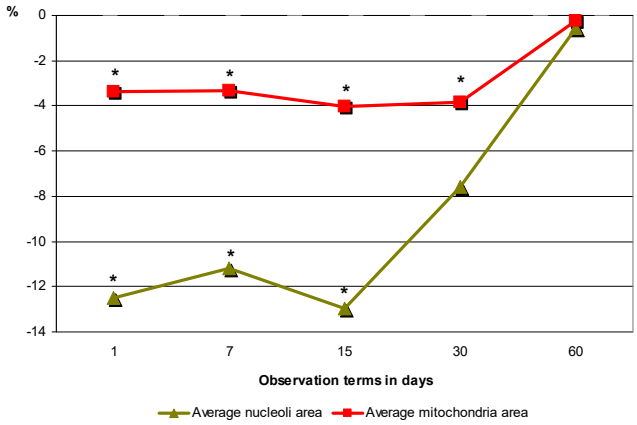

Fig. 3. Dynamic changes in the relative nucleoli area and relative mitochondria area (%) of thyrotropic endocrine cells of anterior pituitary of rats of puberty after administration of cyclophosphamide. * p <0.05.

thyrotropic endocrine cells develop at 7 and 15 day. Typical for ultrastructure of a number of cells in these observation terms is low content of organelles and progressive vacuolization of the cytoplasm. Content of elements of granular endoplasmic reticulum in these cells is greatly reduced; some fragments of cisterns are expanded, are transformed into irregularly shaped vacuoles and contain a small amount of ribosomes on its surface. Extended cistern of remaining dictyosomes of Golgi complex are also involved in the formation of vacuoles of cytoplasm. Reducing the number of mitochondria is accompanied by their significant swelling and destruction of cristae. There are partially or completely damaged mitochondria. The cytoplasm contains a small amount of ribosomes and polysomes, there are isolated lysosomes. Small secretory granules are located as intermittent single-row chains along plasmolemma. By the 30th day after administration of cyclophosphamide progressive vacuolization of the cytoplasm of some thyrotropic endocrine cells results in their transformation into thyroidectomy cells (fig. 4).

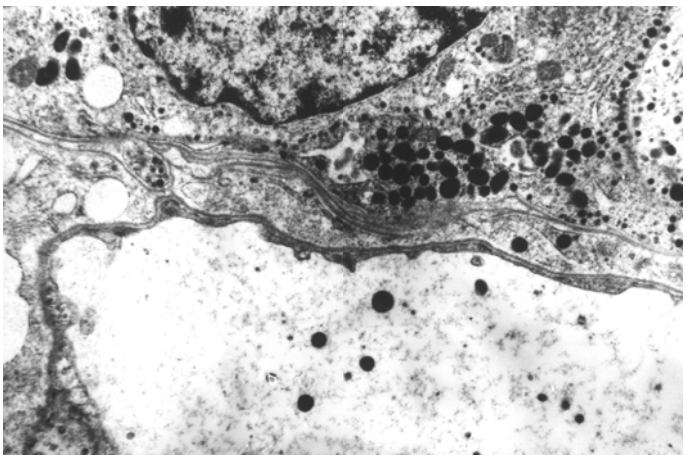

Fig. 4. The distal part of the anterior pituitary of rat of puberty at 30 days after administration of cyclophosphamide: thyroidectomy cell. Magnification x12000.

The merger of small and large cisterns rough endoplasmic reticulum and Golgi complex leads to formation of large cavity filled with flaked material and containing electron dense granules. Along with large vacuoles, in the rest of the cytoplasm revealed many small and medium-sized vacuoles, in which also there are granules. At 60 days after the administration of cyclophosphamide the cells with typical structure of thyrotropocytes are dominated.

CONCLUSION

Introduction of cyclophosphamide to experimental animals of puberty causes an active response of thyrotropic endocrine cells of anterior pituitary, as evidenced by development of polymorphic morphological changes, the nature and the severity of which depends on the observation terms after administration of cytostatic drug.

In the early term of observation (1 and 7 days) after administration of cytostatic structural changes of cells show a decrease in their functional activity, which is accompanied by a decrease of the average cell area, average nuclear area with the simultaneous increase in nuclear-cytoplasmic ratio, a decrease in the relative nucleoli area, relative mitochondria area, and relative secretory granules area.

By the 15th and 30th days there are expressed destructive-dystrophic changes of nuclear and cytoplasmic structures of thyrotropocytes associated with decreased hormone production.

In 60 days after administration of cyclophosphamide despite restoration ultrastructure significant number of cells their secretory activity is still reduced, since percentage of the relative area occupied by the secretory granules does not reach the control level.

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L. K. Soldatova, A. K. Iordanishvili

CHARACTERISTICS OF ANXIETY OF YOUNG PEOPLE SUFFERING FROM DENTOFACIAL ANOMALIES AND UNDERGOING ORTHODONTIC TREATMENT

ABSTRACT

The authors investigated the level of personal and reactive anxiety in young people suffering from dentoalveolar anomalies considering orthodontic treatment techniques (vestibular or lingual braces). It was found that, despite the increased level of personal and reactive anxiety in young people with vestibular braces, there was a low level of anxiety, while in patients using lingual bracket system, a significant increase in the level of personal and reactive anxiety was marked, which can be regarded as moderate anxiety on quantitative evaluation.

Keywords: dentoalveolar anomalies, cadets, young persons, orthodontic treatment, the mental state, personal and reactive anxiety.

INTRODUCTION

All dentofacial anomalies and deformations of the facial skeleton, as well as disfigurement resulted from a car accident or gunfire, negatively affect the mental abilities of a person [3, 4, 7]. It was noted that studying the expression and behavior of a person could help judge his character, temperament, mental development and health [5, 12]. Many researchers have mentioned that persons with distal occlusion are sensitive and those with mesial occlusion, as a rule, strong-willed but short-tempered [11]. Therefore, it is important not only to establish contact and understanding with a young person suffering from a dentofacial anomaly, but also to study his psycho-physiological features: this could help choose the best techniques and methods of treatment.

The purpose of the study is to determine the level of trait and state anxiety in young persons suffering from dentofacial anomalies, taking into account the chosen method of orthodontic treatment.

RESEARCH MATERIALS AND METHODS

The study included 66 young persons aged between 17 and 25 years, students of higher military schools of the Ministry of Defense of the Russian Federation who permanently resided in different parts of Russia. The choice of military students for the study ensured homogeneity of the investigated material [6, 8, 9] with regard to psycho-physiological status, work and rest schedules, physical training and nutrition. The study involved only males.

The individuals were divided into 4 groups. The first group consisted of 15 students without dentofacial anomalies (control group). The second group consisted of 15 students who had dentofacial anomalies of I – II degrees, but underwent no orthodontic treatment. The third group consisted of 25 students who underwent an orthodontic treatment of dentofacial anomalies with the use of vestibular braces for at least 3 months. The fourth group consisted of 11 students who underwent an orthodontic treatment of dentofacial anomalies with the use of lingual braces for at least 3 months.

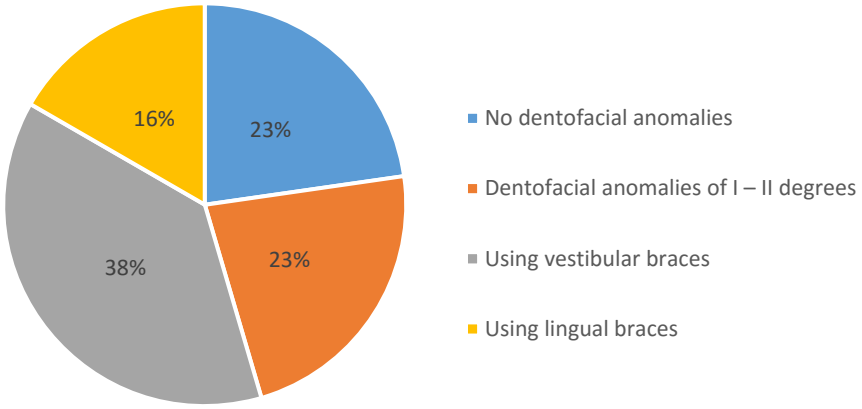

Fig. 1. Students in study groups stratified by dentofacial anomalies and type of orthodontic device, %

The level of trait and state anxiety in all groups was determined using Spielberg-Hanin test [2]. The scores of trait and state anxiety were determined using the method described by A. A. Krydlov and V. P. Sochivko [10]. The assessment of personality levels and state anxiety was carried out using a point system (until 30 points – low anxiety, 30 to 45 points – moderate anxiety, 46 points or more – high anxiety), which has proved its worth for examining dental patients [1].

The digital data obtained from the clinical trial have been processed on a PC using a special package for statistical analysis "Statistica for Windows v. 6.0". The differences between the compared groups were considered significant at $p \leq 0.05$.

RESULTS AND DISCUSSION

During the research and statistical processing of the data obtained from the analysis of the results of Spielberg-Hanin test, no significant differences have been revealed the scores of trait and state anxiety in the first and second groups ($p \geq 0,05$). The students in the first and second groups showed a low level of trait and state anxiety (Fig. 1, 2), despite a high academic and physical load in higher military educational institutions of the Ministry of Defense of the Russian Federation. The score of anxiety was 24.3±2.46 for trait anxiety and 23.4±2.23 for state anxiety in the first group, 22.7±2.02 for trait anxiety and 20.7±3.17 for state anxiety in the second group. This allows to conclude that the dental anomalies in the young persons of the second group negatively affected their level of trait and state anxiety. These findings confirmed the results of previous military-medical examinations of these persons that were carried out to detect dentofacial anomalies (before and during the admission to military higher education institutions), according to the Decree of the Minister of Defense of the Russian Federation No. 505 from 07.09.2015 "On the procedure for military-medical examination in Armed Forces of the Russian Federation" and the Decree of the Government of the Russian Federation № 565 from 04.07.2015 "On approving the Regulations on military-medical examination".

The students of the third group, who used vestibular braces, showed a significant difference as to the level of trait and state anxiety (Fig. 1, 2), compared with the students of the first and second groups ($p \leq 0.05$). However, the scores of anxiety in the third group (28.7±2.18 for trait anxiety and 26.8±2.19 for state anxiety) were typical for low anxiety. At the same time, the students of the fourth group, according to trait and state anxiety scores, showed an increased level of anxiety (35.4±2.12 for trait anxiety and 36.7±2.24 for state anxiety) that is typical for moderate anxiety, in accordance with the established criteria (Fig. 1, 2).

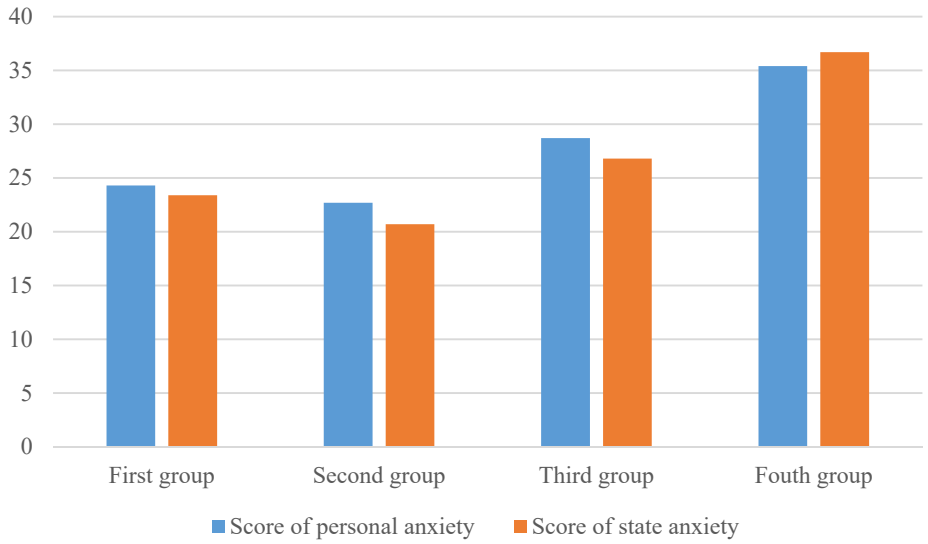

Fig. 2. Anxiety scores of military students, points

CONCLUSION

A clinical trial among military students suffering from dentofacial anomalies and undergoing an orthodontic treatment with the use of braces has established that, despite an increased level of trait and state anxiety, the students with the vestibular braces show a low level of anxiety. At the same time the students who use lingual braces for the treatment of dentofacial anomalies show a proven increased level of trait and state anxiety which can be interpreted as moderate anxiety using quantitative evaluation techniques. It seems that the data obtained should be taken into account when choosing techniques and methods of treatment of dentofacial anomalies in students of higher military educational institutions, due to the specific conditions of their everyday life and military service.

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MAXILLOFACIAL MALIGNANT TUMORS IN YAKUTIA

ABSTRACT

On the basis of retrospective analysis the first documentation of patients having malignant tumour diagnosis of maxillary-facial part for the first time is given. The populous, territorial and temporal regularities of population morbidity in Yakutia are found out.

K**eywords:** maxillofacial cancer, prevalence, dynamics, prognosis.

PREFACE

In the whole world malignant tumours of maxillary-facial part are a rare case. The world statistics suggest the most standardized rate more than 5.0 0/000 (men) and 2.0 0/000 (women) in some provinces of the USA, Canada, France, Italy, India and Australia (2).(IARC,2007). As a whole a proportion of the given malignant tumour among other MTs is not more than 1-2%. Relatively a high level of morbidity in these countries is associated with smoking. In particular smoking turned out to be one of the reasons of maxillary-facial tumour (lips, mouth cavity, gullet), organs of breathing (nasopharynx, nose sinus, larynx, lungs), organs of digestion (gullet, stomach, pancreas), reproductive (cervix of the uterus), urinary organs(urinary bladder, kidney) etc. (1)

In 2010 about 15.300 cases of maxillary-facial malignant tumour were found out in Russia. It was 2.96% out of total number registered malignant tumours, but rough data are 10,7 0/0000 (4).

Actuality of epidemiological aspects of the given problem is connected with cancer of tongue, mucous mouth cavity, mouth-larynx gullet leading to heavy anatomical-topographic changes and functional disorder of organs and tissues. In this case the maxillary-facial malignant tumour is a big social problem especially in thinly populated northern regions of Yakutia . (3.5)

It's important to notice that questions of diagnostics perfection, treatment and prophylaxis are based on epidemiological peculiarities of the malignant tumours. Besides, results of territorial, populous analysis of malignant tumours might be interesting for specialists to work a purposeful, argumentative anticancer program.

RESEARCH AIM is to clear up populous, territorial and temporal regularities of morbidity with malignant tumours of maxillary-facial part of the population in Yakutia.

MATERIALS AND METHODS

The first documents of 800 patients suffering from maxillary-facial cancer in the Republic of Sakha (Yakutia) were analyzed in the period of 2001-2015. It made up 2.6% (In Russia 3.0% in 2010) of registered patients with MT for the first time (30837) in Yakutia at the same period of time. Men made up 70.5%. The ratio between men and women is 2.4:1.0. Calculation is done using an applied program.

RESULTS AND DISCUSSION

Morbidity of the Republic Sakha population has a tendency to increase. Thus, in Yakutia in 2011-2015 annual number of patients having MT for the first time was 2248, it exceeds by 18.1% of the first data of 2001-2005 (1903 men).

Maxillary-facial malignant tumour is characterized by sexual differences (Table 1). It was found out that cancer of tongue, salivary gland, mucous mouth cavity increased from 55.0% in 2001-2005 to 63.7% in 2011-2015 and depended on the rate of growth of the given localization of men (50.0±3.23 and 58.0±2.94% $p<0.05$), while of women was (70.0±2.96 and 73.3±2.64%). With the exception of lip cancer which during a temporal interval frequency went down 2 times (8.5% in 2001-2005, 4.3% in 2011-2015) but it was not so important.

The most affected age of both groups is 50 and elder (lips-79.7%, mouth cavity -84.6%, gullet 82.4%). It's noticed that annual growth of patient number with the first diagnosis witnesses a population ageing. But on the other hand it proves improvement of prophylactic work at places.

Our analysis of the proportion of patients suffering from maxillary-facial malignant tumour of five years found out the growth by 17.1%. It's explained by the growth of elder woman population exceeding by 170.0% of the first level, while man population data are stable.

Dynamics of sexual and age data of maxillary-facial malignant tumour in the period of 2000 and 2014 and its possible structure by 2020 is given in Table 2. Comparison of age morbidity characteristic cleared up that coefficient of men morbidity increases women one depending on age. The maximum age morbidity in both groups is 70 and more.

Data extrapolation of maxillary-facial malignant tumour in the period of 2000-2014 allows to notice that morbidity dynamics depended on a sex in both groups. According to the analysis the prognostic joint data of nozological morbidities of all forms for men will be 2.9 0/0000 or 20.8% in 2020 exceeding the first level (2.4± 0.71 0/0000 in 2000) In the data growth the main role will be given to malignant tumours of mouth-nose-larynx-gullet which will increase by 92.9% of 2000-level (Table 3).

According to the prognosis malignant tumour of maxillary-facial part for women will be 0.9 0/0000 (90% of the 2000-level), the reason is lowering data tongue, salivary gland, mucous mouth cavity cancer from 4.2±0.92 0/0000 in 2000 to 2.8± 0.76 in 2014 (66.7% of the first data).

In Table 4 results of the data analysis of malignant tumour in maxillary-facial part of the Republic Sakha are given. The territory of the Republic Sakha is famous for its severe climate but also for its industrial exploitation of deposits and its migration.

For working out scientifically-based measures for prophylaxis we consider that it's important very much to divide the territory into separate regions and medico- geographical zones to characterize spread of malignant tumour in maxillary-facial part. According to the analysis the highest men morbidity with malignant tumour is shown in Olenek (14.6 o/0000, Kobey (14.2), Aldan (13.8), Verkhnekolymsk (13.6) and Ust-Yana (13.4) and women morbidity in Abyisk (8.2), Nyurba (5.4) and Srednekolymsk (7.0 o/oooo). Most of these regions are gold-diamond-coal extractive industry.

Among six singled out medico-geographical zones relatively a high men morbidity of maxillary-facial MT is found out in Southern (7.25 0/0000) , Eastern zones (6.75) and in industrial centres (6.22), while women MT- in Eastern (4.49), Western (2.77) and Southern zone of Yakutia (3.29). Table 5.

Relatively high cancer data of tongue, salivary gland, mucous mouth cavity are observed in men living in big industrial centres (5.68 0/0000), Eastern (4.67) and Southern zones of Yakutia (3.66) and in women living in Eastern (3.49), Western (1.98) zones of Yakutia and in big cities (2.09 0/0000).

Similar territorial variability is found in analysis of malignant tumour of mouth, nose, larynx-gullet. The highest data are observed in men and women of Southern Yakutia (accordingly 4.88 and 1.79 0/0000) and the polar circle (4.88 and 1.79 0/0000).

In conclusion we stress that unfavorable situation and prognosis of cancer morbidity of maxillary-facial part among the population of the Republic Sakha (Yakutia) demand working out scientifically-based measures of prophylaxis to reveal in proper time and to treat chronic diseases known as a before cancer symptom. It's impossible to diagnose in time and to treat malignant tumor of maxillary-facial part without intensifying activities leading to perfection of population sanitary culture.

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Table 1

Structure dynamics of annual maxillary-facial malignant tumour morbidity of the population in Yakutia (2001-2015) n(m±m%)

Localization (ICD-10)	Total 2001-2015	Including:		
		2001-2005	2006-2010	2011-2015
Male/Female				
Total Malignant Neoplasms (MN) (C00-97) n(%)	30837(100.0)	9515(100.0)	10084(100.0)	11238(100.0)
Including.: Total MN of Maxillofacial area* (C00-14)	800(2,59)	240(2,52)	279(2,77)	281(2,50)
Including: Lips (C00)	68(8,6±0,98)	25(10,4±1,97)	31(11,1±1,88)	12(4,3±1,21)
Tongue and oral mucosa (C01-09)	470(58,8±1,74)	132(55,0±3,21)	159(57,0±2,96)	179(63,7±2,87)
Pharynx (C10-14)	262(32,8±1,66)	83(34,6±3,07)	89(31,9±2,79)	90(32,0±2,78)
Male				
Total MN (C00-97)	15060(100,0)	**4773**(100,0)	4935(100,0)	5352(100,0)
Including.: Total MN of Maxillofacial area* (C00-14)	564(100)	180(100)	208(100)	176(100)
Including: Lips (C00)	57(10,1±0,91)	22(12,2±2,11)	26(12,5±1,98)	9(5,1±1,31)
Tongue and oral mucosa (C01-09)	299(53,0±1,71)	90(50,0±3,23)	107(51,4±2,99)	102(58,0±2,94)
Pharynx (C10-14)	208(36,9±1,55)	68(37,8±3,13)	75(36,1±2,87)	65(36,9±2,88)
Female				
Total Neoplams (C00-97)	15777(100,0)	4742(100,0)	5149(100,0)	5886(100,0)
Including.: Total MN of Maxillofacial area* (C00-14)	236(100)	60(100)	71(100)	105(100)
Including: Lips (C00)	11(4,7±0,41)	3(5,0±1,41)	5(7,1±1,53)	3(2,9±0,99)
Tongue and oral mucosa (C01-09)	171(72,5±1,45)	42(70,0±2,96)	52(73,2±2,65)	77(73,3±2,64)
Pharynx (C10-14)	54(22,9±0,89)	15(25,0±2,80)	14(19,7±2,38)	25(23,8±2,54)

Table 2

Dynamics of sexual and age data of maxillary-facial MT of the Republic Sakha population in the period of 2000-2014 and its prognosis by 2020 (pop.100000)

Year	-30	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-	RF
M/F											
2000	0,4	0,0	1,2	3,3	7,4	12,4	21,3	41,2	24,0	40,0	5,9
2005	0,0	0,0	0,0	3,8	6,2	10,4	16,3	9,9	20,2	26,0	3,9
2010	0,7	0,0	0,0	1,6	10,5	9,6	17,4	18,0	30,3	31,8	5,5
2011	0,2	0,0	2,9	1,6	5,7	8,1	12,0	10,5	49,3	28,3	4,4
2012	0,0	0,0	0,0	3,2	4,5	14,7	25,1	29,6	16,6	20,6	5,4
2013	0,0	0,0	5,9	3,2	0,0	13,6	22,9	30,1	33,6	28,8	6,0
2014	0,0	0,0	0,0	1,6	1,6	4,2	20,9	21,9	53,4	77,3	8,0
2020			1,5	1,2	-1,1	6,1	16,5	14,2	16,7	27,6	5,4
Male											
2000	0,4	-	-	2,2	7,5	18,0	37,8	67,9	23,9	41,7	6,5
2005	-	-	-	7,8	12,9	19,2	20,3	23,1	50,6	49,4	6,5
2010	-	-	-	3,2	13,7	14,7	35,2	28,0	30,9	64,0	7,4
2011	0,4	-	3,0	-	11,8	8,5	23,0	18,5	94,2	47,0	6,4
2012	-	-	-	3,2	3,1	25,6	41,1	57,8	28,2	23,7	8,0
2013	-	-	3,0	6,5	13,1	31,8	43,6	49,0	73,0	64,6	11,4
2014	-	2,5	-	3,2	13,5	17,8	35,4	41,3	41,4	24,8	8,0
Female											
2020				3,2	0,9	13,1	31,9	33,1	26,8	36,7	8,0
2000	-	-	2,4	4,4	9,6	10,4	13,4	24,7	16,1	44,1	5,0
2005	-	-	-	-	-	2,8	12,9	-	-	14,5	1,4
2010	8,4	-	-	-	7,7	6,3	5,3	19,9	24,5	15,8	3,7
2011	-	-	3,1	2,8	-	6,2	4,6	10,1	8,3	19,2	2,4
2012	-	-	-	2,9	5,1	6,1	17,2	18,3	8,8	19,1	3,5
2013	-	-	3,1	3,0	-	11,9	16,1	31,7	29,7	27,1	4,9
2014	-	2,0	-	-	2,6	3,2	-	12,7	15,0	28,3	12,2
2020					0,5	5,5	11,8	20,6	14,0	20,1	6,3

Table 3

Dynamics of the Republic Sakha population morbidity with maxillary-facial MT in 1990-2014 and its characteristics by 2020. (popul.100000)

Observation years	MN of Maxillofacial area - total (ICD-10 C00-09,46,2, 10, 11, 12, 13)			Including:								
				Tongue (C00)			Tongue, salivary glands, oral mucosa(C0-09,46,2)			Fauces, nasopharynx, hypopharynx (C10, 11, 12, 13)		
	M/F	Male	Female	M/F	Male	Female	M/F	Male	Female	M/F	Male	Female
2000	1,7±0,42	2,4±0,71	1,0±0,45*	0,6±0,25	1,0±0,46	0,2±0,20	4,2±0,65	4,1±0,91	4,2±0,92	1,1±0,34	1,4±0,54	0,8±0,40
2001	1,6±0,41	2,9±0,77	0,4±0,28*	0,4±0,20	0,8±0,41	-	3,5±0,59	4,3±0,94	2,6±0,73	1,2±0,35	2,0±0,65	0,4±0,28*
2002	2,1±0,47	3,9±0,90	0,4±0,29*	0,5±0,23	1,0±0,46	-	2,4±0,50	3,3±0,82	1,6±0,57*	1,6±0,41	2,9±0,77	0,4±0,29*
2003	2,2±0,48	3,2±0,84	1,2±0,50	0,5±0,24	0,6±0,37	0,4±0,29	2,8±0,55	4,1±0,94	1,6±0,58*	1,7±0,42	2,6±0,75	0,8±0,41*
2004	3,1±0,57	5,2±1,06	1,0±0,46*	0,7±0,28	1,3±0,53	0,2±0,21	3,3±0,59	4,8±1,01	1,8±0,62*	2,3±0,49	3,9±0,92	0,8±0,41*
2005	2,2±0,48	3,9±0,92	0,6±0,35*	0,4±0,21	0,9±0,43	-	1,7±0,42	2,6±0,75	0,8±0,41	1,8±0,43	3,0±0,81	0,6±0,35*
2006	2,9±0,56	5,2±1,06	0,8±0,41*	0,7±0,28	1,1±0,48	0,4±0,29	3,8±0,63	5,6±1,11	2,0±0,65*	2,2±0,48	4,1±0,94	0,4±0,29
2007	2,5±0,52	4,1±0,95	1,0±0,46*	0,7±0,28	1,1±0,48	0,4±0,29	3,2±0,58	5,0±1,04	1,4±0,54*	1,8±0,43	3,0±0,81	0,6±0,35*
2008	2,9±0,56	5,0±1,04	1,0±0,46*	0,6±0,26	1,1±0,49	0,2±0,20	3,8±0,63	5,0±1,04	2,7±0,74	2,3±0,49	3,9±0,92	0,8±0,41*
2009	1,8±0,43	3,5±0,87	0,2±0,20*	0,5±0,24	1,1±0,49	-	3,5±0,60	5,4±1,09	1,6±0,58*	1,3±0,36	2,4±0,72	0,2±0,20*
2010	2,1±0,47	3,5±0,87	0,8±0,41*	0,3±0,18	0,7±0,38	-	3,4±0,60	3,9±0,92	2,9±0,76	1,8±0,43	2,8±0,79	0,8±0,41*
2011	1,6±0,40	2,3±0,71	0,8±0,41*	0,4±0,21	0,4±0,30	0,4±0,29	2,8±0,54	4,1±0,94	2,0±0,64*	1,1±0,35	1,9±0,64	0,4±0,29*
2012	1,8±0,44	3,3±0,84	3,4±0,83	0,2±0,15	0,4±0,30	2,6±0,72	3,5±0,60	4,4±0,96	2,6±0,72	1,6±0,41	2,9±0,78	0,8±0,40*
2013	2,2±0,48	2,8±0,78	1,6±0,58	0,2±0,15	0,2±0,22	0,2±0,20	3,8±0,63	4,1±0,94	3,5±0,84	2,0±0,46	2,6±0,75	1,4±0,54
2014	1,9±0,44	2,8±0,78	1,0±0,45*	-	-	-	4,0±0,64	5,2±1,06	2,8±0,76*	1,9±0,44	2,8±0,78	1,0±0,45*
2020	**1,6**	**2,9**	**0,9**	**0,1**	**0,1**	**0,5**	**3,8**	**5,1**	**2,8**	**1,5**	**2,7**	**0,4**

* Statistically significant comparing to male indexes (p<0,05)

Table 4

Annual morbidity with all the nosological forms of maxillary-facial malignant tumour in the regions of the Republic Sakha (Yakutia) in the period of 2001-2010

Ulus (Districts)	Male	Female	Ulus (Districts)	Male	Female
Abyisky	12,9	8,2	Neryungrinsky	5,3	1,7
Aldansky	13,8	4,5	Nizhnekolymsky	6,8	3,3
Allaikhovsky	0,0	0,0	Nyurbinsky	8,7	5,4
Amginsky	10,7	2,2	Oimyakonsky	6,5	3,0
Anabarsky	0,0	0,0	Olekminsky	6,5	3,6
Bulunsky	2,0	0,0	Oleneksky	14,6	4,9
Verkhnevilyusky	4,8	0,9	Srednekolymsky	9,8	7,0
Verkhnekolymsky	13,6	3,5	Suntarsky	2,4	3,1
Verkhoyansky	10,3	1,5	Tattinsky	2,4	4,8
Vilyusky	2,4	2,3	Tomponsky	9,2	7,8
Gornyi	7,2	5,1	Ust-Aldansky	3,7	1,7
Zhigansky	4,8	4,5	Ust-Maisky	8,3	0,0
Kobyasky	14,2	1,4	Ust-Yansky	13,4	0,0
Lensky	6,3	2,5	Khangalasky	7,1	3,6
Megino-Kangalasky	8,8	1,8	Churapchinsky	6,2	1,0
Mirninsky	9,3	1,2	Ev-Bytantaisky	7,8	0,0
Momsky	8,7	0,0	Yakutsky	11,8	3,2
Namsky	5,8	1,8	Republic of Sakha (Yakutia)	8,8	2,7

Table 5

Annual morbidity with maxillary –facial malignant tumour in the territory o the Republic Sakha (Yakutia) in the period of 2001-2010

Medical and geographical areas of Republic of Sakha (Yakutia)	MN of Maxillofacial area - total (C00-09,46,2, 10, 11, 12, 13)			Including:					
				Tongue, salivary glands, oral mucosa (C0-09,46,2)			Fauces, nasopharynx, hypopharynx (C10, 11, 12, 13)		
	Total Population	Male	Female	Total Population	Male	Female	Total Population	Male	Female
Polar	5,04	7,84	2,22	2,46	3,43	1,48	2,33	3,92	0,74
Eastern	6,75	8,87	4,49	4,10	4,67	3,49	1,20	2,33	-
Western	3,55	4,37	2,77	2,13	2,29	1,98	1,32	1,87	0,79
Central	3,89	5,33	2,49	*2,21*	2,77	1,66	1,42	2,24	0,62
Southern	7,25	11,30	3,29	2,42	3,66	1,20	3,32	4,88	1,79
Bigger cities	6,22	10,10	2,62	3,82	5,68	2,09	1,78	3,26	0,41
Republic of Sakha (Yakutia)	5,47	8,36	2,70	3,12	4,35	1,94	1,79	3,04	0,60

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THE METHODS TO IMPROVE SECURITY ENDOSCOPIC TRANSPAPILLARY SURGERI IN CHOLEDOCHOLITHIASIS

ABSTRACT

The article highlights the issues of improving the safety of endoscopic transpapillary interventions at choledocholithiasis to reduce the risk of its serious complications - bleeding and perforation of the duodenum wall, expanding indications for emergency and routine endoscopic retrograde cholangio - pancreatography with endoscopic papillosphincterotomy and mechanical stone extraction in patients with a high degree of operational risk (comorbid diseases, elderly and senile age).

Keywords: safety increase, endoscopic papillosphincterotomy, reduction of complications, expansion of indications of emergency endoscopic retrograde cholangio - pancreatography, a high degree of operational risk.

INTRODUCTION

Quality of rendering the emergency medical care in no small measure depends on activity of auxiliary profile surgical endoscopic office. During the round-the-clock watch the endoscopist works as a part of surgical crew. Development by all doctors of endoscopic office of operational types of research for rather short time promotes uninterrupted rendering the emergency medical care by high-tech low-invasive methods. When performing diagnostic endoscopic testing direct transition to medical and expeditious manipulations is possible, that allows executing not only palliative, but also radical treatment of an acute surgical disease at a diagnostic stage of rendering medical help. In the conditions of North sharp surgical diseases have the specifics, the extreme influences of environment caused by a complex. Remoteness of settlements and dependents of transport connections on climatic conditions quite often promote to the late address of patients with an acute surgical diseases behind medical care that can lead to development of complications. This category of patients comes to hospital with an average and a serious general condition, with violations of functions of various systems of an organism (violation of duration and coagulability of blood, etc.). Urgent and safe performance of the emergency endoscopic research, with elimination of the complications menacing to life of the patient elimination of the block bile-excreting ways and restoration of a passage of bile,etc.). Helps to win time for training of the patient for a band surgery. Promotes decrease in a lethality of heavy category of patients. The most terrible complication of cholelithiasis (cholelithiasis) is the mechanical jaundice (obstructive jaundice), cholelithiasis is the most frequent reason of development of and makes, according to various authors of 37-66%. The sparring low - invasive method allowing to eliminate the reason of mechanical jaundice and to restore ways for bile outflow is the complex endoscopic retrograde cholangiopancreatography (ERChPG) with performance of an endoscopic papillosphincterotomy (EPST) and the mechanical extraction of concrements (MEC). The emergency researches are quite often carried out difficult conditions (the general serious condition of the patient, violation of functions of an organism, after hours, without assistants in a short space of time).

MATERIAL AND METHODS

The electrosurgical UES block-10, phibroduodenoscope and tools to them (a catheter, string and needle papillotomy, a basket of Dormia) "Olympus" firms were used. Intracavitary expeditious endoscopy, in particular EPST (a cut of BDS and a longitudinal fold) is carried out of by influence of the current of high frequency (CHF) at various parameters of the mode in power. CHF (current high a frequency up to 1 million cycles per second), passing through fabrics, leads to heating of intracellular liquid to high temperatures and destruction of cages the formed steam. CHF can be cutting, coagulating and mixed depending on the size of electrotodes and current. These parameters the endoscopist (selection of the mode and power of current) establishes. Inclusion of the mode "cutting" or "coagulation"

is carried out by pressing the corresponding foot pedals. At the "mixed" mode pressing a pedal "cutting" joins at the same time both cutting and coagulation. Power of CHF varies from 1 to 5 watts and above. For decrease in risk of developing of bleeding and perforation of a wall of a duodenum we picked up the optimum mode and power of cutting (OMPC) by the current of high frequency (CHF): the mode - "mixed" the power - 3,5 of watts. For increase of tightness of a phibroendoscope between the case and a cap of the bioptic valve the rubber strip is inserted (it is cut out from a disposable glove).

RESULTS AND DISCUSSIONS

We carried out the retrospective analysis from 2010 to 2014, executed 504 ERPChG, including with endoscopic papillosphincterotomy (EPST) and the mechanical extraction of concrements (MEC). Statistical data in separate years have certain errors due to need of repair of the endoscope and acquisition of tools to them therefore for composition average values in 5 years are taken. According to the table n.1 from 2010 and for 2014 one-stage performance of complex ERPChG increased on average from 20% to 35%. Performance of ERPChG (including medical quick ERPChG) according to the emergency indications increased on average from 20% to 50%. The emergency operational ERPChG is executed in 18 cases at indications of duration and coagulability of blood from 6 min. to 8 min. Short-term insignificant capillary bleeding was noted in 11 cases from total of EPST (256) that made 4,2% which was stopped by an irrigation of river of AKK of 5%, research in all cases executed full. The venous bruise was noted in 3 cases (1,2%) which was stopped by electrocoagulation (ranging from 2,24 and to 5,3% of cases). After endoscopic hemostasis of a venous bruise in 2 cases reseated is executed in full, in the 1st case research time is transferred. It wasn't noted retrograde perforation of a wall a duodenum. In 2010 by results of ERPChG concrements in 28 cases (the sizes from 0,3 cm are revealed in the general bilious channel and to 2 cm), from them in 5 cases large concrements by the sizes from 1 cm and to 1,5 cm are taken. In 2 cases because of the bug size concrements aren't taken. From total of ERPChG (77) it is executed an endoscopic retrograde cholangiography (ERChG) in 36 cases (48%). Attempt of ERPChG - 3. Endoscopic retrograde pancreatography (ERPG) - 2. In 2011 by results of ERPChG concrements in 55 cases are revealed in the general bilious channel, from them in 10 cases large concrements from 1 cm and to 1,5 cm are taken. In three cases because of the big size concrements aren't taken. From total of ERPChG (110) it is executed an endoscopic retrograde cholangiography (ERChG) in 27 cases (26%). Attempt of ERPChG - 7. An endoscopic retrograde pancreatography (ERPG) - 8.

In 2012 by results of ERPChG concrements in 40 cases are revealed in the general bilious channel, from them in 6 cases large concrements from 1 cm and to 1,5 cm are taken. In 2 d cases of the big size concrements aren't taken. From total of ERPChG (102) it is executed an endoscopic retrograde cholangiography (ERChG) in 20 cases (20%). Attempt of ERPChG - 2. Endoscopic retrograde pancreatography (ERPG) - 12. In 2013 to year by results of ERPChG concrements in 43 cases are revealed in the general bilious channel, from them in 4 cases large concrements from 1 cm and to 1,5 cm are taken. From total of ERPChG (83) it is executed an endoscopic retrograde cholangiography (ERChG) in 17 cases (21%). Attempt of ERPChG - 3. Endoscopic retrograde pancreatography - 2. In 2014 ERPChG showed that there were concretions in 85 cases, from there in 7 cases there were big concretions from 1 sm to 1,5 sm. In 3 cases concretions were not recovered because of big size.

Comparative table №1

Type of research	Type of address	ERPChG	ERPChG and EPST	ERPChG and EPST и MEC	In total
ERPChG 2010	plans	37 (48%)	12 (16%)	16 (21%)	65 (84%)
	urgent	7 (9%)	1 (1,3%)	4 (5%)	12 (16%)
	in total	**44** (57%)	**13** (17%)	**20** (26%)	**77 research**
ERPChG 2011	plans	40 (36%)	5 (4,6%)	32 (29%)	77 (70%)
	urgent	26 (24%)	2 (1,9%)	5 (4,5%)	33 (30%)
	in total	**66** (60%)	**7**(6,5%)	**37** (33,5%)	**110 research**
ERPChG 2012	plans	28 (27%)	6 (6%)	6 (6%)	40 (39%)
	urgent	37 (36%)	11 (11%)	14 (14%)	62 (61%)
	in total	**65** (63%)	**17** (17%)	**20** (20%)	**102 research**
ERPChG 2013	plans	21 (25%)	4 (5%)	10 (12%)	35 (42%)
	urgent	22 (27%)	6 (7%)	20 (24%)	48 (58%)
	in total	**43** (52%)	**10** (12%)	**30**(36%)	**83 research**
ERPChG 2014	plans	20 (15%)	22 (17%)	32 (24%)	74 (56%)
	urgent	22 (17%)	15 (11%)	21 (16%)	58 (44%)
	in total	42 (32%)	**37** (28%)	**53** (40%)	**132 research**

According to table n.2 it is visible that the number of patients with cholethiasis, number of women is about 23% more, than at men. Patients aged from 60 and till 80 years make 49%.

Comparative table №2

Years	Floor	20-29	30-39	40-49	50-59 лет	60-69	70-79	80-89	90 <	
2010	Man	-	-	-	4	11	9	3	-	27 (35%)
	Women	-	5	1	10	14	6	14	-	50 (65%)
	In total	**-**	**5**	**1**	**14**	**25**	**15**	**17**	**-**	**77**
2011	Man	1	3	1	12	20	11	-	-	48 (44%)
	Women	2	5	14	12	5	17	7	-	62 (56%)
	In total	**3**	**8**	**15**	**24**	**25**	**28**	**7**	**-**	**110**
2012	Man	-	1	10	9	12	3	8	-	43 (42%)
	Women	6	5	6	12	19	7	4	-	59 (58%)
	In total	**6**	**6**	**16**	**21**	**31**	**10**	**12**	**-**	**102**
2013	Man	1	5	5	5	8	6	1	-	32 (39%)
	Women	4	1	6	8	17	12	3	-	51 (61%)
	In total	**5**	**6**	**11**	**13**	**25**	**18**	**4**	**-**	**83**
2014	Man	-	4	5	8	16	15	5	-	53 (40%)
	Women	4	9	6	16	18	18	8	-	79 (60%)
	In total	**4**	**13**	**11**	**24**	**34**	**33**	**13**	**-**	**132**

CONCLUSIONS

Thus, increase of safety of EPST it was succeeded to achieve improvement of quality of EMP for the account: 1) minimizing of heavy complications; 2) extensions of indications and increase in quantity of the emergency complex ERPChG (ERPChG with the EPST or EPST and MEK) to patients with high degree of operational risk / from 20% to 35%; 3) increases in number of performance of the emergency one-stage complex ERPHG from 20% to 50%; 4) creations of optimum conditions for planned expeditious treatment; 5) decrease in term of recovery of patients; 6) decrease in activity; 7) decrease in beam load of the Doctor and patient; 8) development of a method of complex ERPChG, all doctors of office, for rather short time; 9) increases of efficiency of use of the available endoscopic equipment; 10) tightness increases, terms of service of the bioptic valve of phibroendoscope and respectively to cut financial expenses.

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MEDICAL AND ECONOMIC BENEFITS OF AUTOMATED COMPLEX ACPEP-ACPME

ABSTRACT

The paper presents an assessment of the economic and medical efficiency of the automated complex for prophylactic medical examination ACPEP-ACPME (automated complex of preventive examination of population and automated complex for prophylactic medical examination) for dispensary / preventive examination of children in the areas of the Republic of Sakha (Yakutia)

Technology ACPEP-ACPME needed for preconditioning the list of children in need for advice by specialists. This is especially true in the country districts , where narrow specialists come brigade on a small amount of days.

Keywords: children, automated systems, medical examination.

INTRODUCTION

The organization of public health care in remote inaccessible areas of the Far North has always been one of the most difficult tasks of Health. The complexity of the problem largely involves the specifics of livelihood systems and low-power of the health infrastructure in the conditions of extreme climate.

Personnel shortage of pediatric doctors in rural and remote northern settlements imposes a very peculiar mark on the organization of medical care for children's population. [1-5]

We present an assessment of the economic and medical efficiency of the automated complex ACPEP-ACPME for advanced preventive medical examinations of children in the areas of the Republic of Sakha (Yakutia)

Since 1993, Russia is the introduction of automated systems of dispensary examinations ACPEP-ACPME (automated complex of preventive examination of population and automated complex for prophylactic medical examination) children and adolescents and adults since 2005 - ACPME

Medical effectiveness complex ACPME confirmed state tests and many years of work, is over 80%. Experience ACPME use in practical public health shows that their application enables[4,5].

• Increasing the efficiency of medical examinations by 3-4 times.

• Reducing the economic costs of inspections (4-5 times).

• Exemption of medical specialists from routine inspections brigade, ie reduction of personnel shortage.

• Operative reception of objective health monitoring data of the population with the ability to analyze and forecast.

• The evolutionary transition to a "paperless" technology.

• Rigid standardization dispensary inspection procedures and evaluation of the results and, as a consequence, a sharp decrease in subjective factors.

The consistent reduction within 5 years of planned hospitalization by 18-20%, disability children up to 15% due to the early detection of chronic diseases and timely treatment and rehabilitation work [4,5].

Purpose: Assess the economic and medical efficiency of ACPME in the areas of the Republic of Sakha (Yakutia) .

MATERIALS AND METHODS

The calculation of the economic and medical efficiency of ACPME using previously obtained data A.TS. Lyaskovika [5] .

RESULTS

As part of the "health care modernization" program, this technology - automated complex dispensary inspection - ACPME was delivered in 10 Arctic areas: the Anabar, Abyisky, Oleneksky, Bulun, Ust-Jansky, Allaikhovskiy, Lower Kolyma, Mid-Kolyma, Zhigansky, Kobyayskiy areas.

To calculate the cost-effectiveness of the method used ACPME A.TS. Lyaskovika (Table 1-2). The cost of examination of the child by a brigadier of 867.6 rubles. And the cost of the inspection apparatus AKDO child is 135.6 rubles.

Table1

Calculating the cost of examination of the child by Brigadier

Number of medical specialists	N = 8-9 people
Number of middle medical personnel	N1=1
The capacity of medical specialists	B = 4000 person / year
The cost of laboratory tests (2015).	Blood-400rub., Urine -250 rubles. Total K = 650rub.
The average doctor's salary for the year	Dı=42000·12=504000 rub.
The average nurse's salary for the year	Dı=24,102·12=289,224
Medical effectiveness "Brigadier inspection" (according to the National Research Institute of Public Health of the RAMS)	F=11%
The cost per child	Сіреб.=N·(D+Dı):(B+K) 8·(504000+298,224):(4000+650)=867,6 rub.

Table 2

Calculating the cost of a child by a examination apparatus ACPME

System Cost	A=250000 rubles
System capacity	B=4000 person / year
Tact inspection system	C=10 минут
The number of medical staff	1 pediatrician, 1 nurse
The average salary for the year physician	D=42000·12=504000
The average salary for the year nurse	Dı=24,102·12=289,224
Medical efficiency of the system (according to the state tests)	F≥90%
Statutory annual rate of recoupment of capital expenditures	E=0,15
The cost of laboratory tests	Blood-400 rub., the urine-250rub., a total of K = 650 rubles.
The approximate cost of system maintenance analysis	N=10% год
Approximate cost of utilities (heat and light)	ACPME=64000 руб.в год
The cost per child	Сіchild.=(A·E+A·N+D+Dı+L):(B+K)= (250000·0,15+250000·0,1+504000 +289,224+64000):(4000+650) =135,6 rub.

Comparison of the effectiveness of examination of the child by a brigadier and ACPME shown in Table 3

Table 3

Comparative data of medical examination of the child by a brigadier and the use of technology ACPME

Indicators	Brigadier method	ACPME
Medical efficiency,%	7-11% (according to the National Research Institute of Public Health of the RAMS)	More than 80% (according to the manual, and reviews of health facilities)
Capacity, pers. / Year	4000	4000 and more
Approximate cost of inspection, rub	1157,78rub (According to the Health Committee of Republic of Sakha (Yakutia)	135,6 rubles
The economic effect	On children at 4000 the total amount is 3,470,400 rubles	In 4000 the total amount of children will 542400. Savings 2928000

So, the average cost of such a medical procedure using the medical examination ACPME 6.4 times below, the medical effectiveness of over 80% than brigade method.

During the implementation of this technology in the field revealed that, as in the Arctic regions actually work 1 or 2 pediatrician physically do the work for the implementation of this technology has been very problematic. Since the examination of the child at 1 ACPME unit it takes 20-25 minutes on average. Therefore, in our opinion, it is advisable to use this technology in the regional centers, trained in the use of the nursing staff of technology.

CONCLUSIONS

The use of automated systems of preventive medical examinations of children provides a direct economic and medical impact. An examination of one child is about 6.4 times cheaper, and the medical efficacy of more than 80% according to the operation of health care facilities, and reviews.

On average, the price of such medical procedures as a physical examination by a ACPME 6-7 times lower and medical efficiency is more than 80% than the brigade method.

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CLINICAL CHARACTERISTIC OF STRUCTURE AND PROPERTIES OF SOLID TISSUES OF INTACT TEETH AMONG CHILDREN OF SCHOOL AGE LIVING IN THE CONDITIONS OF THE NORTH

ABSTRACT

Complex laboratory research of solid tissues condition of the intact teeth extracted according to orthodontic indications among school age children living in conditions of the North-East of Russia has been carried out. Specific regional risk factors of the development of dental diseases are necessary to take into account for improvement of the treatment-and-prophylactic help to the population. So, researchers have established certain changes of structure and properties of solid tissues of teeth which are connected with disorders of structural uniformity and calcium - phosphorus coefficient. At the same time the received results of weight ratio of calcium and phosphorus characterized decrease of enamel resistance of intact teeth among children of school age. It is connected with the fact that there is a replacement of calcium and phosphorus with others macro - and microelements in the crystal lattice of hydroxyapatite which cause susceptibility of teeth enamel to the influence of the cariogenic factors of external and internal environment. At that time the indicator of tissues mass from oral surfaces of intact premolars and molars was on the sites with low level with the reliable importance that is connected with anatomy-topographical features of molars and premolars as vestibular hillocks were more expressed.

The revealed quantitative and qualitative changes of enamel and dentine of second teeth create prerequisites for development of pathological processes of solid tissues of demineralizing character that respectively can be considered as specific regional risk factor. In this regard it is necessary to consider the revealed and established risk factors organizing events, directed to the improvement of dental help to the population. These facts dictate need of the comprehensive program development of the teeth caries prevention among children of preschool and school age in the region directed to increase of resistance of teeth solid tissues with use of calcium, phosphorus and fluorine.

On the other hand, the obtained data define need of carrying out further complex researches directed to detection of regional risk factors of the development of pathological processes of organs and tissues of oral cavity.

Keywords. Caries of teeth, microhardness of teeth, structural uniformity, hydrostatic weight, resistance of solid tissues of teeth.

INTRODUCTION

Nowadays pathogenetic mechanisms of pathological processes of teeth solid tissues of demineralizing character are widely studied that it is connected with the high level of their prevalence among various age groups of the population [1, 6, 7, 8, 10, 11, 13, 14, 15, 16]. Despite it, problems of treatment and prevention of teeth caries are not solved yet [3, 4, 5, 12]. Caries of teeth and its complication in oral cavity often form the chronic odontogenic infection center which can lead to the development of focal caused diseases (diseases of kidneys, liver, joints, etc.) [2, 9]. In this regard the researches directed to the solution of treatment and prevention of teeth caries are actual.

Natural and climatic conditions of Yakutia are characterized as severe that leaves a negative print on a functional condition of organs and tissues of oral cavity including teeth solid tissues that demands carrying out the researches directed to studying of structural uniformity of solid tissues, and also their quantitative changes.

Research aim. To determine teeth functional state level on the basis of complex research of quantitative and qualitative changes of teeth solid tissues.

Materials and methods of research. Research of solid tissues of the intact teeth extracted according to orthodontic indications was conducted. In total 88 stones of incisors, canines, premolars and molars have been examined. Research of contact and lateral surfaces, vestibular and oral sides, apex of cheek, oral tubercles, fissures of chewing surfaces, contact front and back surfaces, cheek and oral sides of premolars and molars was done.

Studying of microhardness of teeth solid tissues was carried out by Vickers's method, regulated by GOST 2999-75. Hardness was measured at loadings from 9,8 N (1 kgf) to 980 N (100 kgf) in the device "DIGITAL MIKROINDENTATION TESTER LM-700" (Japan). The metod was based on diamond tip caving-in in the form of the regular tetrahedral pyramid in the sample under the influence of the loading P enclosed during certain time and measurement of a diagonal print of d1 and d2, which have remained on the sample surface after loading removal. Vickers's method is considered to be the most perfect, it allows to measure the hardness of both soft and solid materials. The measurement was carried out according to the scheme shown in Figure 1, at each point was carried out at least 3 measurements, then calculate the everage.

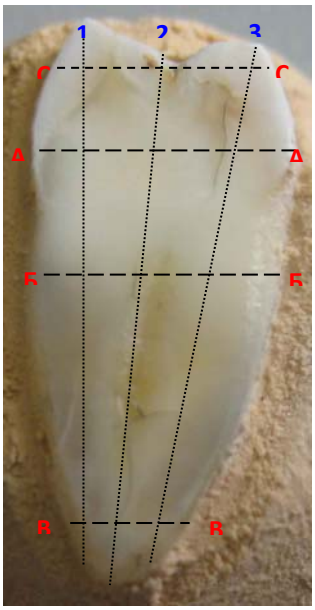

Figure 1. Microhardness measurement diagram of the section of the tooth on the Vickers hardness test.

Research was conducted at the department of solid state physics and technology institute "North-eastern federal university named after M. K.Ammosov".

Determination of density of solid tissues of intact teeth was carried out by measurement of the linear sizes of samples and method of hydrostatic weighing with measuring scales.

Studying of structural uniformity of inside layers of enamel and teeth dentine was carried out with application of method of x-ray power-dispersive microanalysis with standardless analysis detector by means of the combined device XL 20 (Philips), raster electronic microscope, radiological microanalyzer with dispersion on energy (Scott V.D., Love G., 1983). Microphotos were received in the mode of secondary electrons, quantitative analysis was carried out by standardless method promoting obtaining considerably bigger volume of reliable experimental data. Also the radiological power-dispersive spectral microanalysis of inorganic elements (sodium, magnesium, aluminum, silicon, inorganic phosphorus, sulfur, chlorine, potassium, calcium) of enamel and dentine was carried out.

Statistical processing of clinical material was carried out with application of standard methods of variation statistics. The received results have been grouped in a set of identical signs. A critical significance value when checking statistical hypotheses was $p \leq 0,05$.

RESULTS AND DISCUSSIONS

The analysis of the obtained data of the spectral microanalysis characterizing the saturation of teeth solid tissues of micro-microelements confirm some of their features of their weight ratio and ratio of atomic mass. In structure of weight ratio indicators, the important place is taken by calcium and phosphorus which indicators fluctuated within 40,42-41,42 and 18,22-18,64%. At the same time these concentration of fluorine and sodium were in limits of digital values 0,99-1,82 and 0,86-2,31%. Dta of such components as chlorine and magnesium were characterized as insignificant levels of concentration and they respectively made 0,48-1,02 and 0,32-0,42%. Meanwhile, the received results of weight ratio of calcium and phosphorus characterize disorders of enamel structural uniformity of intact teeth among children of school age that was confirmed by indicator of calcium - phosphorus molar coefficient made 1,93 (optimum value 1,67). It was connected with the fact that there is a replacement of calcium and phosphorus with others macro –microelements in a crystal lattice of hydroxyapatite which cause decrease in resistance of teeth enamel to influence of cariogenic factors of external and internal environment.

It is necessary to emphasize that ratios of atomic mass of fluorine and chlorine in enamel fluctuated within 2,93-3,25 and 0,57-1,96%. At the same time average indicators of a share of atomic mass of calcium and phosphorus made considerable part and was 95,48% where the specific weight of calcium was 54,61% and the second component was 40,87%. The atomic mass of sodium and magnesium are at the level of digital values 1,40 and 0,71 % in intact teeth enamel among children of school age living in sharply continental climate of the North.

The above analysis showed that disorders of structural ratio of calcium and phosphorus concentration in indicators of the radiological spectral microanalysis of intact enamel of second teeth among children and teenagers removed according to orthodontic indications which promoted decrease in resistance of teeth solid tissues to aggressive influence of factors of external and internal environment were revealed. These facts of cariogenic situation create prerequisites to formation and development of pathological processes of teeth solid tissues of demineralizing character in children of school age of the Republic of Sakha (Yakutia) and respectively they are one of specific regional biological risk factors of development of teeth caries among indigenous population.

Knowledge of features of structural uniformity and composition of solid tissues is an important point for dentists for the rational organization of the teeth caries treatment-and-prophylactic help. In this regard we have carried out an assessment of properties and some features of composition of solid tissues of intact teeth among children of school age living in the Central Yakutia.

The carried-out analysis of these measurements of teeth tissues hardness by Vickers's method characterized existence of variations of numerical values (tab. 1). In such sites as, enamel of chewing surfaces of molars and premolars, tooth hardness reached maximum level and respectively it ranged from 964,3 to 1952,7 N (kgf), at the same time indicators of enamel surface in neck area were 305,1 and 548,2 N (kgf). Data of dentine root hardness in the area ½ and near apex fluctuated ranged from 294,7 to 467,8 N (kgf) and from 217,1 to 404,9 N (kgf).

Table 1

Characteristic of microhardness of solid tissues of intact teeth among children of school age

Measurement point	Measurement of tooth hardness by Vickers's method (kgf)			Mean value by measurement points
	Vestibular surface	Central surface	Oral surface	
А	411,91±4,17	381,4± 5,14	422,01±4,84	405,10±0,88
Б	352,55±3,75	391,2±3,30	385,38±3,78	376,37±0,83
В	206,43±4,03	314,8±4,11	311,71±4,076	277,61±2,35
С	1359,5±16,61	1315,03±20,71	1129,8± 16,18	1268,11±4,97

Researches by method of hydrostatic weighing measurement of solid tissues of intact teeth have given data of their mass and density which had some features. So, the indicator of tissues mass from oral surfaces of intact premolars and molars was in sites below digital values from the vestibular side in 0,18 m/g, with the reliable importance (P<0,05).

It, most likely, is connected with anatomy-topographical features of molars and premolars as vestibular tubercles were more expressed. The assessment of these linear measurements hasn't revealed existence of features. So, indicators of density of the studied sites from oral and vestibular surfaces varied from 1,79 to 2,25 g/cm ³. At the same time average indicators had no special distinctions.

Conclusion. The conducted research characterized certain quantitative and qualitative changes of solid tissues of intact teeth among children of school age who were connected with disorders of their structural uniformity due to expense of calcium - phosphorus coefficient imbalance. These facts reduced resistance of teeth solid tissues to aggressive factors of external, internal environment and cariogenic situation promoted the development of pathological processes of demineralizing character. The revealed risk factors need to be considered when carrying out treatment-and-prophylactic actions in the conditions of the North.

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QUESTIONING OF PATIENTS WITHIN AN INDEPENDENT ASSESSMENT OF THE QUALITY OF MEDICAL SERVICES

ABSTRACT

With the aim to identify the interactive questionnaire advantages and disadvantages a comparative analysis of this questionnaires developed by the specialists of the Ministry of Health of the Russian Federation (the Order the Russian Ministry of Health from May 14, 2015 № 240) and standard questionnaires used in the paper was held, as well as the survey of 122 potential patients for their opinion of the interactive questionnaire on official websites of the Ministry of Health institutions of the Khabarovskiy krai.

Results and discussion. Low initiative of patients on the Internet has been revealed (for half of a year the total number of respondents to the outpatient questionnaire was no more than 800 people, the hospital questionnaire was no more than 2350 people from 92 institutes). A formed sample is too small to assess the performance of institutions separately. Interactive questionnaires are still difficult to fill in for patients due to the inertia of the older generation, as well as the indifference and lack of initiative of young people. Up to 2/3 of respondents required further explanation on the questionnaire, which increases the number of unanswered questions and, in the case of the interactive version, it does not allow to register the respondent's profile on the site. Presented unambiguous answers to the questionnaire ("yes" or "no") lose 5 ones proposed in the recommendations № 118 of the year 2009 of Compulsory health insurance fund.

Conclusion. Low population initiative limits the widespread use of interactive questionnaires for public consultation. Absence of open issues restricts the ability of patients to express their own opinion. Imprecise wording of "service satisfaction" and "specialists' competence" in the proposed issues lead to the needs of clarifying information and increase the number of incorrect answers among the respondents. Unfortunately, the answers to most questions ("yes" or "no") lose in accuracy during calculation the satisfaction rate. In order to increase the number of answered questions during the survey a supervisor/consultant should be present.

Keywords: interactive questionnaire, independent assessment of the quality of organizations' service, sociological research, the accessibility and quality of medical care.

INTRODUCTION

Modern World Health Organization strategy puts increasingly the interests of the citizen in the framework of the institution and industry, as well as state policy of health care provision. Under the new business conditions, monitoring of medical care through the study of health care customer satisfaction took firmly its place among the other social marketing methods [1,2,3]. It is necessary to share the sociological studies of public opinion (with regard to the social composition of the population) and a marketing study of consumer demand in terms of their satisfaction with specific institutions or specific types of care [4]. When sociological research in medicine are conducting, in particular, questions of competence of patients in the evaluation of various aspects of the institutions and the leveling effect of the set of exogenous, psychological and other factors on the formation of public perceptions raise [4].

Based on the requirements of the Federal Law № 323-FZ "On the basis of public health protection in the Russian Federation", an action plan for the formation of an independent assessment of the quality of organizations providing social services for 2013-2015 was defined and approved by the Order of Government of the Russian Federation on March 30, 2013 N 487-p through a specially designed questionnaire, posted and available to patients on the websites of the Ministry of Health of the Russian Federation, authorities of subjects of the Russian Federation in the field of health, local government and health care organizations [5-10].

According to the standard method (paper variants, an oral explanation of the issues etc.), a public opinion poll of 558 patients was conducted. In accordance with the official guidelines and legal documents, it included blocks of questions related to access to medical care for the population and the quality of services by a 5-point scale. We proposed the "open" and "closed" form of questions [12]. We held a comparative analysis of the questionnaires of this study, and the on-line questionnaires, developed by experts of the Ministry of Health of the Russian Federation. These questionnaires both assessed the quality of medical organizations service in the region, *involved in the program of state guarantees of free medical care to citizens* [11]. The results of the on-line questionnaires on the sites of the Ministry of Health of Khabarovskiy Krai institutions were analyzed. We asked 122 potential patients to respond to "the questionnaire for assessing the quality of services the medical organizations in outpatient and inpatient settings" on the website, after that we purpose them to deliver on these on-line questionnaires [10]. The study involved 122 respondents aged 20 to 82 years. According to social status, 33.6% were retired, 55.7% employed, 4.1% students and 6.6% of non-working citizens. The women were 67.2%, the men were 32.8%.

RESULTS

Only 12.3% of respondents had information about the existence of on-line questionnaires, 9.0% were medical personnel, even 3.3% were related to the medicine. 73.8% of the respondents found not immediately the questionnaire on the websites on the Internet, 11.4% of them found quite quickly and 14.8% were undecided. 67.2% of respondents needed additional explanatory information in the process of completing the questionnaire. Only 4.1% of respondents agreed to search the questionnaire on the Internet on their own initiative, 87.7% refused and another 8.2% found it difficult to response. 72.1% of respondents chose paper version proposed by a health worker as the most suitable, 8.2% preferred the electronic version proposed by the health worker, and only 5.6% preferred an on-line version. Another 13.9% of the respondents found it difficult to answer this question.

Among the main difficulties in completing the questionnaire respondents indicated the following: - almost 90% of the respondents (87.7%) do not know about the existence of such surveys. Another 12.3% of respondents who were already familiar with the questionnaires at the time of the survey turned out mostly health workers. Among these 12.3% neither replied to the questionnaire previously (before the present proposal to participate in the survey); - only 30.3% of respondents, who were looking for the on-line questionnaire, founded immediately its location; - almost 70% (69.7%) required additional explanatory information in the process of completing the questionnaire; - 22.1% have not finished answering the survey questions, got out of the program and actually did not participate in the survey. Most of the respondents full in the paper version of the questionnaire; - 95.1% of respondents would not have to look for it on the Internet and to respond to the questionnaire on their own initiative.

DISCUSSION

The importance of the use of opinion poll for an independent assessment of the quality of medical services is difficult to overestimate. The amount of subjective evaluations obtained with a properly structured representative samples opens the hidden opportunities for improvement of the activity of institutions, taking into account the real needs of patients, being one of the health care quality management process mechanisms [4,11]. Thus, the choice of venue for the survey and study the composition of representative groups are of paramount importance in the organization of research.

Low initiative for interactive profiles of patients is indicative. So, given the fact that the questionnaires are available on the official websites of the Ministry of Health of the Khabarovsk Territory and medical institutions from September 2015 the total number of responses to the outpatient questionnaire to the end of May 2016 were no more than 800 people, to the hospital questionnaire were no more than 2350 people. In addition, most people willing to participate in the survey are patients with negative attitude.

According to the Order of the Russian Ministry of Health on December 30, 2014 № 956n, the opportunity to use the paper version of the questionnaire when they request it should be provided for patients [7]. Unfortunately, we do not have information about applying for obtaining and completing the paper version of the questionnaire, but on the basis of population activity on the Internet, we can assume that their number is negligible.

On-line forms of questionnaire are still a challenge for patients due to the inertia of the older generation, as well as the indifference and lack of initiative of young people. In addition, the lack of clarification on unclear questions (it took for 2/3 of respondents) increases the number of unanswered questions that, in the case of the online version does not allow registering the respondent's answers on the site. It is worth to remember possible glitches in the system with partial or complete loss of electronic information.

We would also like to have greater clarity on a number of issues proposed in the online questionnaire.

For example, in an on-line questionnaire divided the concept of "competence" (i. e. professionalism) and "satisfaction with service." The term "service satisfaction," the authors of the questionnaire have a view of the kindness and politeness towards patients by the staff, which is a component of public satisfaction with the medical services. In addition, some authors even combine these terms and include the "responsiveness", a conscientious attitude of physicians to perform their duties, as well as careful attention to patients to the criterion of "professionalism" [12].

Terms of service waiting (e. g. outpatient receive, diagnostic studies, as well as the planned hospitalization) at the moment of the appointment card receiving are prescribed in accordance with the territorial program of state guarantees of free medical care to citizens for the respective year. However, a bigger problem for the patients in this context becomes the receiving of this appointment card. In this case the terms are not limited to the program.

It should also be noted that the private clinics, as well as a number of departmental institutions, working with the compulsory health insurance (CHI) program, are not covered by this questionnaire.

During a comparative analysis of the traditional and on-line forms of questionnaires for compliance with the rules of creation and formulation of public opinion polls, established under the Order of the Federal Fund for CMI from 29.05.2009 № 118, the following recommendations attract the attention: "The survey (questionnaire) may be carried out in the form of a questionnaire using "open questions", defined by the initiators of their conduction, and contains the responses in a free form. The interviewers record the respondents' answers to «open questions» the words of the respondents legibly and maximize "(with translation later into formalized responses) [11]. In this case, only «closed questions» are used in the on-line questionnaire, «open questions» are not presented, which limits patients to express their own opinion. There is no possibility of oral consultations on unclear issues.

The samples are too few to assess the performance of individual institutions for a marketing study of consumer demand (initiative of citizens is very low), and the average value of all the institutions are at risk of being incorrect (there are different number of respondents on the websites of various institutions). For a sociological study such approach is not suitable in principle due to the lack of information about the social composition of the respondents.

One of the points of the Order of the Ministry of Health of the Russian Federation on December 30, 2014 № 956n reads: "It is possible to express the views of recipients of medical services on the quality of services of medical institutions on the official sites" [7]. Unfortunately, only two varieties of the responses ("yes" or "no") lose five ones proposed in the recommendations of the Federal Fund of CHI in 2009. These survey form in the same recommendations is characterized as "survey (questionnaire) under the simplified scheme" [11].

It is desirable to conduct calculations of the average value in all cases of questionnaires taking into account responses with varying degrees of satisfaction and of undecided, which is inevitable when working with real patients [11].

CONCLUSION

Low population initiative limits the widespread using of on-line questioning as a form of social control. Unfortunately, only two varieties of answers ("yes" and "no") lose to responses with varying degrees of satisfaction in both the perception by patients and the valuation of the average level of satisfaction with medical care. The proposed

imprecise statements of "service satisfaction" and "experts' competence" lead the need for explanatory information, which ultimately reduces the number of completed questionnaires and increases the number of incorrect responds.

The use of on-line questionnaires only "closed questions" limits recommended by the Order of the Russian Ministry of Health on December 30, 2014 № 956n "the possibility of expression of the recipients' meaning about the health service quality in medical organizations" [7]. In order to increase the number of respondents, as well as the quality of their responses questioning should be conducted under the supervision of the curator or consultant.

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LEGAL ENSURING OF THE ONCOLOGY CARE TO THE POPULATION OF THE REPUBLIC OF SAKHA (YAKUTIA)

ABSTRACT

Research purpose was development of suggestions for improvement of regulatory legal base of system of the oncological help to the population of the Republic of Sakha (Yakutia). Object of research was the oncological service of the region, and an object of research – its standard legal support. According to the author, priority the directions of development of the oncological help to inhabitants of the republic are enhancement of organizational structure of oncological service of the region, development of organizational regulations, standards of quality control of the organization of the oncological help, target indicators of medical productivity and cost efficiency of the oncological help at stages of its rendering, and also efficiency audit.

Keywords: Republic of Sakha (Yakutia), oncological help, standard legal support.

INTRODUCTION

Currently, the organisation of the oncological care to the population in the Russian Federation is regulated by a number of normative legal acts and methodological recommendations.

Order of the Ministry of health of the Russian Federation of 15 November 2012 915н N "On approval of the procedure of rendering of medical aid to adult population on the profile of "Oncology" (further – the Order) in accordance with article 32 of the Federal law from November 21, 2011 N 323-FZ "About bases of health protection of citizens in the Russian Federation" establishes the types, conditions and forms of providing medical care, and in accordance with article 33-36 allocates for patients with cancer, primary pre-medical, medical and specialized, including high-tech, health care, and palliative care and rehabilitation.

Further, in the Order in accordance with the organizational structure of cancer care from the primary Oncology to the cancer clinic and its separate structural divisions defined by the rules of the organization of their activities, recommended staff requirements and equipment standards.

Order of the Ministry of health of the Russian Federation from October 31, 2012 560н N "On approval of the procedure of rendering of medical aid in the field of pediatric Oncology" in a similar vein.

However, significant shortcomings of the Orders is the fact that they do not describe the organization of early detection, registration, treatment and dispensary observation of patients with malignant neoplasms in the basic structural units of primary health care: rural health posts, medical clinics, General medical practices (family doctors), district hospitals and examination rooms of healthcare organizations. Accordingly, in Orders, in relation to specified structures do not exist: the risk of the development of the oncology; diagnostic standards for the identification of neoplasms and the diagnostic studies; school report equipment medical equipment, order of referral and form of accounting and reporting documentation.

Guidelines, published in the period from 2007 to 2010 and prior to the publication of Orders, take a systematic approach under the guidance of chief non-staff specialist oncologist of Ministry of health of Russia, academician of RAMS V. I. Chissov on the organization, diagnosis and treatment of cancer from primary care physicians, examination rooms in primary Oncology clinics and cancer clinics. They also considered aspects such as planning of cancer care, methods of assessment of activity of cancer service screening and prevention, socio-labor rehabilitation of cancer patients.

However, in the manner and in the guidelines no targets and indicators for medical effectiveness and economic efficiency, and also indicators of efficiency of use of resources (logistical, financial, labor and information) and the

standards organization quality of cancer care at all stages of delivery – from FAP to specialized cancer clinics (centers) of regional and Federal subordination.

The program of state guarantees of free rendering to citizens of medical aid (further – the Program), adopted annually by the Government of the Russian Federation, in section III "List of diseases and conditions, medical assistance which is free of charge, ..." specifies, that when tumors of the citizens health care is free. Section IV of the Program "Financial support for the Program" establishes that the source of the Programme financing are the funds of compulsory medical insurance. The program also sets forth the average ratio of the volume of medical care (section V) and average standards of financial expenses per unit of volume of medical aid, the average per capita funding norms, ways of payment for medical care, formation and structure of tariffs for payment of medical assistance (section VI), as well as the criteria of accessibility and quality of medical care (section VIII), including:

– mortality from neoplasms, including malignant, including urban, rural population (the number of deaths from neoplasms, including malignant, per 100 thousand population);

– the proportion of patients with malignant neoplasms consisting on the account since the diagnosis 5 years or more in the total number of patients with malignant neoplasms consisting on the account;

– proportion of the number of patients with malignant tumors identified at the early stages in the total number of patients with newly diagnosed malignancies.

In the system of normative right of providing oncological care to the population the importance of standards of care that reflect the entire list of malignant neoplasm in accordance with ICD-10 and are divided into standards of primary health care, standards of specialized medical care and standards for palliative care [2]. In addition, specialists of the Association of oncologists of Russia developed clinical practice guidelines for the diagnosis and treatment of malignant tumors of different localization [1]. As of 01.01.2016 developed clinical guidelines for 57 diseases.

The decree of the President of the Russian Federation of 7 may 2012 No. 597 On measures to implement state social policy" initiated the development and establishment of professional standards of health workers, which represent the characteristics of the qualifications required of workers to carry out a certain type of professional activity. Currently, in Oncology developed two types of professional standards: specialist in Oncology (surgery) and specialist in Oncology (drug therapy). Both standards reflect the fundamental purpose of the profession, sections of "Generalized work function" and "job function", as well as requirements for education and training, practical experience, employment action, necessary skills, knowledge, etc.

Thus, at the Federal level, also has a fairly complete legal and regulatory framework the organisation of the oncologic help to the population of the Russian Federation.

The **purpose** of this study was to develop proposals for improving normative legal basis of system of the oncological care to the population of the Republic of Sakha (Yakutia).

MATERIAL AND METHODS

The object of study was the system of the oncology care to the population of the Republic of Sakha (Yakutia), and the object of the study is its normative-legal ensuring. Used is information-analytical method of research.

THE RESULTS AND DISCUSSION

The Ministry of health of the Republic of Sakha (Yakutia) to improve the organization and increase of quality of rendering of the oncological help to the population of the Republic, in accordance with the order of Ministry of health of Russia 15.11.2012 N 915-n "On approval of the procedure of rendering of medical aid to adult population on the profile of "Oncology", approved by decree of June 10, 2014 01-07 N/1024 "On approval of the Procedure of rendering of medical aid to adult population with oncological diseases on the territory of the Republic of Sakha (Yakutia)".

The order approves:

1. The structure of the organization of medical aid to cancer patients in the territory of the Sakha (Yakutia).

2. The order of routing patients with suspected or detection of malignant neoplasm in medical institutions of Sakha (Yakutia).

3. The scope of activities for identifying, TESTING and providing medical care to cancer patients in medical institutions of different levels.

4. Procedure referral patients with malignant neoplasm and precancerous diseases. Analysis of the approved procedure of the organisation of the oncologic help to the population of Sakha (Yakutia) has allowed to establish that the organizational structure of medical care to cancer patients in the territory requires clarification.

So, the primary Oncology clinics of Central regional hospitals and medical institutions of Yakutsk referred to the first level (primary health care). However, in accordance with part 5 of article 33 of "Primary medical-sanitary aid" of the Federal law of 21.11.2011 year N323-FZ 31.12.2014) "On the basis of health protection in the Russian Federation" properly attributed to the primary specialized health care, as in their structure appear oncologists.

Analysis of order routing of patients with suspected or detection of malignant neoplasm in medical institutions of Sakha (Yakutia) has allowed to establish that it is:

1. The clarity what diseases in accordance, what stage, what kind of profile departments of the medical organization treating patients with malignant neoplasm.

2. Clarity as to what type of patients are sent for receiving of high-tech cancer care in specialized Federal health care.

3. Provisions on the examination room for outpatient clinics I level.

4. List of functions of the medical organizations at the levels of cancer care, presented in Appendix 3 (column 3) of the order of Ministry of health of Sakha (Yakutia) from June 10, 2014 N 01-07/1024 that is not in the list of functions set out in the order of the health Ministry of the Russian Federation of 15.11.2012, 915-n "On approval of the procedure of rendering of medical aid to adult population on the profile of "Oncology" in terms of the rules of the organization primary activities of the Oncology office and cancer center.

5. The list of obligatory actions performed on the stages of rendering of the oncological help to the population, as well as standard preventive examination to identify tumors of visual localization.

6. The list of persons from risk groups, as well as rare diseases in which patients with malignant tumors are subject to dispensary observation.

7. Full volume of information provided at the dispensary observation of patients with malignant neoplasm and individuals at risk. In Order to part of follow-up are not reflected by the clinical groups of dispensary observation of cancer patients, nosological forms of diseases, subject to dispensary from the doctors of different specialties under the supervision of a medical oncologist, the procedure of conducting the medical documentation.

8. Organizations provide emergency and palliative care to patients with malignant neoplasms.

9. Modalities of cancer patients on medical-social examination.

10. Organizational-methodical provision of the anti-cancer activities.

11. Indicator of medical effectiveness and economic efficiency at every stage of the organization of work on identification, prevention, treatment and dispensary observation of patients with cancer and individuals at risk.

12. The quality control standards of the organization of cancer care in terms of detection, prevention, treatment and dispensary observation of patients with cancer and individuals at risk.

In addition, in the region absent:

1. The order of rendering of medical aid in the field of pediatric Oncology".

2. The position of freelance main oncologist of Ministry of health of the Republic of Sakha (Yakutia), whose task is the organization of cancer services in the region.

3. Normative-legal ensuring of performance audit of the oncological help to the population in terms of detection, prevention, treatment and dispensary observation of patients with cancer and individuals at risk.

The resolution of the Government of the Republic of Sakha (Yakutia) of December 30, 2014 N517 approved the Program of state guarantees of free rendering to citizens of medical aid in the Republic of Sakha (Yakutia) Republic for 2015 and on planning period 2016 and 2017.

Section IX of the Program, Criteria of accessibility and quality of care" in terms of cancer care identified only three indicators:

- mortality from tumors, including malignant (the number of deaths from neoplasms, including malignant, per 100 thousand population);

- the proportion of new cases of oncological diseases at early stages (stage I and II) of the total number of detected cases of cancer in the course of the year;

- the proportion of patients with malignant neoplasms consisting on the account since the diagnosis 5 years or more in the total number of patients with malignant neoplasms consisting on the account.

Tariff agreement on payment for medical care provided in volume of the Territorial program of obligatory medical insurance of the Republic of Sakha (Yakutia) In addition, there are separate tariffs for the provision of cancer care in 11 of the 34 district hospitals in remote areas of the country, for the provision of palliative care, as well as tariffs for rendering of hi-tech medical aid in the medical organisations located outside the Republic of Sakha (Yakutia).

However, the existing normative legal provision does not solve all problems as the organisation of the oncologic help to the population and control the quality of cancer care.

In terms of updated Federal legislation on health care to improve the quality and accessibility of oncological assistance to the population of Sakha (Yakutia), in our opinion, it is necessary to revise the Order of organization of oncological aid to the population of Sakha (Yakutia) based on previously made observations and further develop the following:

1. The order of organization of oncological aid to the population in the medical organizations of various levels.
2. The procedure for the provision of palliative care to patients with malignant neoplasm.
3. The regulation on the examination room for outpatient clinics I level.
4. Regulations on the organization of emergency medical care to patients with malignant neoplasm.
5. Organizational and technological standard diagnostic, therapeutic, and preventive procedures for patients with malignant neoplasm and members of the risk group of diseases
6. Targets medical effectiveness and economic efficiency of cancer care at the stages of its rendering.
7. Standard quality control organization of cancer care in terms of detection, prevention, treatment and dispensary observation of patients with cancer and individuals at risk.
8. The mechanism of audit of efficiency of the oncologic help to the population in terms of detection, prevention, treatment and dispensary observation of patients with cancer and individuals at risk.
9. The position of freelance main oncologist of Ministry of health of the Republic of Sakha (Yakutia).

CONCLUSION

Thus, the analysis of the legal and regulatory framework oncology care to the population of the RS (I) evidence of need for its further improvement. The priorities are the improvement of the organizational structure of cancer services in the region, development of institutional regulations, quality control standards organization of cancer care that targets medical effectiveness and economic efficiency of cancer care at different stages of its provision, as well as audit efficiency.

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PRACTICAL EDUCATION: TRAINING OF NURSING CARE COMPETITIVE SPECIALISTS

ABSTRACT

Practical training is aimed at comprehensive development of learners of all types of professional activity in the field of medical education, the formation of general and professional competences, as well as the acquisition of the necessary skills and practical experience.

Practice-orientation of the educational process is a system of successive specific actions and methods of education, leading to planned results of the organization of educational process in Yakutsk College of Medicine. Modern learning technologies contribute to the integration of teaching and learning and professional practice of students.

Keywords: practical training, competence, practical orientation, employment, professional education, educational standards.

Practical training is aimed at comprehensive development of learners of all types of professional activity in the field of medical education, the formation of general and professional competences, as well as the acquisition of the necessary skills and practical experience. Today, mid-level health worker must be able to assess problems of patients make their own decisions and implement them. These requirements are reflected in the practical training of future professionals and contribute to the quality of professional education as defined by the Federal Law of the Russian Federation dated December 29, 2012 N 273-Federal law "About Education in the Russian Federation", the Federal Law of the Russian Federation of November 21, 2011 N 323-Federal law "the basis of public health protection in the Russian Federation", the federal state educational standards of the field of professional education.

The main direction of improvement of vocational education in secondary professional education is a practical orientation. For maximum approach to practical health care, as well as the primary formation of practical experience and professional competence of students in the 2013-2014 academic year in the Yakutsk medical college for a simulation training rooms were created by manipulation, equipped with necessary medical equipment and tools. These manipulative offices preclinical practice formed the first skills in their chosen profession, simulated professional activities of nurses, according to the algorithm are fulfilled and performed all the manipulations on models and phantoms.

Practice-orientation of the educational process is a system of successive specific actions and methods of education, leading to planned results of the organization of educational process in Yakutsk College of Medicine. Modern learning technologies contribute to the integration of teaching and learning and professional practice of students.

High-quality training of future nurses is not possible without close cooperation with the College of practical public health. College principal social partners in the creation of conditions for practical training are medical organizations - the clinical database Republican Hospital №1, Republican Hospital № 2, Republican Hospital № 3 "Yakutsk City Hospital," Medical "Yakutsk" city center, Children's City Clinical Hospital № 2, polyclinic №1, №5 Yakutsk, Sakha republican skin and Venereal Diseases clinic, "Yakut republican Eye Hospital", Yakut Republican Oncology Center, City Hospital №3 and others. Step practical training in a medical institution is responsible, it requires the formation of not only professional competence but also the development of personal qualities of the student, such as communication skills, ability to work, to exercise due diligence and compassion to every patient, also instilled the ability to work in the workforce environment, conducting research work to perform final qualifying works.

Ministry of Health of the Republic of Sakha (Yakutia) annually carried out the planned work on the distribution and employment of graduates of the Yakut Medical College. According to the plan of joint activities to the distribution of an annual meeting organized by the traditional college graduates with head physicians of the Central district hospitals where vacancies are available in the field and provided social guarantees. graduates employed an average of 89% to 94%. In 2014, the college became the winner of the All-Russian contest "The Best Medical College - 2014" in the category "Employment and job placement of graduates."

Yakutsk Medical College participates in the movement of WorldSkills Russia the aim of which is to raise the status and standards of vocational training since 2014, when the first organized at the II Regional Championships in Yakutsk in the sports complex "50 years of Victory" area of competence for "Patient Care", where April 1-2, 2014 attended by students from three medical colleges of the Republic of Sakha (Yakutia). Adequately presented Yakut medical college students Sadovnikova Lubov and Nurguyaana Afanasyeva, who took respectively the I and III places at the II Regional Championships. The winner of the II Regional Championship Sadovnikova Lubov from 16 to 20 May 2014. in Kazan took part at the II National Championship WorldSkills Russia - 2014 and won 3rd place was awarded a bronze medal. In 2015, March 6 organized and held III Regional Championship of professional competence "Nursing" at the Medical College of Yakutsk with 4 colleges (3 College -Respublic of Sakha (Yakutia) and the Blagoveshensk city), 1 place was taken by a student of the Yakut Medical College Alena Martynova. Next April 16-19, 2015. There was organized platform for the professional competence of the "Nursing" and had a semi-final of the Far Eastern Championship WorldSkills Russia in the sports complex "Triumph", 1 place was taken by a Yakutsk Medical College student Martynova Alena.

Thus, in three years we actively participate, organize the site and conduct the competition at a high level. At the level of the Republic of Sakha (Yakutia) organized and held - 3 Regional Championship Semifinal 1 Far Eastern Federal District, visited by 2 and 1 National Championship Semifinal Far Eastern Federal District.

All the achievements of teachers and students of the Yakutsk medical college championships WorldSkills Russia, the All-Russia competitions, conferences, are an indication of high level of training competent future skilled, creative professionals, meeting the requirements of the social order of the Republic of Sakha Health (Yakutia).

Practical training in Yakutsk College of Medicine contributes to the preparation of professionally trained, competitive future nurses to meet modern of Health requirements, as noted by the Deputy Director of the Department of Medical Education and personnel policy in public health services of the Russian Federation Ministry of Health Kupeeva Irina at the retreat of the Russian Federation Ministry of Health "On the provision of medical care in remote and sparsely populated areas, the development of air ambulance in the Far East ...", which was held on June 9th 2016 in Yakutsk. Thus, we set new ambitious plans before the health of the republic and it obliges the educational institution to improve the quality of the practical training of students.

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ROLE OF ELEMENTAL IMBALANCE IN SEPARATE PATHOLOGIES DEVELOPMENT IN CHILDREN OF THE VILYUYSKY REGION

ABSTRACT

It was investigated Vilyui child population of the region and the city of Yakutsk in the age from 6 to 10 years to study the characteristics of the element status of children Vilyui region and its influence on the prevalence of dental caries. The study found that children living in these regions, there are many violations of the content of chemical elements, which gives grounds to assume an important role of diselementosis in the pathogenesis of dental caries.

Keywords: micro- and macro elemental imbalance, dental caries, environment, Republic of Sakha (Yakutia).

A complex medical-biological monitoring examinations of the environment and health state of the population of the villages and cities located along the Vilyuy River have been acted under the urging of the public and scientific institutions of the republic since the end of the 80s of the XX century in the Vilyuysky region of Yakutia. The work was carried out by the staff of institute of applied ecology of the North and medical institute of the North-eastern federal university. Long-term researches have confirmed negative influence of the happening processes on medical-demographic indicators of population's health of the Vilyuysky region (Mirny, Suntar, Nyurba, Verkhnevilyuysk, Vilyuysk uluses). High incidence of diseases of digestive, cardiovascular, musculoskeletal systems, cases frequency of malignant tumors and congenital development anomalies, pathology of pregnancy and childbirth have confirmed the accumulation of subtoxic and toxic doses of industrial poisons, chemical pollutants on the human health. Nowadays the ecological situation in connection with the falling of parts of the carrier rocket "Sous-2.1a" started from the East spaceport has joined negative factors of anthropogenous influence, including excess heavy metals and deficiency of the vital chemical elements. These facts influenced on the modern scientific researches in the diamond-mining province. They study deep mechanisms developing in organism under the influence of separate or a complex of ecological factors. So, there are many data that the macro and microelement structure of food and drinking water exerts impact on prevalence and the course of various somatic pathologies, including caries of teeth and its complications [2,3,7].

Micro-elements often are the component of proteids and obligatory component of apatite crystals of teeth tissue. In the first case, they are the active centers of enzymes of protein synthesis and exchange processes in tissues. In the second case, being built in a crystal lattice of apatite, they change physical-chemical state and change its solubility. Minerals can act on processes of mineralization and demineralization in norma and pathology.

Recently the attention is paid not only to minerals, but also their balance in an organism and ranging of risk factors of pathology developing among the population. M. V. Veldanova has found the influence of macro – microelements imbalance on the development and course of endemic goiter [9]. Mn and Cd, deficiency of P, K, Se and Zn efficiency of corrective influence of iodine on the disease decreases and microelement analysis of hair as an effective method of identification of goitrogen complex is recommended. Similar results received by A.N. Karchevsky revealed imbalance in association chain of "iodine: manganese: cobalt: zinc, chrome: lead", characteristic of the children living in the industrial city [10]. The author draws a conclusion about microelements imbalance as a cause of iodine deficiency disorders against iodine insufficiency.

The expressed anticariogenic activity was proved only of minimum minerals. Despite numerous researches on microelement studying of teeth, the exact answer about a role of many elements wasn't present still. It is impossible to make a conclusion about the role of these minerals in enamel structure formation on the basis of increased level of nickel, arsenic, silicon and zinc content in temporary teeth among children of Yakutia. Therefore, in the Republic of

Sakha (Yakutia) the leading role in caries developing belongs to fluorine deficiency in water, soil, microelements deficiency of food and also photoperiodism in the North [8].

Thus, the role of physiological and biochemical reactions of organism in response to action of ecotoxicants remains topical issue.

The **purpose** of our work - studying of features of the elemental status among children of the Vilyuysky region and its influence on prevalence of dental pathology - teeth caries.

MATERIALS AND METHODS

The research abstract of the children's population of Nyurbinsky and Verkhnevilyuysk uluses of the Vilyuysky region and Yakutsk aged from 6 till 10 years old was presented in the article. The first group (main) included 50 children of the Yakut nationality living in the diamond-mining Vilyuysky region of Republic of Sakha (Yakutia) from the moment of their birth (Nyurbinsky and Verkhnevilyuysky uluses). The second group included 50 children of the Yakut nationality who are natives and constantly living in Yakutsk. The work was carried out with application of noninvasive methods of researches.

The cohort examination was conducted with the ethical standards of Helsinki declaration and European community Directives (8/609 EU) (2000), received informed consent of lawful representatives of children to participation in research.

24 chemical elements in hair of children has been investigated by system of the multielement analysis with AES-ICP and MS-ICP methods. Definition of elemental structure of bio-substrates (Al, As, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Li, Mg, Mn, Na, Ni, P, Pb, Se, Si, Sn, Ti, V, Zn, mkg/g) was carried out by methods of atomic emission spectroscopy and mass spectrometry with плазмой inductive coupled argon plasma (AES-ICP, MS-ICP) by the technique approved by Ministry of Health of the Russian Federation (S. I. Ivanov and others 2003; L.G. Podunova and others, 2003) in experimental laboratory of ANO "Center of biotic medicine", Moscow (accreditation certificate of ГСЭН.RU.ЦОА.311, registration number in the State register of Russia RU.0001.513118 of May 29, 2003).

Case rate of 2113 children of country and urban population aged from 6 till 10 years old since 2000 to 2013, analyses of primary medical documentation (ф025/у), materials of medical examinations of children by pediatricians has been studied. The analysis of diseases of children has been carried out according to the International classification of diseases X revision. Prevalence, intensity of teeth caries and hygienic status were estimated by Fedorova-Volodkina's index.

Statistical processing of research results was carried out with the program "Microsoft Excel XP", "Statistica 6.0." and included descriptive statistics, assessment of reliability of distinctions by Student's coefficient and correlation analysis with assessment of coefficients reliability of correlation.

RESULTS

The comparative analysis of the average values of concentration of micro-macroelements in hair of the children who are constantly living on the territory of the Vilyuysky region of the Republic of Sakha (Yakutia) with the group of comparison (Yakutsk), has shown existence of statistically reliable difference by many chemical elements (tab. 1).

Table 1

Average values of micro-macroelements content in children's hair in the Republic of Sakha (Yakutia) living in Vilyuysky region and Yakutsk, mkg/kg

Element	Vilyuysky region, Republic of Sakha (Yakutia)		Yakutsk
	Nyurbinsky region	Verkhnevilyuysky region	
1	2	3	4
Al	**18,87±2,7**	12,28±1,18 *	11,37±0,79
As	0,05±0,004	0,05±0,002	0,04±0,002
Be	0,01±0,001	0,01±0,001	0,01±0,001
Ca	**381±34**	**350±26**	676±48
Cd	0,12±0,02	0,06±0,01	0,08±0,02
Co	0,03±0,004	0,02±0,003	0,02±0,001
Cr	**0,43±0,07**	0,68±0,03 *	0,65±0,04
Cu	**10,08±0,16**	**9,77±0,23**	13,52±0,98
Fe	**30,06±1,21**	34,46±2,24	37,08±2,16
Hg	**0,24±0,04**	**0,37±0,05**	0,16±0,01
K	**341±47**	429±98	586±81
Li	**0,03±0,003**	0,02±0,002	0,04±0,002
Mg	68,6±10	79,7±14	74,1±5,9
Mn	**3,51±0,5**	**2,54±0,43**	1,03±0,1
Na	518±81	637±220	664±89
Ni	**0,33±0,06**	**0,42±0,08**	0,74±0,12
P	131±3	135±3	137±3
Pb	**6,12±0,75**	**3,79±0,57**	2,1±0,35
Se	**0,14±0,01**	**0,12±0,01**	0,22±0,01
Si	22,89±1,69	23,68±1,45	23,93±1,57
Sn	0,16±0,02	**0,08±0,01**	0,2±0,03
Ti	**0,55±0,04**	**1,14±0,06 ***	0,92±0,06
V	0,06±0,01	0,07±0,01	0,07±0,01
Zn	**108,78±5,8**	**153,67±8,21 ***	177,84±7,29

Note: bold print - reliable difference in comparison with Yakutsk ($p<0,05$); *-reliable difference between two regions ($p<0,05$)

It should be noted that children of the Nyurbinsky region have Pb and Mn concentration in hair was maximum among all examined children.

Children of the Verkhnevilyuysky region unlike children of Yakutsk were characterized authentically ($p<0,05$) by lowered concentration in hair of Ca (350±26 and 676±48 mkg/g), Cu (9,77±0,23 and 13,52±0,98 mkg/g), Li (0,02±0,002 and 0,04±0,002 mkg/g), Ni (0,42±0,08 and 0,74±0,12 mkg/g), Se (0,12±0,01 and 0,22±0,01 mkg/g), Sn (0,08±0,04 and 0,2±0,03 mkg/g), Zn (153,67±8.21 and 177,84±7,29 mkg/g). At the same time, higher concentration in hair of Hg (0,37±0,05 and 0,16±0,01 mkg/g), Mn (2,54±0,43 and 1,03±0,1 mkg/g), Pb (3,79±0,57 2,1±0,35 mkg/g), Ti (1,14±0,06 and 0,92±0,06 mkg/g) was in children of the Verkhnevilyuysky region than in children from Yakutsk.

The analysis of the obtained data showed reliable increase of aluminum, mercury, lead –chemical elements possessing toxic action in hair of children of the Vilyuysky region.

More expressed extent of changes of separate elements concentration in children's hair of the Nyurbinsky region attracts attention when comparing element structure of hair of the children living in the Nyurbinsky ulus with data of the children living in the Verkhnevilyuysky ulus. So, Al, Cr, Ti, Zn in hair of children of the examined uluses authentically differ among themselves.

Thus, children living in the Vilyuysky region of the Republic of Sakha (Yakutia) substantially are affected by toxic elements influence, such as aluminum, lead, mercury. Concentration of lead - one of the most widespread elements of pollutants - exceeds the recommended level of normal physiological contents, equals 5 mkg/g in hair of children of the Nyurbinsky ulus [5,6].

The comparative assessment of elemental profile of children of the Vilyuysky region and Yakutsk was presented in table 2.

Table 2

The excess and insufficient content of elements in children of Vilyuysky region of Republic of Sakha (Yakutia) and Yakutsk

Residence	Elemental profile	
	Excess amount	Deficiency
Vilyuysky region	Cr, Mn, Fe, Na, Mg, K, Pb	Se, Co, Cu, Zn, P, Ca, Mg, Cr
Yakutsk	Cr, Mn, Fe, Na, Mg, K, Zn, Ca	Se, Co, Zn, P

Note: elements which frequency of deviations in contents exceeds 30% were included (20% for toxic elements).

The submitted data, in the surveyed region and in Yakutsk have noted hyperelementosis in 6 elements – Cr, Mn, Fe, Na, Mg, K. At the same time, the increased content of lead was found in hair of children of the Vilyuysky region and in Yakutsk – zinc and calcium. The special attention was given to the high content of lead which was observed among 46% of children of the Nyurbinsky region and among 24% of children of the Verkhnevilyuysky region. The lowered concentration of 4 elements – Se, by Co, Zn, P was observed in children of the Vilyuysky region and children of Yakutsk. Besides, hyperelementosis of Ca, Mg and Cr was observed in children of Nyurbinsky and Verkhnevilyuysky uluses and not found in children of Yakutsk.

On the basis of the analysis of frequencies of chemical elements deviation in hair of children of the Vilyuysky region it was possible to make a conclusion about high frequency of disorders of considerable chemical elements concentration. On average, 70% to 80% of children had disorders by 6 – 8 elements. Thus, it is possible to speak about presence of characteristic element profile among children of the Vilyuysky region in comparison with children of Yakutsk.

The analysis of the examined children aged from 6 till 10 years old in Nyurbinsky and Verkhnevilyuysky regions has shown that the most widespread were diseases of gastrointestinal tract (1302,4 ‰) which prevalence was nearly 8 times higher, than in Yakutsk. 77,0% of teeth caries was in the examined region; pathology of gall bladder and bile ducts – 31,7%; gastroduodenal pathology has been found in 13,8% of children. Our results were coordinated with I.D. Ushnitsky research data, examining dental health of children of 7 - 12 years old of the Vilyuysky region. He has revealed nearly 100% prevalence of caries which pathogenesis was low enamel acid resistance and weak mineralizing saliva potential because of low concentration in calcium and inorganic phosphorus [8]. Scientific works have many data that macro-microelement structure of food and drinking water exerts impact on prevalence and course of teeth caries that allows to consider this disease as ecological pathology [8,2,3,7].

So, caries intensity is influenced by concentration of calcium and magnesium in water which defines its rigidity. It is considered that the water is softer; the caries affection of solid tissues of tooth is higher and vice versa. The increase of its mineralization degree was revealed while studying the mechanism of isoionic exchange in hydroxyapatite crystals in surface short-term treatment of enamel solution containing magnesium ions, which was expressed by increase of resistance to action of demineralizing factors and reduction of speed of enamel dissolution on phosphorus and selective emission of magnesium ions in solution promoting preservation of homeostasis in enamel. Besides, magnesium is necessary for activation of alkaline phosphatase. Besides, influence of deficiency of fluorine, copper, zinc, cobalt in water on the microhardness dentine decrease has been proved. More active course of caries was noted in environment zinc deficiency by G.D.Ovrutskim [10]. Cobalt and manganese exert impact on development of bones by alkaline phosphatase activation. Strontium and barium inhibit alkaline phosphatase, causing processes of mineralization. At the same time, strontium and barium can force out calcium from bone tissue, changing its quality to the worst aspect.

Our research has revealed that children living in Verkhnevilyuysky and Nyurbinsky regions with caries have disorders of many chemical elements concentration, including excess of iron (54,3%), lack of cobalt (97,1%), selenium (85,7%), zinc (80%), copper (60%), and imbalance of manganese (74,3%), calcium (54,3%), sodium (54,3%), chrome (51,4%). Higher prevalence of teeth caries in the Vilyuysky region, in comparison with Yakutsk gives the grounds to assume an important role of diselementosis in pathogenesis of this disease among examined children.

CONCLUSION

Thus, the revealed micro-macroelements imbalance among examined children living in the Vilyuysky region of the Republic of Sakha (Yakutia) is an indicator factor in the development of pathological processes including oral cavity and assumes the preclinical preventive events directed to imbalance overcoming.

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MEDICAL-GEOGRAPHICAL CHARACTERISTIC OF THE NORTH AND MODERN ASPECTS OF IMPROVEMENT OF THE DENTAL HELP

ABSTRACT

Severe accommodation conditions of the population have a negative influence on the functional condition of all organism, including organs and tissues of the oral cavity in the North. The diseases of organs of the respiratory system in the form of chronic tonsillitis, quinsy, bronchitis, etc. are most often met in the structure of somatic diseases. At the same time the chronic obstructive pulmonary disease is characterized by the system symptoms including cardiovascular pathology, osteoporosis, metabolic disorders and endothelial dysfunction. But, at the same time, patients of the Yakut nationality have been observed heavier symptoms of the combined course of chronic bronchitis, chronic obstructive pulmonary disease and metabolic syndrome in comparison with the group without metabolic syndrome.

In the conditions of the North lipid exchange becomes more active when the power exchange changes from "carbohydrate" to "fatty" type which can lead to the cholesterol reservation in vessels intima with the subsequent development of atherosclerosis that in turn can lead to the development of pathological processes of parodontium tissues of exchange and dystrophic character and define need for the dental help. Thus people of the senior age group show the high level of prevalence of pathological processes of maxillodental system and respectively high level of need for the specialized dental help.

One of the links of improvement of the dental help to the population is the school dentistry. school dentistry in the country during the last period has been developing but not with the necessary rates. In this regard, the school age is the most optimum period of preventive methods from physiological and pathogenic points of view.

Dental personnel supply influences on the rational organization of the treatment-and-prophylactic help to the population. Nowadays in rural areas there is great insufficiency of medical staff. Such situation exerts negative impact on the organization of medical and preventive actions among the population. So, the improvement of the dental help to the population requires systematic strengthening of material and technical resources and personnel supply of treatment-and-prophylactic institution in the region.

In general, it is necessary to develop and introduce the scientifically based recommendations considering specific regional features for optimization of health care to inhabitants of the North

Keywords: northern territories, climatic conditions, sanitary culture, somatic diseases, medical care.

Severe accommodation conditions of the population have a negative influence on the functional condition of all organism, including organs and tissues of the oral cavity in the North [4, 42]. In these conditions the organism functions on its physiological opportunities limit, at almost full mobilization of functional reserves [35]. In this regard, studying of adaptation and disadaptation problems of the organism in the conditions of high latitudes is an actual medical-social task.

The Republic of Sakha (Yakutia) is the largest subject of the Russian Federation. The region occupies the territory with a total area of 3104 thousand square kilometers and has a difficult and diverse relief – from ridge mountains to the boggy tundra lowlands which are poorly raised above the sea level [50]. The mountain landscape occupies two thirds, lowlands – one third of the territory [44]. Almost all territory of the republic except for extreme southwest areas, is in the zone of continuous permafrost which power can reach 300-1500 meters. A half of the territory of the republic is located behind the Polar circle. Yakutia is the only region in the world with sharply continental climate.

The Republic of Sakha (Yakutia) has no analogs on absolute value of the minimum temperature and its total duration in a year in the northern hemisphere where amplitude of fluctuations of air temperature exceeds 100 °C [1, 14].

The high duration of light day "a light excess" during the summer period, long winter polar night "light starvation", existence of the long periods of the increased atmospheric pressure with critically reduced partial pressure of oxygen should be noted among climatic features of the North [50].

It should be noted that the balanced diet is important in severe climatic conditions of the North [24]. It is known that consumption of proteins and fats much more important for normal functioning of organism and health maintenance in inhabitants of high latitudes than in inhabitants with temperate climate [43, 56]. At the same time lipid exchange becomes more active when the power exchange switches with "carbohydrate" to "fatty" type [51, 69] which can lead to cholesterol deposit in vessels intima of with the subsequent development of atherosclerosis [21, 68] that in turn can lead to the development of pathological processes of parodontium tissues of exchange and dystrophic character.

According to the conducted researches inhabitants of the North showed increase of frequency of diseases of the digestive tract with the age where their comorbide course with arterial hypertension, respiratory and urinogenital systems are defined. At the same time, united pathogenic mechanisms of development of the diseases making this combination demands carrying out a number of researches [5]. Meanwhile, in the conditions of high latitudes there is a problem the gastrointestinal disorders in population. So, the high frequency of symptoms of gastrointestinal reflux and syndrome of the irritable bowel in women and indigenous people was defined [31]. At the people living in conditions of high latitudes changes of glucose-insulin indicators at the verified coronary atherosclerosis were noted. At the same time increase of S-peptide level, insulin and HOMA-IR index in comparison with persons without coronary heart diseases where coronary atherosclerosis closely correlates with the increased level of glucose, insulin were revealed. These facts correspond the starting moments of development of atherosclerosis which are connected with hyperinsulinemia and an insulin resistance [65, 74]. At the same time climatic, physiographic and ethnic factors exert impact on expressiveness of coronary arteries calcinosis in the conditions of the North. So, there are more patients with ischemic heart disease in combination with arterial hypertension among indigenous males and females than non-indigenous people [3].

Severe climatic conditions cause the development of diseases of respiratory organs. At the same time the chronic obstructive pulmonary disease is characterized by systemic manifestations including cardiovascular pathology, osteoporosis, metabolic disorders and endothelial dysfunction [76]. So, the combined course of chronic bronchitis, chronic obstructive pulmonary disease and metabolic syndrome in people of the Yakut nationality has observed heavier clinical course in comparison with the group without metabolic syndrome [6]. Meanwhile the frequency of metabolic syndrome among indigenous people 1.5-2.0 times is less, than among non-indigenous, males less than females [18]. The high level of frequency of such social important disease as tuberculosis where the males of working-age who are often suffering from nicotine and alcoholic addiction are ill more often in the North. They have multiple medical resistance of tuberculosis mycobacteria to antituberculosis preparations [12]. Among children and teenagers the complicated course of primary tuberculosis in the form of bronchopulmonary affection and generalization of process with the affection of other organs and systems is met more often [57].

In the conditions of cold impact on the human body there is a generation stimulation of the active forms of oxygen exerting impact on processes of lipids peroxidation which are necessary for power providing in the conditions of the increased heat production [13]. It has been experimentally proved that long cold influences on the reliable increase of diethenoid conjugates and accumulation of lipids hydroperoxides, and also content of malonic dialdehyde in blood. In this regard the preparation "Cytoflavin" is recommended for cold stress for regulation of adaptation reactions of organism [13].

It is important to emphasize that recently there were data of features of adaptation of children in severe climatic conditions [53]. So, values of hormones levels of hypophysis, thyroid gland, sex hormones ethnic features among

Sakha children and minorities of the North of Yakutia living in identical climate-geographical conditions haven't been revealed [7].

Optimum adaptation of organism to environment conditions mostly depends on the condition of immune system when the population has the width dependence of immunological indicators. At the same time, the high frequency of cases of the increased synthesis of immunoglobulins connected with a heavy immunity work in the native population was established [16, 75]. The light regime connected with desynchronization of internal clocks of organism is the leading factor influences on the development of these changes where melatonin hormone which synthesis is directly connected with polar day and night plays immunomodulatory role [66, 67, 71].

North living conditions influences on oral cavity homeostasis which are connected with long and severe winter, short cold summer, low humidity, cyclic processes disorders in organism, sharp differences of atmospheric pressure, photofrequency disruption, close permafrost layer, etc. [4, 39, 49].

The inhabitants of high latitudes adaptable mechanisms of organism cause the specific types of metabolism connected with changes of homeostasis of electrolytes, proteins and lipids [29]. So, ultra-violet insufficiency promotes disorder of mineral exchange which makes impact on structural uniformity of solid tissues of teeth, expressed multiple defeat by teeth caries [9, 15, 49]. In this regard 6-7-year-old children are defeated by caries at once after eruption of the first molars [50, 70]. Such situation causes an adverse clinical situation on dental diseases of the population of the North [4, 33].

Nowadays the conducted researches have established that macro - and microelement structure of food and water exert important impact on resistance of solid tissues of teeth [9, 30, 36, 73]. The inhabitants of the North have specific food connected with protein-lipid type which is consumed much more, than residents of the Central Siberia and European part of Russia [24, 38]. But, at the same time, the inhabitants of the North have more hypervitaminosis when the level of vitamins B in organism is followed by seasonal dynamic fluctuations, the acute shortage of vitamin C, group B, E, A and D, and also the low level of mineralization of the main sources of drinking water which have certain values in caries pathogenesis [50, 60].

Conditions of accommodation of the population exert negative influence on the increase of indicators of prevalence and intensity of dental diseases among inhabitants in the north [27]. Besides, specific regional risk factor are settlements remoteness from each other, difficult transport scheme, organization of medical care, including prevention of dental diseases [49, 63, 78].

The researches demonstrate that severe climatic conditions influence on biophysical properties of oral liquid [4, 9, 50]. So, the inhabitants have the increased level of saliva mucoviscosity with the reduction in its rate of secretion and remineralizing potential, with the prevalence of 2 and 3 types of microcrystallization, and also decrease of the activity of alkaline phosphatase with decreased concentration of calcium, phosphorus, etc. which form the main local risk factors of the development of dental diseases [4, 27].

It should be noted that functional activity disorder of salivary glands creates negative background to permeability violation of enamel and promotes dental plaque. At the same time abundance of microorganisms in a plaque, especially str. mutans exert impact on the level of prevalence and intensity of pathological processes of solid tissues of teeth of demineralizing character, and also tissues of parodontium of inflammatory and destructive character [45]. Besides, the low level of sanitary culture in population which also creates prerequisites of development of the main stomatological diseases [16].

It is necessary to emphasize that social and economic changes happening during the present period definitely can affect the disease level of the population, especially among socially unprotected layers (disabled people, pensioners, children, teenagers, students, etc.) [4, 62]. Besides, such situation extremely complicates financing and activity of the special comprehensive programs directed to preservation and promotion of health of the population [32].

The inhabitants of the North showed the expressed hypervitaminosis, despite the range expansion of the food range of social and economic system of society, preserved foods and easy carbohydrate food are prevailed among

natives. At the same time insufficient ultra-violet radiation promotes the development of vitamin D insufficiency that leads to mineral exchange disorder in organs and tissues of oral cavity which somewhat can influence the frequency of caries of teeth [60].

Some authors claim that the level of dental diseases directly depends on duration of the period of accommodation of the biological individual in severe climatic conditions of the North [4]. In their opinion, there is a progressing course of pathological processes of organs and tissues of oral cavity with the age.

In the conditions of the Republic of Sakha (Yakutia) year-round water supply is absent in rural settlements where the ice is prepared for drink in winter which is characterized by extremely low content of fluoride and level of mineralization [39]. This situation can be considered as environmental risk factor of pathological processes of solid tissues of teeth of demineralizing character which often leads to complications of caries [49,50]. Besides insufficient staff and material and technical resources of the treatment-and-prophylactic establishments in rural settlements greatly influences on it [19]. This situation creates certain difficulties in availability of health care to the population that on the other hand defines lack of any complex preventive actions [4].

It should be noted that adaptable mechanisms of the human body in the conditions of the North is widely studied where existence of some of their features was revealed. So, physical development of children of the Yakut nationality from 0 to 7 years is estimated as average, "growth jump" in boys is observed at 3 years and 7 years old, in girls – at 4 and 7 years old where disharmonious development was defined among 1/3 of them [54]. At that time, physical development of children of similar age group of the European North corresponds to the general anatomical-physiological regularities of biological development of children's organism [25]. At the same time children of 6-7 years old are prevailed of caries of second teeth, it reaches high levels with affection of parodontium tissues with 1 sextant intensity [52].

At the present stage of the development of society one of the most important national objectives is further improvement of health care and prevention of dental diseases [26]. Despite broad studying of these problems, it remains to be unsolved. In this regard clinical stomatology searches for effective methods and warning facilities of the development of pathological processes of organs and tissues of oral cavity among the population [20, 72].

It is necessary to emphasize that in connection with the developed social and economic situation occurring for the last period I have considerably changed approach to planning and the organization of the dental help to the population [4, 64]. Extremely limited information devoted to questions of improvement of the organization of the dental help to the population in new conditions is provided in available literature [61]. In the international context prevention of diseases is considered to be the central element of health care improvement [41]. Modern prevention includes system of the state, social, hygienic, medical and personal measures aimed at providing high level of health and the prevention of diseases [37]. At the same time medical-social aspects in research of dental diseases of the population, its dependence from environment, material household, labor living conditions of the person and other factors are of great importance for strengthening of health of the population [10].

The researches have established that the low level of sanitary culture was defined among various age groups of the population [9, 23, 50]. At the same time the direct interrelation of unsatisfactory condition of dental health with rare visit to the dentist was noted [77]. This situation was confirmed by V. N. Sorokin (2006) and V. N. Grinin's data with others (2008) where the share of the population not asking for the dental help made 56% and more that made it impossible carrying out secondary prevention. The above causes emerge negative risk factors which exert impact on diseases indicators. On this background the most effective preventive action is rational hygiene of oral cavity with motivation of the patient about its efficiency in the prevention of various pathological processes of organs and tissues of the oral cavity [22, 55].

One of the improvements of the dental help to the population is the school stomatology where complex prevention and treatment is possible within 9-11 years at the group level [58]. During the last period development of

school stomatology in the country, but without necessary rates was noted. In this regard, the school age is the most optimum period of carrying out preventive actions from physiological and pathogenic points of view [22, 28].

It should be noted that medical staff exerts supply impacts on the organization of the treatment-and-prophylactic help to the population. So, according to L.F. Timofeev and et al., 2012 in the Republic of Sakha (Yakutia) completeness of dentists of industrial regions (Anabar, Oymyakon, Tompon and Nyurba) averages 55%. At the same time the indicator of hospital beds supply is in limits of digital values of 115 beds on 10000 population. Such situation exerts negative impact on the organization of medical and preventive actions among the population. In this regard improvement of the dental help to the population requires systematic strengthening of material and technical resources and personnel capacity of treatment-and-prophylactic institution in the region.

Accommodation conditions of the population in the North influences on the dental help need. So, according to A.S. Sadulayeva and et al., 2011, patients of senior age group have the high level of prevalence of pathological processes of maxillofacial system and respectively high level of need for the specialized stomatologic help was defined. At the same time it is necessary to develop and introduce the scientifically based recommendations considering specific regional features for optimization of health care.

It is known that caries complications and parodontium illnesses are the main reasons for loss of teeth. At the same time extended defects in the oral cavity cause considerable inconveniences in patients and constantly feel psychological and communicative discomfort [8]. Restoration of tooth defects in patients with orthopedic designs considerably improves quality of life in the next and remote terms [17].

Last researches in the Republic of Sakha (Yakutia) have revealed a high level of caries and parodontium diseases [50, 59]. This situation dictates further researches to reveal and neutralize specific regional biological and environment risk factors of the development of maxilo-mandibular diseases that allows making positive influence on the improvement of dental help to the population.

At the present stage the prevention gains the leading value in health care. It is necessary to improve the prevention of pathological processes of organs and tissues of the oral cavity in the North. Especially this aspect approaches those preventive events which are held with application of fluorinated preparations where it is necessary to regulate together with municipal, regional local governments and their application since preschool and school age [48, 50]. So, according to N. A. Alekseeva (2010), the primary prevention in the conditions of the North with the use of fluoride sodium has allowed decrease in reduction of teeth caries by 43% which is characterized as the priority direction of the prevention of pathological processes of solid tissues of teeth of demineralizing character. But, at the same time, T.E. Yavorskaya (2013) carried out prevention of teeth caries among children of school age with the use of suspension, 2 and 3% of Epsorin solution on the basis of reindeer horns. The suspension was applied in the form of applications within 20 minutes, and solutions in the form of rinsings which have given caries reductions in 51,42, 47,14 and 50,01 respectively that characterized its expressed clinical efficiency in the conditions of deficiency of fluorine in the main sources of drinking water.

It is known that the structure and properties of solid tissues of teeth depending on biogeochemical conditions of accommodation undergoes considerable changes [36]. So, in the Republic of Sakha (Yakutia) year-round water supply is absent in rural settlements when river and lake ice is taken for drinking water in winter which have only fluorides, and extremely low level of mineralization. Such situation definitely creates prerequisites to the development of deficit states and change of mineral exchange in organs and tissues of the oral cavity [4, 50].

Today the main dental help is given in the North by the public treatment-and-prophylactic institutions. At the same time according to A.S. Opravina and others (2015) the main problem of patients is obtaining free dental coupons where chances not to be satisfied by free medical aid are 6,8 times higher in comparison with the commercial clinic. Taking it into account, a network of private clinics should be developed for improvement of the dental help in the North along with the state policlinics.

CONCLUSION

Thus, many local and general factors exert impact on incidence and improvement of the dental help to the population. It, in turn, dictates need of carrying out the researches directed to improvement of quality of the provided medical care taking into account specific regional factors.

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Tyaptirgyanov M.M., Tyaptirgyanova V.M.

QUALITY STANDARD OF THE WATER ENVIRONMENT AND HYDROBIONTS IN THE RIVER VILYUY BASIN

ABSTRACT

There were revealed numerous negative impacts of the diamond industry and Viluiskaya hydroelectric power plant on the aquatic environment and biological objects of the River Viluy basin, expressed to a greater extent in changing of the waters hydrochemical regime and, as its consequence, in violation of the structural and functional nature of the components of aquatic biota; change in the average biomass and abundance of planktonic populations (phyto-and zooplankton) and benthic organisms, and in general - change the flow of energy in an aquatic ecosystem.

Keywords: salinity, gas regime, biogenic element, zooplankton, benthos, the maximum permissible concentration.

INTRODUCTION

In the available scientific literature, there are almost no data on the content and distribution of heavy metals in fish freshwater bodies of the Republic of Sakha (Yakutia). Meanwhile, these studies are important, because fish are bio-indicators of water pollution and an important link in the food chain receipt toxic element in the human body.

Currently toxicosis diagnosis and prognosis of its outcome, are challenging a comprehensive assessment of the status of fish, taking into account the severity of the pathological process, including an assessment of the state of terminative system and the ability to reproduce. At the same time great importance is the differentiation diagnosis of infectious toxics, invasive and nutritional diseases. It should be noted that the fish belongs to the major products of human nutrition and in the assessment of its status the requirements of veterinary-sanitary examination must be taken into account [1,2,3,4,5,6,7,8,9,10,12,13,14,15,16,17].

In the diet of the inhabitants of Yakutia fish products consumption is in fourth place after the meat and dairy products, bread and bakery products. This fact was the basis for the study of the most common systems in the Republic of freshwater fish, and above all the representatives which are not engaged in large migrations and keep the same seats.

Material and methods. The intensity of the environmental situation in the basin of Viluy connected, on the one hand, with the deterioration of the qualitative composition of the water, on the other - with a sharp decline in species diversity of aquatic species and their quantitative indicators, which caused the whole substantial changes in the hierarchical structure of water bodies. From this perspective, we try to find out the main thrust of the changes, the depth of the processes through the following objectives:

- Assess the level of contamination of surface water with toxic substances;
- The study of the dynamics of the species composition of phytoplankton, zooplankton and benthic organisms;
- A preliminary assessment of river water quality for indicator organisms (bioindication) - assessment of the process of accumulation of certain trace elements in water and in biological objects. Chemical analysis of the water was carried out according to generally accepted in the hydrochemistry of freshwaters methods [8].

The results showed that the discharge of saline water from the temporary storage and drainage of polygons has a definite influence on the formation of the hydrochemical regime Irelyakh rivers, M. Botuobuya, Daldyn and Markha. The chemical composition of water is under the direct influence of highly discharges. The greatest changes in salinity is higher than background rates 14 times and amounted to 3.5 MAC. As a result, the chemical composition of the water has changed from bicarbonate-calcium to sodium-chloride.

In the river M. Botuobuya mineralization of water against the backdrop of increased 20 times and amounted to 2.7 MAC. The type of water was mixed. The high salinity of the water after the cessation of discharges, apparently associated with secondary contamination through the soil by salts accumulated in the sediments during low flow. Simultaneously with these processes in rivers increased content of nutrient elements, in particular all forms of nitrogen. In the waters of the riverIrelyakh content of ammonium nitrogen increased 2.5 times against the background, forming in winter 2 MAC, nitrite nitrogen - 10 times (up to 16 MPC); nitrate - in 2 times. The chemical oxygen consumption increased by 2 times. A similar increase in all forms against the background azaota noted at p. M. Botuobuya (ammonium - 3 times, the nitrite - 10, of nitrate - 2, COD - 2 times.

Mineralization of water in the river Daldyn (a group of "Udachniy") at stations located below technogenic discharges was also overpriced (2 times against the background values). A similar situation exists in the estuaries of rivers Daldyn and Markha. By limiting nutrients, in particular on all forms of nitrogen, the excess above the background values of 1.5-2.0 times. Inflated on all these rivers, compared with the background, and turned organic content. In areas exposed to man-made discharges, they turned 2-3 times more in August. Special mention should be noted large concentration of volatile phenols (average r. Daldyn - 8 MAC, the maximum - 19 MAC, while the average background rates - 5 MPC;. in r. Irelyakh - 5 MPC, while the average background - 3 MAC;. in r. M.Botuobuya - 7 MAC, the maximum - 20 MAC, while the average background rates - 2.5 MAC).

The river Viluy - from the village Chernyshevsky till Verkhnevilyuisk major changes in the chemical composition of micro-components were not observed, including the area of human impact. Only on individual stations (p. Bright, S. Syuldyukar, Verkhnevilyuisk) only for nitrates in July there was marked the maximum permissible concentration. However, the content of phenols remains high, at the level of previous years (5 MPC against the backdrop of 2-3 MPC). In the same areas, confined to villages, volatile phenols up to 15 MACs (n Light - 15 MPC;. With Syuldyukar - 10;. N Bordon - 10 MPC;. Verkhnevilyuisk - 8 MPC).

Synchronous changes occur in aquatic biota too. There is a process of continuous lowering of the quantitative development of planktonic organisms (phytoplankton and zooplankton) as a result of many years of dumping of highly mineralized water. Their specific action with respect to individual species. The effect is observed in the ratio of its constituent violation populations up to the loss of certain species, as noted, for example, river Markha, there is not detected early live in her blue-green algae. In the area of high salinity influence - Irelyakh, Tymtyydah, M. Botuobuya, Daldyn, Markha - previously found not marked saltwater species. It also recorded the prevalence of diatoms rheophilic complex.

On the basis of the data revealed that algae growing season adversely affected by the changing seasons and years in hydrological and thermal parameters of the river as a result of the discharge of water from the reservoir Vilyui. Reset mineralized waters from the temporary storage and drainage of polygons has a definite influence on the formation of zooplankton. In winter, the samples taken from the river. Irelyakh, Markha, M. Botuobuya, Daldyn Sytykanskogo from the reservoir, as well as in samples of seepage water processing factory number 9 recorded extremely low abundance and biomass of zooplankton, and in some cases - and their complete absence. In the background the same areas (above the effect of effluent) p. M.Boutobuya noted the presence in samples of zooplankton groups and especially filter feeders. Thus, the following can be cited as comparison. If these contaminated sites zooplankton abundance averaged 40 copies / m3 biomass 1.40 ind / m3, in the background in the spring -.., Respectively - 280 ind / m3 and 1.78 ind / m3... During the summer, indicators were as follows: the number of contaminated sites - 100 copies / m3 biomass 5.1 mg / m3, on background - respectively 450 ind / m3 and 11.56 mg / m3...

Dynamics of changes in the species composition of zooplankton is clearly seen on the example of the river Markha previously surveyed detail LE Komarenko (1962) [11]. Of the 17 previously recorded species of zooplankton in the present time there is only noted 14. Modern composition of zooplankton taxa river includes organisms living in less stained and polluted environment, significant changes have occurred not only in quality but also quantity. Thus, compared to 1958 in 1989 the number of zooplankton groups in the area of the river Markha decreased cladocerans-

from 18500 to 25 ind / m3, copepods -. From 4300 to 35, rotifers - from 60,000 to 175 ind / m3.. It revealed such that where there is no elevated salinity, zooplankton production goes through copepods, and vice versa, in areas with high salinity - in a population of rotifers. In areas of the downstream river. Viluy in the summer is characterized by a slight increase in zooplankton biomass of organisms by adult groups of copepods and cladocerans low quantitative terms. The main reason for the low numbers of these organisms, in addition to the thermal regime is the high content of suspended substances as a result of their accumulation in the water as a result of anthropogenic influences. Reset mineralized water companies adversely affected the diamond industry and representatives of bottom fauna. There is a qualitative and quantitative change in the structure of benthic organisms. So, if in 1958 in the district Viluy was registered 93 taxonomic groups, then in 1989 - only 16. The basis of the recorded species biocenoses were related to cold oxyphilous complex. The most numerous of them were presented eurybiontic species - subfamily ortokladiny chironomids larvae of mayflies, stoneflies and caddis flies. In the most polluted areas (. P Tymtyydah) found larvae of flies - ephedra and their cocoons, usually found only in waters with high salt content.

According to the degree saprobity hydrogeological objects studied water areas can be attributed to relatively clean - the river Viluy and normally soiled - Markha River, below the mouth of the river Daldyn. It should be noted that the classification of water quality is relative and does not give an objective assessment of the full impact of the diamond industry for the following reasons. Firstly, with the September 1988 stopped dumping of highly mineralized water in the river system Viluy career 'Mir' pipe. Secondly, the high volume and long time (since March 1989) discharge of water from the reservoir Vilyui caused erosion and dilution of highly mineralized water and precipitation.

It was revealed that the damming of the river flow, and with it the sharp daily fluctuations of the water level in the downstream lead to significant environmental changes spawning areas and fish to their spawning substrate mismatch, poor water flow, early freezing, etc.). At the same time water release in late June - early July for navigation in the downstream significantly reduce the water level in the reservoir, which often leads to desiccation and death of calves spring spawning fish (pike, perch, etc.), which significantly changes the dynamics their numbers. Long ice period (215-238 days) and the related changes in water temperature regime in the upper and downstream caused a shift in the timing of spawning and its duration at a later date, which negatively affects the whole course of development of the different periods of ontogeny, particularly in its early stages.

The rate of flow is significantly affected by the water level. If the dam part is very high and unstable, the spring flow rate in the middle and lower sections of lower than before (to the regulation), as a result of redistribution of the river flow. There is a low concentration of food items in the dam area of passive demolition and destruction in turbulent water movement. Simultaneously with the upstream dam comes a significant number of dead organic matter (plankton organisms, benthos, juveniles and large fish), who died when passing through hydroelectric turbines that ultimately reduces the oxygen content in the water, especially in ice time and degrades the overall environment aquatic habitat. At the present time, the negative effects of hydraulic works on aquatic biota is aggravated discharge of industrial effluents and the diamond industry with highly mineralized water dump sites. With the development of the diamond industry has increased the introduction of contaminants into the environment, in connection with what was the problem of assessing the level of biological contamination of water environment, the mechanism of their accumulation in organs and tissues of aquatic organisms. The study of the mechanism of accumulation of trace elements in biological objects has been directed by the scheme: water - algae - peaceful fish - predatory fish. Excessive poverty of zooplankton and benthic organisms in the river basin Viluy methodically not allowed to trace the migration of heavy metals through the food chain. In assessing the toxicological water pollution of great importance was attached to the study of algae as the primary producers of oxygen and organic matter in the water, also has extraordinary ability to actively accumulate heavy metals. Studies have revealed a significant accumulation of algae collected from the river Vilyuy basin, nickel and lead (4-7 times), cobalt (2 and 5 times) greater than the background concentration of algae collected in the zone of manmade waste diamond industry (Markha river, MA Botuobuya, Irelyakh).

The findings suggest a possible contamination of water under the influence of anthropogenic factors elements such as nickel and chromium. At the same time, the results obtained allow us to conclude on the need for special studies on the development of MPC for drinking and fishing industry and harmonization of the rules of the MPC for fish production ponds Yakutia.

Conclusion. Revealed numerous negative impacts of the diamond industry and Vilyuiskaya HPP on the aquatic environment and biological objects, that mainly expressed in the change of hydrochemical regime of waters of the basin district Viluy and as its consequence - in violation of the structural and functional nature of the components of aquatic biota; the change in the average biomass and abundance of planktonic populations (phytoplankton and zooplankton) and benthic organisms, fish population; reducing the number of higher taxa; replacing the dominant species in hydrobiocenoses, as well as the emergence of new forms for the ecosystem of aquatic organisms (brackish water); in reducing the number of separate groups, and abundant development of indicator species; in violation of the relations of production processes and the degradation of organic matter; and in general - inthe change of the flow energ in an aquatic ecosystem.

However, studies for many reasons (short duration of the observation period and the period of collecting material, high volume and high water for periods of time, a temporary cessation of dumping waste man-made production, the complexity of differentiating the negative impact of both man-made and altered environmental factor, determining background content trace elements in the environment, their migration and accumulating effects on aquatic biota, etc.) do not allow to do the full objective assessment of the impact of multifactor anthropogenic impacts (Viluiskaya hydroelectric, mining, agriculture, fishing and others.) on aquatic ecosystems Vilyui region's rivers although their negative role is obvious and significant. In order to solve fully tasks it is needed to continue started unique study on the basis of the monitoring, with more in-depth approach to the various levels of the organization, with obligatory coverage of all the major components of the environment.

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SOCIALLY HYGIENIC ASPECTS OF THE QUALITY OF LIFE OF THE PRIMORSKY KRAI POPULATION

ABSTRACT

At the present stage of development, an increasing number of specialists in various areas show an interest in the problems of assessing the level and quality of life of the population. One of the main priorities of socio-economic policy of the state in our days, is to ensure a decent quality of life. The aim of this study was factorial analysis of the main indicators of quality of life of the population of Primorsky Krai. The object of study –the state of the quality of life of the population in Primorsky Krai. Object of research – factors affecting quality of life in Primorsky Krai. The material served as the data of Federal state statistics service (Rosstat). We used the statistical information characterizing the quality of life of the population in Primorsky Krai (demographics, environmental performance, labor, standard of living of the population, housing conditions, education, medical and welfare). As research tools used the method of factor analysis was conducted using the factor analysis module of STATISTICA 10.0, and the application of the analysis ToolPak MS Excel tabular processor. We present the results of information processing, the main indicators of quality of life of the population of Primorsky Krai. It is revealed that the first main component includes nine of the twelve selected characteristics. The main component is described 81,7% of the total variance. The main component is dominated by variables like economic, social, demographic indicators, health indicators, indicators of housing conditions and also an indicator of ecological status. The main component was very important to characterize the quality of life of the population of Primorsky Krai. From obtained results follows that almost all the selected factors have different share of influence on the quality of life of the population, this once again proves the versatility and complexity of the concept of "quality of life". Thus, life quality is a complex characteristics of the conditions of life of the population, which is reflected in objective indices and subjective assessments of satisfaction of material, social and cultural needs connected with people's perception of their position depending on cultural characteristics, system of values and social standards that exist in society.

Keywords: quality of life, population, selection of indicators, factor analysis, evaluation, region, assessment technique, the quality of life indicators.

INTRODUCTION

In recent years in the world the concept "quality of life" is widely used [6,9,11,13,17]. The most important problem of the present stage of social and economic development of Russia is formation of the strong, focused on interests of citizens social policy directed to creation of the conditions providing worthy life and free development of the person, depression of a social inequality, rising of the income of the population, ensuring general availability and the acceptable quality of basic social services [1,2,4,9]. In essence, it is about the solution of a strategic problem - improvement of quality of life of the population of the country.

Important value has that the fact that in the world civilization began new development stage - advance of humanity to the "epoch of quality". Its sense is that quality in all its aspects - economic, social, political, technological - is considered as a necessary condition of providing a sustainable development of a civilization, improvement of habitat, perfecting of the person [11,12,14,15,16]. Management of economy by criterion of quality becomes the key moment of the modern management. The quantitative increase in separate indexes of a standard of living does not solve a problem

today. Criteria which would allow to take into consideration all range of requirements, interests and valuable orientations of citizens are necessary. Quality of life acts as such criterion [1,3,4,6,16].

Heads of the state, representatives of administrations of many regions, mass media speak about quality of life. A number of scientific researches of sociologists, economists, psychologists, physiologists and doctors is devoted to this problem [1,2,3,4,5,7,9,12,15,17]. One of reasons of appearance and wide distribution of term "quality of life" in societies with the high level of consumption there was changing of mechanism of all social development. The criteria of quality of life came into place of especially economic criteria of development, and development of human potential became an aim and factor of the economy growing [6].

In the scientific environment there was no uniform approach to the content of the concept "quality of life", its difference from "standard of living" yet, there is no conventional methodology and a technique of its measurement. Quality of life is considered both as all-sociological and as social and economic and as purely economic concept. One researchers determine him as a level of quality of life, others as the quality of standard of living, third consider that these concepts unconnected and belong to different fields of scientific knowledge. In the scientific literature there is a large variety of approaches to the determination of indices and structures of of lists of indicators from generalized, that cover only the most essential aspects of the life of man, to the multilevel detailed systems, which include the most detailed enumerations of different factors and components. [1,4,5,7,9,10,11,12,15].

All factors which affect on quality of life of citizens are directly or indirectly subdivided on economic, ecological, social, natural, geographical, ideological, historical, cultural and political [6,7].

Thus, from our point of view significant factors, are: demographic condition of the population, education, health care, standard of living (welfare), living conditions, social security (safety, communication, culture and rest), and also ecological situation.

Objective of this research – the factorial analysis of the main indicators of quality of life of the population of Primorsky Krai.

Materials and methods. Data of Federal State Statistics Service served as material (Rosstat). In work the statistical information characterizing quality of life of the population in Primorsky Krai was used (demographic indexes, indexes of ecology, work, a standard of living of the population, living conditions, educations, medical and social security). Processing statistical information was accomplished with the application of a packet of the analysis of the tabular processor MS Excel and Statistika 10.0 with the use of a module of factor analysis [8].

The characteristic of the factors affecting on quality of life of the population in Primorsky Krai.

Primorsky Krai is characterized by natural and migratory decline in population. For period from 2013 to 2014 the quantity of population diminished on 8.8 thousand persons, in 2014 a quantity made 1938,5 thousand persons. Reduction of number happened as at the expense of natural losses – 24.6%, and because of migratory outflow – 75.4%. In general for 2004-2014 Primorsky Krai due to the negative values in demographic reproduction process lost about 5% of resident population, the decrease in population which began in 1991 continues still. In Primorye at present is observed the depopulation, at which takes place natural and migratory decline in population at the same time (fig. 1).

Laws of reproduction: birth rate, survival and mortality — lead both to restructuring of the population, and to change of total number. Let's note the main tendencies in the course of reproduction, the characteristic of Primorsky Krai. The analysis of birth-rate in Primorye is characterized next tendencies: number of born on 1000 persons in 2014 increased on 23% as compared to 2005 (from 10.4 to 12.8);*ƒ* total birth rate (average of the children born by one woman for all her life) in 2013 was1.7; the dynamics of the values of the total birth rate, necessary for guaranteeing the simple reproduction of population, on the average composes 2,14, which exceeds statistical total birth rate on the seaside edge to 20.5% and tells about the insufficient level of birth rate, although it has insignificant tendency toward an increase.

Education. Education is one of the major factors of development of the person allowing the person to be guided in the changing social and economic situation. In modern Russia education remains that sphere, in that a country can compete with the industrially developed countries and pursue an independent policy answering the requirements of developing economy. The modern Russian education system is multistage, open, and covers practically all age sectors of society. With transition to the market of paid services, including in the field of education, the network of private educational institutions is intensively formed.

In recent years in the region in general the steady tendency of reduction of a network of preschool educational institutions is observed. As of the end of 2008 functioned 517 establishments on 65,4 thousand places. Mainly it happened because of sharp demographic recession in last years. But at the same time the number of children in preschool educational institutions has an apparent tendency of increase, in comparison with 2005 increase happened for 24,2% that became the real problem, especially for the regional center for this reason the last several years are actively realized the program for construction and reconstruction of child care preschool educational institutions, from 2008 to 2015 the city administration of Vladivostok for the purpose of the organization of shared and free preschool education created 7 500 places for children of preschool age. The city administration of Vladivostok continues the work on expansion of a network of the preschool educational organizations within implementation of the subprogramme "Development of system of preschool education" of the municipal program "Development of Education of the City of Vladivostok" for 2014 - 2018. And today all children at the age of three years are also more senior are provided with places in kindergartens.

With secondary education stabler situation. With secondary education there is more stable situation. Here is a not considerable decline of quantity of students, and unchanging number of the state middle special educational establishments. And here with students it is impossible to call a situation stable though if to compare the number of students in 2000 and in 2013, the situation remains almost invariable, 34789 and 30700 people respectively that is besides bound to the demographic recession which began in the 90th years. The same situation is observed also in system of higher education (fig. 2).

Thus, in an education system we see rather stable tendencies, except for preschool educational institutions. Although quantity of student in all educational establishments is reduced, explain this is possible by the decline of total population.

Living conditions. The need for the dwelling falls into to number of primary vital needs of the person. The dwelling is included in system of public and consumer services of the population, makes the habitat of the person defining quality of life of the population. In the conditions of market economy the dwelling acts as durable goods. Being expensive goods, the dwelling is one of the most important factors of inducing of savings of the population, formation of investment resources. Security of the population with housing is one of characteristics of quality of life of the population.

In Primorsky Krai for 2013 the total area of the premises falling on one inhabitant made 19,8 sq.m that is 1,5% less than previous year, and in thirteen years increase happened for 13,5%, but despite these indicators, the housing problem of the population still remains sharp.

Medical support of the population. The medical support of the population means preservation of its health. In turn, health of the population is complex hygienic and the socio-economic index reflecting a level of development and the organizations of medical care. Health of the population - the necessary objective prerequisite for satisfaction of the material and spiritual needs of the population. And to keep the level of a medical support worthy enough doctors and medical personnel is necessary for an upkeep of the population.

The number of doctors of all specialties in Primorsky Krai in general tends decrease. Also every year the number of medical institutions decreases, in eight years their number decreased by 42,4%. But, without looking, at above-mentioned indicators, the power of medical out-patient and polyclinic establishments increased, it is bound to

restructuring of a network of medical institutions, their integration, opening of the modern versatile healthcare institutions.

Standard of living of the population. One of the significant indexes which are most representatively characterizing a standard of living of the population is its monetary income. As the main indicator of a standard of living, the income of the population are a source of satisfaction of personal needs of the population in consumer goods and services. From the other side, profits determine demand for the consumer goods in the sphere of consumptive use, and through this they influence the process of production, proposal of new goods and services, what is in turn the moving factor of economic development.

Monetary income of the population of Primorsky Krai in 2014 made 28339,6 rubles per capita, and increased in comparison with previous year by 16,3%, and in five years increase happened almost twice. In 2009 this index made 15486 rubles. For the most part of the population the main source of tools are the labor income and pensions. For the last five years the average size of pensions in Primorsky Krai increased by 2,2 times from 4 599,6 rubles in 2008 to 10224,4 rubles in 2013 respectively, and for the last year increase made 9,6%, at the same time the rate of inflation in 2013 made 6,5%.

The integrated assessment of quality of life with the use of factor analysis. Under a factor analysis understand totality of methods that on the basis of really existent connections of features (or objects) which make it possible to reveal the latent generalizing characteristics organizational structures also of the mechanism of the development of the studied phenomena and processes. [6]. The factor analysis does not demand division of signs on dependent and independent (it more approaches studying of quality of life of the population as in this phenomenon there is no unique indicator), in it all signs are considered as equal. The purpose of factor analysis is updating of initial information, expressing a large number of the considered signs through smaller number of internal characteristics of the phenomena, i.e. there is as if "compression" of information.

For the analysis we selected the factors influencing quality of life of the population of Primorsky Krai. Such factors, in our opinion, are: demographic condition of the population, education, health care, standard of living (welfare), living conditions, social security (safety, communication, culture, rest and ecological situation (tab. 1).

The analysis of the main indexes of quality of life of the population of Primorsky Krai showed the following. One main component was defined, and the first main component includes nine of the chosen twelve signs. Besides, the main component describes 81,7% of the common dispersion. Thus, the main component was very significant for the characteristic of quality of life of the population of Primorsky Krai (tab. 2). Two factors from our selection (unemployment rate on methodology of the ILO and the expected life expectancy), have low factor loadings therefore for the further analysis we do not use them. Let's range factor loadings of this component and we will define what indexes of category exert the greatest impact on a standard of living of the population. Factor loading shows, contents which describes a factor is how expressed in this variable (actually the sign of factor loadings is only mathematical and does not bear in itself object estimator therefore when ranging it is not considered, and as a matter of convenience estimates of influence of each factor the contribution of each factor as a percentage was calculated. Apparently from table 2, in the main component prevail as variables of economic, and social character, demographic indexes, indexes of health of the population, indexes of living conditions and also an index of an ecological state. Follows from the received results that practically all chosen factors have a different share of influence on quality of life of the population, it once again proves all versatility and complexity of concept of "quality of life".

In the conclusion it is possible to tell that quality of life is a complex characteristic of conditions of activity of the population which is expressed in objective indexes and value judgment of satisfaction of the material, social and cultural requirements and it is bound to perception people of the situation depending on cultural features, system of the values and social standards existing in society.

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SOME FEATURES OF THE FUNCTIONAL STATE OF ORGANS AND TISSUES OF ORAL CAVITY AMONG THE INDUSTRIAL AREAS POPULATION OF SAKHA REPUBLIC (YAKUTIA)

ABSTRACT

Complex of clinical and laboratory dental research of industrial areas population of North-East of Russia was conducted. Severe climatic conditions of the population have a negative impact on the functional state of organs and tissues of oral cavity. So, the biophysical properties of oral fluid changes due to reduction of salivary flow rate were revealed with a predominance of second and third type of microcrystallization, increasing of saliva viscosity, a decreasing of calcium and phosphorus concentration, and also decreasing of alkaline phosphatase activity and remineralizing potential of oral fluid. These changes at influence of aggressive factors of external and internal environment can create the preconditions for the emergence and development of major dental diseases. Besides this we conducted x-ray spectral microanalysis, investigation of microhardness and hard tissue density of intact teeth of school age children identified certain changes characterizing quantitative and qualitative changes in their composition and properties. Herewith violations of the structural hard tissue homogeneity of intact teeth with changes in calcium and phosphorus index and the presence of enamel micro- and macrocracks were established, in case of cariogenic situation they can contribute the development of pathological processes of teeth hard tissues of demineralizing character. Identified specific regional risk factors of dental diseases cause a high prevalence and intensity of pathological processes of organs and tissues of oral cavity. In key age groups of 12 years old children and 35-44 years old adults we determined high level of dental caries intensity, and a high prevalence of pathological processes of periodontal tissues of inflammatory-destructive character among 15years old teens. The revealed changes of functional status of organs and tissues of oral cavity among different age groups of industrial areas population of Yakutia are specific regional risk factors for the formation and development of dental diseases.

Described above dictates the necessity of development and implementation of complex program of dental diseases prevention in practical health care of the region and improvement of medical aid to the industrial provinces population of Sakha Republic (Yakutia), taking into consideration the revealed changes of composition and properties of oral fluid and hard tissue of intact teeth.

Keywords: Density, structural homogeneity, microhardness of hard tissue of intact teeth, viscosity, microcrystallization of oral fluid, salivary flow rate, dental caries, periodontal disease.

At this time one of the priorities of the government is socio-economic development of regions and the country in whole [5,6]. Regarding this, special attention is given to strengthening and preserving of population health [2, 11]. The living conditions of population in the North leave a negative impact on the functional status of organs and tissues of oral cavity [2, 3, 4, 7, 8, 10]. The investigations aimed at specific regional risk factors for the formation and developments of dental diseases are actual.

It should be noted that the improvement of dental care to the population based on knowledge of clinical and epidemiological features of disease and biological and environmental factors determining the frequency and severity of pathological processes [1, 9, 12]. Similar studies in the industrial provinces of Yakutia were not evaluated, which determines their theoretical and practical significance in dentistry.

Purpose of research. On the basis of comprehensive dental studies to identify biological risk factors of dental diseases formation and development.

MATERIALS AND METHODS

Clinical and epidemiological investigation of 1,580 people aged 3 to 44 years residing in the industrial uluses (districts) (Tomponsky, Oymyakonsky, Nyurbinsky, Anabarsky) of Sakha Republic (Yakutia) was conducted. Thus, in accordance with the classification there were formed following key age groups: 3, 6, 12, 15, 35-44 years old. Assessment of dental status was performed using standard indexes and criteria. Standard card recommended by WHO (1997) was used for the survey. The study of the susceptibility of the hard tissues of the tooth by caries was conducted on the prevalence and intensity of dental caries. During the examination of the group we determined the arithmetic mean value. The periodontal status was determined on the basis of performance of communal periodontal index CPI (1995).

The composition and properties of oral fluid was determined in terms of saliva flaw rate, the viscosity of oral fluid using viscometer VC-4 according to the method of Zimkin N. I. and his co-authors (1955), the types of microcrystallization by the method of P. A. Leus (1977) (n=420), calcium and alkaline phosphatase content, acid-base balance on photocolorimetry-5010 (Germany) (n=229), cationic-anionic mixed saliva electrophoresis carried out in the apparatus of capillary electrophoresis system "Capel-104T" (Russia) (n=178).

We assessed the biophysical properties and composition of hard tissue of intact teeth removed for orthodontic indications. There were studied 88 sections of incisors, canines, premolars and molars. Contact and lateral surfaces, vestibular and oral sides and tops of cheek, oral bumps, fissures of the chewing surfaces, contact front and rear surfaces, buccal and oral sides of premolars and molars were studied.

The study of microhardness of hard dental tissues was carried out according to the method of Vickers, regulated by GOST 2999-75. The hardness was measured at loads from 9.8 N (1 kgf) and 980 N (100 kgf) in "DIGITAL MIKROINDENTATION TESTER LM -700" apparatus (Japan). The evaluation was carried out with the measurement at least of 3 points, and then arithmetic mean value was calculated. The study was conducted at the Department of solid state physics of Physical-technical Institute of North-Eastern Federal University named after M. K. Ammosov.

Method for determining the density of hard tissue of intact teeth and hydrostatic weighing regulated by GOST 25281-82 (ST SEV 2287-80) was carried out in the measuring scales VLTE-500 (Russia). Determination of the density of hard tissue of intact teeth was carried out by measuring the linear dimensions of samples and hydrostatic weighing.

The study of the structural homogeneity of inner layers of the enamel and teeth dentin was carried out using the method of x-ray energy-dispersive microanalysis with nonstandard detector with combined device XL 20 (Philips), scanning electron microscope, x-ray microprobe with dispersion energy (Scott V. D., Love G., 1983). Photomicrographs obtained in the secondary electron mode and quantitative analysis was conducted by nonstandard method for obtaining a much larger amount of reliable experimental data.

Statistical processing of clinical material was carried out using standard techniques of variational statistics with calculation of average value, root mean square error using the software packages "Microsoft Excel" 2007 (Microsoft Corporation, 1985-1999). Obtained results were grouped together according to similar characteristics. The critical level of significance while testing of statistical hypotheses is $p \leq 0.05$.

RESULTS AND DISCUSSION

Analysis of the results indicates a high level of prevalence and intensity of dental caries among different age groups. In the age groups of 3 to 6 years old children, the prevalence of caries of deciduous teeth ranged from 37,21±0.63 to 100%. At this age there is a marked increase of KP index, where 3 years old children have the intensity of 2.31±0,06, 7.26± 0,07 for years old. Caries intensity lesions in permanent teeth of 6years old children was at the level of 1.94±0,08, where there are removed first molars of the lower jaw about complications of dental caries (0,79±0,19). In the key age group of 12 years old children prevalence of caries is defined as 100%, where the intensity of dental caries in this group of children is interpreted as high (6,45±0,07). The same situation on the prevalence of dental caries is determined by the 15-year-old children (100%) when the average intensity level of 8.48+0,23. In the age group 35-44 years with 100% prevalence of the severity of carious, sealed and extracted teeth is of 19.72+0,21,

which characterizes a very high level of intensities of tooth decay. At the same time, in the age group of 65-74 years the average intensity of dental caries was 25,60±0,26.

The prevalence of periodontal diseases indicates a its high level, where the rates ranged from 88,89±0.11 to 98,31±0,38%. While in the age group of 65 and older there is a decrease in prevalence (61,43+0,42) that is associated with the logical processes associated with tooth loss. **In** the intensity of destruction of periodontal tissues with age increase in frequency of unrecorded sextants and pathological periodontal pockets, which indicate the severity of periodontal diseases, mainly inflammatory-destructive character.

The high prevalence of dental diseases among the examined groups of people was the basis of the evaluation of organs and tissues the properties of oral cavity, with the aim of identifying risk factors.

The evaluation of the biophysical properties of oral fluid of the examined age groups characterizes the availability of some features. Thus, salivary flaw rate in the preschool and school age (3, 6 and 12 years old) ranged from 0.29±0.04 to 0,33±0,07 ml/min. While for 15 years old teens the rate was 0,35±0,09 ml/min (the optimal value of secretion rate among children of 0.40 ml/min). For 35-44 years adults, mixed salivary flaw rate separation was in the range of values of 0.47±0.08 ml/min (the optimal value of the rate of secretion for adults is 0,70 ml/min.). Evaluation of the data shows the reduction in the rate of saliva secretion in the examined age groups.

It should be noted that in such properties of mixed saliva as viscosity and types of microcrystallization certain changes that characterize an unfavorable background were observed. Viscosity value of oral fluid of the examined age groups shown its increase, where it ranged from 2,89±0,04 to 3.30 0,04±0,02 units (the optimal rate of 4,16 units). The predominance of the II and III types is determined in the structure of microcrystallization, where their average results were within the numerical values 39,88±1.33 and 47,47±1,17%. Despite the detected changes in the properties of oral fluid of patients, the average pH was within the optimal values (6.77±0,03).

Data analysis of alkaline phosphatase activity in saliva characterizes its reduction, where the rates ranged from 22.70±1,64 to 38.60±of 2.56 u/l (optimal value of 54-114 u/l at pH 7.0 and above).

It is known that quantitative and qualitative changes in the composition of oral fluid in a certain way have an impact on the level and frequency of incidence. Thus, the maximum values of cations were determined in kalium, where the rates ranged from 6,36±0,19 to 7,87 0,19±0,11 mg/l. Further concentration of sodium and ammonium, which average indicators from 3,22+of 0.10 to 6.5±0,26 mg/l. Low concentrations were observed in lithium, magnesium, strontium, barium, which ranged from 0,012±0,02 to 0.95±0.01 mg/l. In the anionic composition of oral fluid data, the concentrations of chloride, nitrite, fluoride, sulphate and nitrate ranged from 0,006+0,005 to 3.21+0.22 mg/L.

It should be noted that the concentration of ionized calcium in oral fluid is considerably 1.94 times lower than inorganic phosphate. Such changes to some extent have a negative impact on mineralizing action of saliva in the examined groups and the peculiarities of composition and properties of oral fluid in combination with other cariogenic factors can contribute to the formation and development of dental diseases.

Spectral microanalysis, characterizing the saturation of hard dental tissues by micro - and macroelements indicate some of their features, their weight ratio and the atomic mass ratio. In the structure of weight ratio indicators calcium and phosphorus play a significant role, which ranged 40,42-41,42 and 18.22-18.64%. The data of fluorine and sodium concentration were within the numerical values of 0.99-1.82 and 0.86-2.31%. Meanwhile, the results obtained by the weight ratio of calcium and phosphorus characterize violations of enamel structural homogeneity of intact teeth among children of school age, as evidenced by calcium-phosphorus molar ratio index, where it was 1.93 (optimal value of 1.67). In this case the average ratios of atomic masses of calcium and phosphorus made up a significant part, and it was 95.48%, where the proportion of calcium was 54,61% and the second component was 40.87%.

Data analysis of hardness of dental tissues measurement by Vickers method characterizes the presence of numeric values variations. In such areas as, the enamel of chewing surfaces of molars and premolars, tooth hardness reached maximum levels and it ranged from 964,3 to 1952,7 N (kgs), the value of enamel surface in the cervical area

reached 305,1 and 548,2 N (kgf). Data of hardness of root dentine and near the apex ranged from 294,7 to 467,8 N (kgf) and from 217,1 to 404,9 N (kgf).

Data of the mass of tissue sections from oral surfaces of intact premolars and molars was obtained in conducting research on measurement method of hydrostatic weighing of hard tissue of intact teeth, where the rate was 0.18 m/g. data Evaluation linear measurements did not reveal the presence of features. Thus, density value of the investigated sections with oral and vestibular surfaces varied from 1,79 to 2.25 g/cm3. Average value was not much different.

From the above analysis it can be seen that the indicators of the biophysical properties of intact enamel of kids and teens permanent teeth have violations of the structural ratio of calcium and phosphorus content, they contribute to the reduction of resistance of teeth hard tissues to aggressive factors of external and internal environment. The microphotography revealed the presence of micro- and macrocracks on the surface of tooth enamel.

CONCLUSION

Peculiar properties of composition and properties of oral fluid and hard tissue of intact teeth in the form salivary flow rate reducing, a predominance of second and third types of microcrystallization, increase of viscosity, decrease of activity of alkaline phosphatase and concentration of calcium, phosphorus in oral fluid, as well as a violation of the structural homogeneity and the ratio of calcium and phosphorus in the hard tissues of intact teeth are specific biological risk factors of dental diseases among the population of industrial regions of Sakha Republic (Yakutia). These facts dictate the need for a comprehensive program of prevention of dental caries and periodontal diseases aimed at its negative impact neutralization or reduction.

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Ethnic, gender and age differences between the prevalence of risk factors and progression of cerebrovascular disease in elderly and senile individuals with chronic cerebral ischemia

ABSTRACT

The authors have made comparative analysis of the prevalence of risk factors of cerebrovascular disease in elderly and senile persons living in the Republic Sakha (Yakutia) and suffering chronic ischemia of the brain depending on ethnicity, age and gender. It is shown that from these criteria ethnicity has great importance in the development of hypertension, atherosclerosis, coronary heart disease, diabetes and alcoholism.

Keywords: ethnicity, elderly and senile age, gender, Republic Sakha (Yakutia).

Many epidemiological studies established the risk factors for cerebrovascular disease [6,10,14,16,17,18,19,23,24,25].

According to modern concepts, risk factors are potential health hazards of behavioral, biological, ecological, genetic and social features of the environment, which increase the likelihood of developing the disease, its progression and poor outcome [11].

According to modern concepts, cerebral vascular disease, which is an important medical and social problem, have a multifactorial nature and depend on heredity [18].

Statistical reports on mortality, as well as epidemiological studies, have revealed differences in the incidence of cardiovascular disease and related deaths in different countries, and showed the importance of ethnic and racial identity. [12] Specific therapeutic and preventive measures in some regions suggest assessing the impact of various risk factors in the development of cerebrovascular diseases, while also accounting for geographical and ethnic aspects [5].

Major risk factors for cardiovascular disease, which we revealed in the Yakuts and other Siberian populations, differ from those of other groups, who were also in transition from traditional way of life and diet [1,4].

It is known, that hypertension and atherosclerosis are significant factors of morbidity, which reduces the average life expectancy [13]. As the main cause of cerebrovascular disease, these conditions [3] have largest share in mortality and disability [8, 9], and at the same time, there are significant differences in the prevalence of these conditions in different regions of Russia [7, 15, 21], but the reasons for its development and features of target organ damage in the northerners are not well understood [20,22].

Statistical processing of the results of the study were carried out using SPSS 19.0 package applications. The average value with standard deviation for qualitative data were calculated. Qualitative features are presented in the form of frequency tables containing absolute and relative values of feature fraction (percent). Accordance to the laws of the distribution of quantitative traits to meet the normal distribution we performed using the Kolmogorov-Smirnov test. The results showed that the distribution of the investigated parameters differed significantly from the normal distribution. Considering it, we performed further statistical analysis using non-parametric tests. For comparison of the mean values of the studied parameters we used Mann-Whitney paired test.

To study the conjugation of qualitative features we calculated Pearson's classic chi-square, and in cases where the expected rate in more than 20% of contingency tables cells was less than 5, we calculated Pearson's chi-square corrected by Yates continuity.

The threshold level of significance for all statistical tests was p value <0. 05.

MATERIALS AND METHODS

The study included 522 patients with chronic cerebral ischemia (CCI) with I and II stages.

We used the diagnostic criteria for CCI developed by Institute of Neurology of the Russian Academy of Medical Sciences (1985), the formulation of diagnosis was made according to the International Classification of Diseases, 10th edition. Based on the goals and objectives of this study all patients were divided into 3 groups, according to the region of residence and nationality. According to the classification E.V. Schmidt (1985), each group was further divided into subgroups depending on the stage of CCI. Subgroup A included patients with CCI stage I, and subgroup B - patients with CCI stage II (CCI I and CCI II).

Group I consisted of 174 patients of Even (indigenous population of Arctic region) nationality (subgroup A and B each consisted of 87 people) living in the Arctic zone. Group II included 177 patients of Yakut nationality (subgroup A - 90 patients, subgroup B - 87) living in Vilyuisky zone. Group III consisted of 171 patients of Russian nationality (subgroup A - 86 patients, subgroup B - 85) living in the city of Yakutsk. These areas are not identical in their environmental and ecological features, and inhabitants are different in the way of life, especially food, employment and the level of civilization.

Arctic zone is inhabited by small-numbered peoples of the North – the Evens, Evenks, Chukchi, Yukagirs. This area is more environmentally mild. The inhabitants of this region have predominantly consume traditional food, including meat and fish, rich in unsaturated fatty acids, vitamins and mineral components, and a variety of plants.

Studies conducted by E.G. Egorov and V.R. Darbasov (the Institute of Regional Economy of the North) (2008) together with the specialists from the Institute of Nutrition (Russian Academy of Medical Sciences), revealed the high content of polyunsaturated fatty acids omega-3, omega-6 and vitamin E in the meat of young Yakut breed horse, cattle and deer, which has cholesterol-lowering effect.

In Vilyui region, home to the indigenous population - the Yakuts, in recent years gained rapid development of the diamond mining industry. The ecological balance of this region was disturbed, with irreversible changes in the environment, which negatively affected people's health. Vilyuy Dam and chemical pollutants that are used for industrial processing components of diamondiferous kimberlite consisting of aluminum silicates, calcium-manganese and iron-containing rocks, oxides of titanium, chromium, nickel, magnesium and others, significantly worsened the water quality of Vilyuy river. Multiple excess of maximum permissible concentration (MPC) of organic substances: phenol - 2-7 times higher, oil products - 4 times, nickel - 4-7 times, copper and zinc - 2 times, aluminum and manganese - 20 times, chromium, lead, iron - 7 times higher or more was found (P.G. Petrova, 2005). Analysis of the research carried out by laboratories of the Institute of Applied Ecology of the North (Academy of Sciences of Sakha (Yakutia) Republic) (2005) revealed the excess number of MPCs in the soil too.

RESULTS AND DISCUSSION

Based on the objectives of the study, risk factors of the onset and progression of cerebrovascular disease in each group was studied (Table 1).

An analysis of risk factors showed that hypertension is a leading factor in the development and progression of CCI, and occupies a leading position among all subgroups, with a statistical significance rate significantly lower in group I patients. It is well known that atherosclerosis is a major cause of premature aging, disability and mortality in older people. Dyslipidemia in our study is the second largest risk factor and often occurs with high statistical significance among representatives of Group III. Heart disease prevailed in the subgroup A in Russian - 45.1% vs 25.5% and 29.4% of patients groups I and II, and in the subgroup B Yakuts - 38% vs 26.8% and 35.2% of the patients I and III groups. However, a comparison of the results in the subgroup B had no statistical significance. Obesity, one of the risk factors, was more common in the "newcomers" in both subgroups.

However, the observed differences in subgroup B were not statistically significant. In the subgroup A of diabetes mellitus (DM) was more common in representatives of group III. In the subgroup B DM was more common in III, then II groups, and almost never found in group I, the representatives of indigenous population of the North, who has maintained a long tradition of food, which almost never included sugar. Family history of DM was observed more frequently in patients of Group II in both subgroups, increase in patients of group II in subgroup B were not statistically significant. Analysis of the socio-cultural factors indicates a high prevalence of smoking and alcohol abuse among patients in both subgroups of Group I. However, the predominance of northerners in subgroup B was not statistically significant. It is believed that smoking leads to a more rapid development of early atherosclerosis and the formation of hemodynamically significant stenoses of the extracranial arteries (318). Smoking was more prevalent in subgroup A in 54.1% vs 32.4% and 13.5% representatives II and III groups in a subgroup of B in 55.6% vs 28.9% and 15.6% respectively.

The distribution of risk factors by age group is shown in Table 2. As can be seen from the table, all the risk factors, in addition to coronary heart disease, found in both subgroups in the elderly. Heart disease in the subgroup B was dominated by the representatives of old age. Apparently, this is due to the predominance of "young" patients in our study.

Comparative analysis of risk factors for cerebrovascular disease according to age, as shown in Table 6, with the evaluation of χ^2 criteria shows statistical relationship between age and arterial hypertension (χ^2=7,473, p=0.0024), dyslipidemia (χ^2=7,473, p=0.006) , coronary heart disease (χ^2=7,473, p=0.018), obesity (χ^2=7.473, p<0.008), DM (x^2=7.473, p<0.004). Thus, the greater the age, the more pronounced these risk factors.

Non-modifiable risk factor - heredity - is more common in more "young" patients and is independent of age (χ^2=0,473, p=0,45). Perhaps it is because a person with a family history of cardiovascular system and cerebrovascular diseases, do not live to old age. Analysis of the socio-cultural factors also did not reveal connection between age and harmful factors (smoking χ^2=0,570, p=0.45 and alcohol χ^2=0,254, p=0.614).

Thus, the risk factors associated with age, the distribution of major risk factors also depend on age. Highest correlation of risk factors was found in ethnicity: hypertension (χ^2=8,066, p=0.018), coronary heart disease (χ^2=4,504, p=0.034), obesity (χ^2=6,398, p=0.041), dyslipidemia (χ^2=38,867, p=0.000), diabetes mellitus (χ^2 =14,214, p=0.001), alcohols (χ^2=16,982, p=0.000), smoking (χ^2=13,126, p=0.001), and heredity is not related to ethnic group (χ^2=5,319 p=0.070). However, when you consider the stage of CCI, with the worsening of chronic cerebrovascular insufficiency, an association between heredity and CCI was (χ^2=6,268, p=0.044). Of interest is the distribution of risk factors associated with the development of the disease, depending on the gender.

The analysis of gender-sensitive features, regardless of the ethnicity, showed a high frequency of occurrence with statistical significance (p<0.05) in women with coronary heart disease (57.2% vs. 42.8% of men, χ^2=5,928, p=0.015), obesity (72.6% vs. 27.4%, respectively, χ^2=5,215, p=0.022), diabetes (60% vs. 40% respectively), and alcoholism in men (74% vs. 26% of females, x^2 = 17.897, p=0.000). The rest of the gender differences risk of occurrence were unreliable, which included arterial hypertension (52.8% women and 47.2% in men, p>0.05) and harmful risk factors - smoking (56.1% women and 43.9% men, p>0.05) and family history of cerebrovascular disease (80% in females and 20 males, p>0.05).

With the worsening of the CCI stage the frequency of risk factors of cerebrovascular disease in patients with this pathology increases. This is evidenced by a comparative analysis of risk factors, depending on the stage of cerebrovascular disease of this disease with the use of the Mantel-Hentzel criterion of conditional independence. Thus, as can be seen from Table 3, the chance of transition from the first to the second stage, is very high in patients with hypertension, dyslipidemia, coronary heart disease. Obesity, diabetes, bad habits and heredity do not depend on the severity of CCI.

An interesting fact is that the distribution pattern on the number of risk factors, depending on gender, ethnicity, age is as follows: one woman has an average of 2.0 risk factors, male - 2.04, Even - 1.69; Yakut -2.06; Russian - 2.28, senior - 2.04 and elderly - 1.97.

CONCLUSIONS

Thus, in our study, we concluded that a CCI is mainly result of factors such as atherosclerosis and hypertension.

Each ethnic group has its own unique risk factors. The high incidence of coronary heart disease and hypertension in the Russians may be attributed to poor adaptability of the organism to the harsh climatic conditions of Yakutia. The high incidence of cardiovascular diseases among the Yakuts may be associated with urbanization and the departure from the traditional way of life.

And behavioral risk factors such as alcohol and smoking have been found in the Evens, the indigenous population of the North, which may indicate a lack of explanatory and preventive activities.

Family history of cardiovascular disease was recorded mainly in the Yakuts. In addition, it traces the relationship of the main risk factors with age. The analysis of conjugation showed that gender identity influenced as well at the prevalence of major risk factors.

Table 1.

Indicators of risk factors for cerebrovascular disease in groups and subgroups of observations

Comparison groups		CCI stage I				CCI stage II			
		I	II	III	Total	I	II	III	Total
Hypertension	n	47*	52*	57*	156	62	63	73*	198
	%	30,1	33,3	36,5	100	31,3	31,8	36,9*	100
CHD	n	13	15	23*	51	19	27	25	71
	%	25,5	29,4	45,1*	100	26,8	38,0	35,2	100
Obesity	n	14	17	25*	56	20	21	27	68
	%	25,0	30,4	44,6*	100	29,4	30,9	39,7	100
Dyslipidemia	n	12*	45*	49*	106	36*	66*	68*	170
	%	11,3*	42,5*	46,2*	100	21,2*	38,8*	40,0*	100
DM	n	2	2	10*	14	2*	8	11*	21
	%	14,3	14,3	71,4*	100	9,5*	38,1	52,4*	100
Alcohol	n	7	5	0	12	11*	3	1*	15
	%	58,3	41,7	0,0	100	73,3*	20,0	6,7*	100
Smoking	n	20*	12	5	37	25*	13	7*	45
	%	54,1*	32,4	13,5*	100	55,6*	28,9	15,6*	100
Heredity	n	1*	8	5	14	4	8	4	16
	%	7,1*	57,1	35,7	100	25,0	50,0	25,0	100

Note: in the Tabl. 1 and 2 asterix is $p<0.05$, at the analysis of contingency pairwise comparisons with Bonferroni correction frequencies, $p>0.05$ in the remainder

CHD – coronary heart disease, DM – diabetes mellitus

Table 2.

Distribution of cerebrovascular disease risk factors by age

Comparison groups		Hypertension		CHD		Obesity		Dyslipidemia		DM		Alcohol		Smoking		Heredity	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
CCI I	60-74	93	59,6	26	51	42*	75*	67	63,2	12*	85,7*	8	66,7	20	54,1	8	57,1
	75-89	63	40,4	25	49	14*	25*	39	36,8	2*	14,3*	4	33,3	17	45,9	6	42,9
	Total	156	100	51	100	56*	100*	106	100	14	100	12	100	37	100	14	100
CCI II	60-74	105	53,0	33	46,5	45*	66,2*	97	57,1	13	61,9	8	53,3	23	51,1	13*	81,3*
	75-89	93	47,0	38	53,5	23*	33,8*	73	42,9	8	38,1	7	46,7	22	48,9	3*	18,8*
	Total	198	100	71	100	68*	100*	170	100	21	100	15	100	45	100	16	100

Table 3.

Mantel-Hanzel criterion in CCI

Risk factor	M-H	Likelihood ratio	Odds ratio	X^2	*p*
Hypertension	16,740	17,722	1,526-3,279	17,549	0,000
CHD	4,249	4,704	1,042-2,305	4,688	0,03
Dyslipidemia	32,537	33,990	1,982-4,034	3,609	0,000
Obesity	1,508	-	0,878-1,972	1,774	1,83
DM	1,201	-	0,78-3,158	1,618	2,03
Smoking	0,84	-	0,8-2,062	1,077	0,2
Alcohol	0,19	-	0,59-2,803	1,402	0,52
Heredity	0,053	-	0,559-2,451	0,776	0,675

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Measures of state support of pharmacy organizations in the Arctic zone

ABSTRACT

The article characterizes the spatial aspects of the availability of drug supply for the population. The factors that shape the development of the pharmaceutical service in the Arctic regions of the Sakha Republic (Yakutia) were considered. The Arctic areas are defined in accordance with the decree of the President of the Russian Federation. The availability of pharmaceutical care in Arctic regions was analyzed in comparison to more densely populated and economically prosperous municipalities of the Republic. Possible solutions to existing problems are proposed.

Keywords: drug provision, the range of medicines, the pharmaceutical security experts, Arctic regions, municipal pharmacies.

In the "Basics of state policy of the Russian Federation in the Arctic for the period till 2020 and for a further perspective" the Arctic is seen as the Arctic region, including water Arctic basin, marginal seas with Islands and adjoining parts of the mainland [3]. For the Republic of Sakha (Yakutia) this area is a narrow coastal strip.

In accordance with the presidential decree №296 "On the land territories of the Arctic zone of the Russian Federation" dated on 2 may 2014 the Arctic zone of the Russian Federation includes the 5 districts of the Republic of Sakha (Yakutia): Anabarsky, Allaikhovsky, Bulunsky, Nizhnekolymsky and Ust-Yansky districts. Arctic areas of the Republic occupy the coastal part of the Arctic ocean. The total area is 593,9 thousand square kilometers (table 1).

Table 1.

The composition of territories of the Arctic zone of the Sakha Republic (Yakutia).[4]

№ п/п	Municipal formation	The population of people on 01.01.2014	Area	
			thousand sq. kilometers	in % to total area
	The Republic Of Sakha (Yakutia)	**954803**	**3083,5**	
	The Arctic zone of Sakha (Yakutia):	**26447**	**593,9**	**19,26%**
1	Allaikhovskiy district (Chokurdak)	2764	107,3	3,5
2	Anabar district (Saskylah)	3403	55,6	1,8
3	Bulunsky district (Tiksi)	8507	223,6	7,3
4	Nizhnekolymsky district (Chersky)	4414	87,1	2,8
5	Ust-yanskiy district Deputy	7359	120,3	3,9

The Republic of Sakha (Yakutia) is one of the few regions of Russia, which preserved the natural increase of the population (table 2). In 2013 compared to 2012, the rate of natural increase increased for 3,5% and amounted to 8.8 ppm.

The figure for the country is significantly higher than the average figures of Russia and the Far Eastern Federal District. The level of natural increase of the population the Republic takes the 8th place along with Tyumen oblast in the Russian Federation behind the Chechen Republic, Republic Ingushetia, Republic of Tyva, the Republic of Dagestan, Yamalo-Nenets Autonomous district, Khanty-Mansi Autonomous district and the Republic of Altai, and the 1st place among the regions of the far Eastern Federal district [1].

Table 2

The natural movement of population (per 1000 population)

Municipal districts	fertility			mortality			natural population growth			The number of births per 1 death case		
	22013	22012	22011	22013	22012	22011	22013	22012	22011	22013	22012	22011
Allaikhovskiy	117,1	117,3	118,1	117,8	114,5	115,8	--0,7	22,8	22,3	11,0	11,2	11,1
Anabarskyi	223,2	118,8	119,7	88,5	99,4	111,0	114,7	99,4	88,7	22,7	22,0	11,8
Bulunskyi	115,9	115,6	117,0	99,1	110,0	112,4	66,8	55,6	44,6	11,7	11,6	11,4
Nizhnekolymsky	118,5	116,7	117,0	114,4	112,2	113,9	44,1	44,5	33,1	11,3	11,4	11,2
Ust-yanskiy	116,6	116,5	119,7	114,6	114,3	115,6	22,0	22,2	44,1	11,1	11,2	11,3
Yakutsk	116,7	118,2	116,7	77,1	77,4	77,3	99,6	110,8	99,4	22,4	22,5	22,3
The Republic Sakha (Yakutia)	**117,5**	**117,8**	**117,1**	**88,7**	**99,3**	**99,4**	**88,8**	**88,5**	**77,7**	**22,0**	**11,9**	**11,8**
city population	115,5	116,6	115,6	88,4	99,2	99,2	77,1	77,4	66,4	11,8	11,8	11,7
the rural population	221,1	119,9	119,9	99,3	99,7	99,8	111,8	110,2	110,1	22,3	22,1	22,0
Russian Federation	**113,2**	**113,3**	**112,6**	**113,0**	**113,3**	**113,5**	**00,2**	**0**	**--0,9**	**1,0**	**11,0**	**00,9**
The Far Eastern Federal district	**113,9**	**114,0**	**113,2**	**112,6**	**113,1**	**113,5**	**11,3**	**00,9**	**--0,3**	**11,1**	**11,1**	**11,0**

The fertility rate in the Arctic regions of the Republic is 18.26 per 1000 population, at the average, which is generally higher than rate in the Republic, but lower than the average for the rural population of the Republic. The mortality rate in Arctic regions of the Republic is 12,88 per 1000 population, which is significantly higher than the

national average among urban and among rural population. This figure is also higher than figure of the Far Eastern Federal district. Natural population growth can be observed in all Arctic regions except Allaikhovskiy district.

The main causes of mortality in the Arctic, as well as in the Republic, are diseases of the circulatory system, external causes and cancer. There are 28 medical organizations (MO) in the Arctic. The system of providing inpatient and outpatient care is represented with 5 hospitals, 1 medical clinic, 11 district hospitals, 11 of the PLL.

Provision of round-the-clock beds in areas of the Arctic (2013 - 125,3; 2012 - 127,3; 2011 - 124,6) exceeds the average numbers for the Republic (2013 - 106,9; 2012 - 106,9; 2011 - 107,6;) by 17% on average. Indicator of the availability of round-the-clock beds is higher than the average value (2013 - 106,9) in the following Arctic and Northern uluses (districts): Ust-yanskiy (171,8 per 10 thousand population), Nizhnekolymsky (170,6 per 10 thousand population), Allaikhovskiy (132,9 on 10 thousand of population.

196,25 units are provided as total number of doctors in MO, 97 people are working as individuals, i.e. staffing is 49,42%. The number of doctors in the whole Arctic regions is below the national average by 30% and is 36,67 per 10 thousand population of the Republic of Sakha (Yakutia).

The purpose of this research is a study of problematic issues of organization of medicine provision in 5 Arctic regions of the Sakha Republic (Yakutia).

The availability of the medicinal help to the population generally is not only a sufficient number of pharmacies, but it is also the number of inhabitants per pharmacy, the level of availability of pharmaceutical professionals and other factors. These figures in different municipalities within one country are quite different.

Social development of municipal formations of the Arctic zone of the Russian Federation in the status of municipal areas and city districts depends on a number of key factors: demographic, social, financial, managerial, environmental, criminal, etc [2].

To characterize the necessary conditions for the development of the system of pharmaceutical care, we used the underlying indicators of socio-economic development:

- the number of population;
- the number of economically active population;
- employment percentage of number of economically active population;
- natural growth of population;
- population density;

These figures clearly reflect the specificity of the territorial socio-economic development of the Arctic regions.

The districts of the Republic were divided into 3 groups on the basis of existing methods of ranking municipalities in terms of socio-economic development:

Group 1 – municipalities with high level of socio-economic development with relatively favorable social and demographic situation;

Group 2 – municipalities with an average level of socio-economic development, which are characterized by stable development of socio-economic spheres;

Group 3 – municipalities with a low level of socio-economic development;

To develop options for state support of pharmaceutical activity, we conducted a comparative analysis of the number of pharmaceutical organizations and experts in the Arctic regions of the Republic with other districts of the Republic what are more prosperous in terms of socio-economic development.

For this purpose indicators of socio - economic development of the Arctic regions were compared with the indicators of two municipal districts: the Mirny and Megino-Kangalassky districts of the Republic of Sakha (Yakutia) (fig.1, 2). The Mirny district is a municipality in the West of Yakutia. It is one of the most industrialized districts of the Republic. The main branch of the economy is the mining industry. In the area of Mirny, Ihalo-Udachny mining and Srednebotuobinskoye nodes that specializes on the extraction of diamonds, oil, natural gas. The diamond mining fields of the district is 14% of world production. The area was nominally assigned to 1 group.

Megino-Kangalassky district is a municipality in Central Yakutia. It is one of the most populous agricultural districts of the Republic. The main branch of economy is agriculture, namely the livestock (dairy cattle, beef herd horse breeding). Cereals, potatoes, vegetables and fodder crops are also cultivated here. The area was assigned to 2 group.

As seen in figures 1 and 2, population, economically active population, natural population growth and the density of accommodation have a distinct negative trend in the Arctic group of districts of the Republic of compared to areas in the Central and Western parts of the Republic. These indicators form a common trend of functioning and development of pharmaceutical services in the Arctic. Since 1990, the population of the Arctic regions of the Republic declined by more than 2 times, and migration loss increased 1.5 times. Today the population of 5 Arctic regions of the Republic is 26.4 thousand people or 2.76 % of the total population of the Republic. In the Arctic regions there's almost no regular logistics between the settlements and the administrative center. The worst transport provision is observed in the Ust-Yana district, where more than half of the population is unable to reach the district center.

4 drugstores, 2 pharmacy branches operate in 5 Arctic regions. In the Anabar area pharmacy organizations are absent. Pharmaceutical care is provided only by municipal pharmacies in the territories of Arctic regions, there are almost no pharmacies of private ownership. Private capital is represented only in the Ust-Yanskiy district in the form of two pharmacies. The average supply of pharmacists per 10 thousand population is 1.46 people, pharmacists per 10 thousand population is 3.22 people. Pharmaceutical care in settlements where there are no pharmacies medical assistants is the FAP-s and health workers in district hospitals. Analysis of the present stage of development of the pharmaceutical service in the Arctic regions of the Republic showed that there are significant differences on such indicators as the number of inhabitants on one pharmacy organization and provision of pharmaceutical personnel per 10 thousand of population in the municipalities of the Republic of Sakha (Yakutia).

As can be seen from figure 3, in the Arctic regions one pharmacy organization serves an average of 4407 inhabitants, in the Mirny district 1181 inhabitants, in Megino-Kangalassky district – 2675 inhabitants.

Indicator of the availability of pharmaceutical specialists with higher and secondary education per 10 thousand of population of the Republic of Sakha (Yakutia) in the Arctic is significantly lower than not only in the two compared regions, but in average in the Republic

For analysis of the factors that have the greatest impact on the state of pharmaceutical care in the municipalities of the Republic of Sakha (Yakutia) we selected sociological method, focused on the collection of direct and indirect opinions of specialists with pharmaceutical education. The survey was conducted among pharmaceutical specialists of the Republic, trained in certification courses.

To achieve the objectives, we compiled questionnaire of 30 questions. The questions were divided into the following sections:

- demographic profile (gender, age, place of residence – in the countryside or in the city);
- professional status of the specialist (education, work experience, position, work experience);
- the organizational structure of the pharmacy;
- description of the maintenance contingent, including a profile, the capacity of hospitals.
- the presence of small retail network;
- the presence of activity on manufacture of medicines;
- identification and evaluation of factors that have the greatest impact on the state of pharmaceutical care in the country.

60 specialists with pharmaceutical education joined the survey, which is approximately more than 5% of specialists in the Republic. The absolute number of respondents were women. The share of specialists with pharmaceutical education at the age from 30 to 45 years old accounted for 14.3 per cent, from 45 to 55 years old - 53,6%, from 55 to 60 years – 28,6%, over 60 years old is 3.5%. 80% of respondents have work experience more than 20 years. Higher pharmaceutical education have 34 specialist or 56.7%, the highest 26 specialist -43,3%. 35.7% of experts work in the city pharmacies, 64,3% of specialists work in rural areas.

To assess the factors basic indicators were selected, that affect, in our opinion, the state of pharmaceutical care in the country. Pharmaceutical professionals were asked to rate their importance on a ten-system, with 10 points was estimated to be the most important factor according to respondents, the factor that has least impact was estimated at 1 point. Specialists in pharmaceutical education could additionally include important according to them the factors in the ongoing evaluation.

The selected factors were divided into 5 blocks. The first block consisted of factors characterizing the demographics of the territory (district): population, density of population residence, natural increase of the population. The second block included the following factors: the number of economically active population, the employment rate, the number of economically active population. The third block consisted of factors characterizing the transport accessibility of the territory (area): distance from the center of the Republic, the structure of the transport scheme in the district, the regularity of the transport message on a seasonally adjusted basis. The fourth block consisted of two factors: the number of doctors and number of hospital beds hospitals. In the fifth unit respondents were asked to name and evaluate other significant factors according to respondents.

Table 3

Evaluation of factors influencing the availability of pharmaceutical care to the population of the Arctic areas

Factors affecting the state medical assistance	**The answers of experts with pharmaceutical education in %**									
	1 1point	2 2 points	3 3 points	4 4 points	5 5 points	6 6 points	7 7 points	8 8 points	9 9 points	9 10 points
number of population	-	-	33,3	88,4	113,4	66,6	118,4	223,3	118,4	88,2
Natural population growth	-	-	33,3	110,0	110,0	116,7	118,4	118,4	220,0	-
The density of living population	-	66,7	111,6	118,3	116,7	225,0	116,7	55,0	-	-
The number of economically active population	-	-	33,3	33,3	111,7	110,0	116,6	115,0	118,3	221,8
The percentage of employment the number of economically active population	33,3	33,3	55,0	115,0	110,0	116,7	118,4	220,0	88,3	-
The distance from the center (capital) of the Republic of	-	-	-	-	-	88,3	110,0	220,0	225,0	336,7
Complex transport scheme in the district	-	-	-	-	66,7	66,7	111,8	223,4	330,0	221,4

The regularity of transport, and dependence on the seasonality of transport	-	-	-	-	-	113,4	111,8	223,4	330,0	221,4
The number of doctors	-	-	-	-	-	115,0	330,0	226,7	225,0	33,3
The number of bed Fund of medical institutions	-	-	-	110,0	118,4	220,0	116,6	226,7	88,3	-
Other factors	-	-	-	33,4	55,0	110,0	221,6	220,0	223,3	116,7

As it can be seen from Table 3, 3.3% of respondents cited the factor "percentage of employment the number of economically active population" as the least important factor.

The greatest influence on the state of pharmaceutical care in the Republic of Sakha (Yakutia), according to respondents, are: "the distance from the center of the Republic" – named by 36% of respondents, "the complex transport scheme in the district" – named by 21,4% of respondents, "regularity of transport, and dependence on the seasonality of transport" with 21.4%. These factors by total points, estimated by respondents in 9 and 8 points, have a leading position.

In the study it was found that government support in the first place, should be aimed at minimizing the negative impact of the above factors.

In this regard, in order to provide priority air transport of medicinal products and medical devices to municipal entities of the Republic a joint order of the Ministry of health of the Republic of Sakha (Yakutia) and the Ministry of transport and road facilities of the Sakha Republic (Yakutia) was prepared and implemented, defining principle of the priority of transportation of drugs. The reimbursement of transportation costs for the delivery of vital and essential drugs in the Arctic and Northern regions of the Sakha Republic (Yakutia) was developed in the form of grants to legal entities and individual entrepreneurs.

The procedure defines the purpose and conditions of granting from the state budget of the Republic of Sakha (Yakutia) funds for the reimbursement of transport costs for the delivery of essential drugs in Arctic and Northern regions of the Republic.

The purpose of granting subsidies from the state budget is to ensure that medicinal maintenance of the population living in the Arctic and the Northern group of districts of the Republic. A condition of granting of a subsidy is the importation of essential drugs in the Arctic and Northern areas according to the following criteria:

- definition of an authorized operator in accordance to current legislation of the Russian Federation;

- presence of an authorized operator license for pharmaceutical activity in the following types: "Wholesale of pharmaceuticals and medical products, Retail trade of pharmaceutical goods";

- presence of the authorized operator, of contracts for transportation, processing and handling;

- availability of storage facilities for the storage of essential drugs;

- documents proving transport costs on delivery of essential drugs in Arctic and Northern regions including costs for transport, processing, loading and unloading operations.

Thus, the proposed measures of state support in the form of reimbursement of transportation costs for the delivery of medicines in the Arctic and Northern regions of the Republic will allow to increase availability of medicinal assistance to the population and to develop motivation and incentive methods for conducting pharmaceutical activities in these areas.

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Fig. 1. The population, economically active population, employment of the economically active population on average in the Arctic regions of the Republic and in Megino-Kangalassky and Mirny areas of the Republic

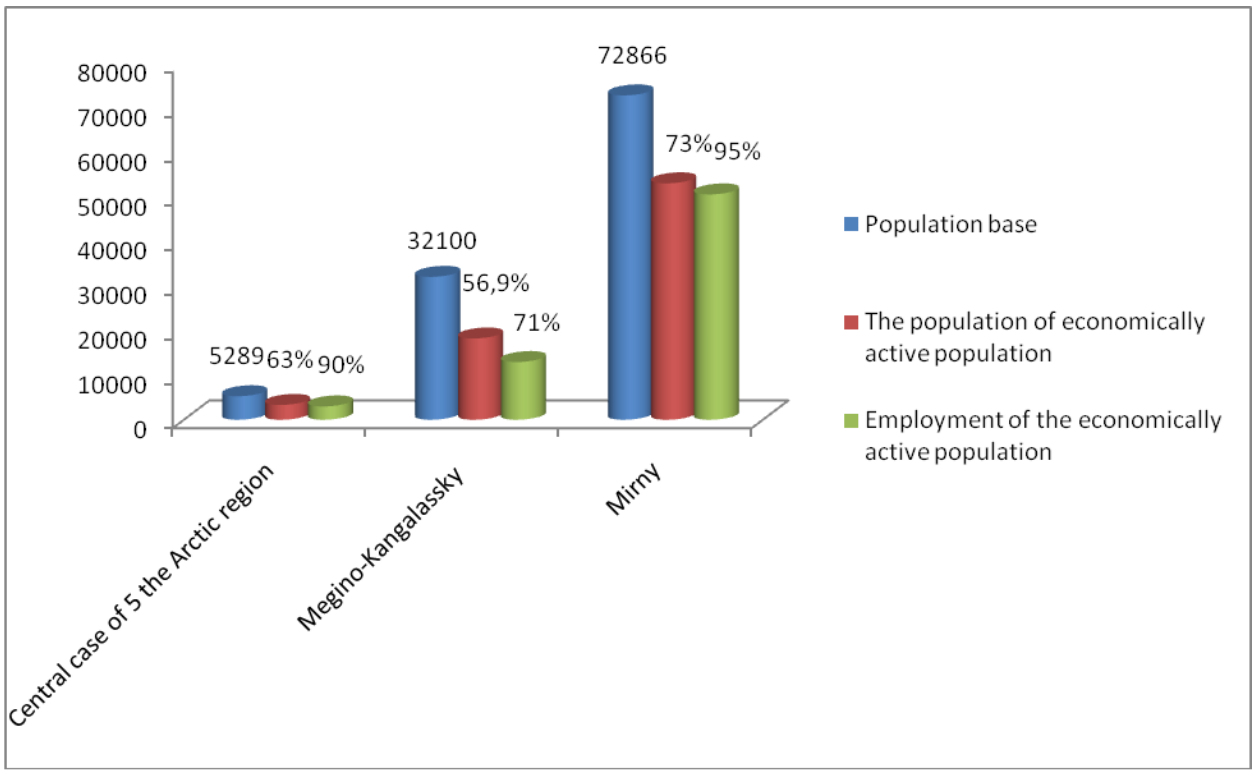


Fig. 2. The population, natural increase and density of residence (km2)

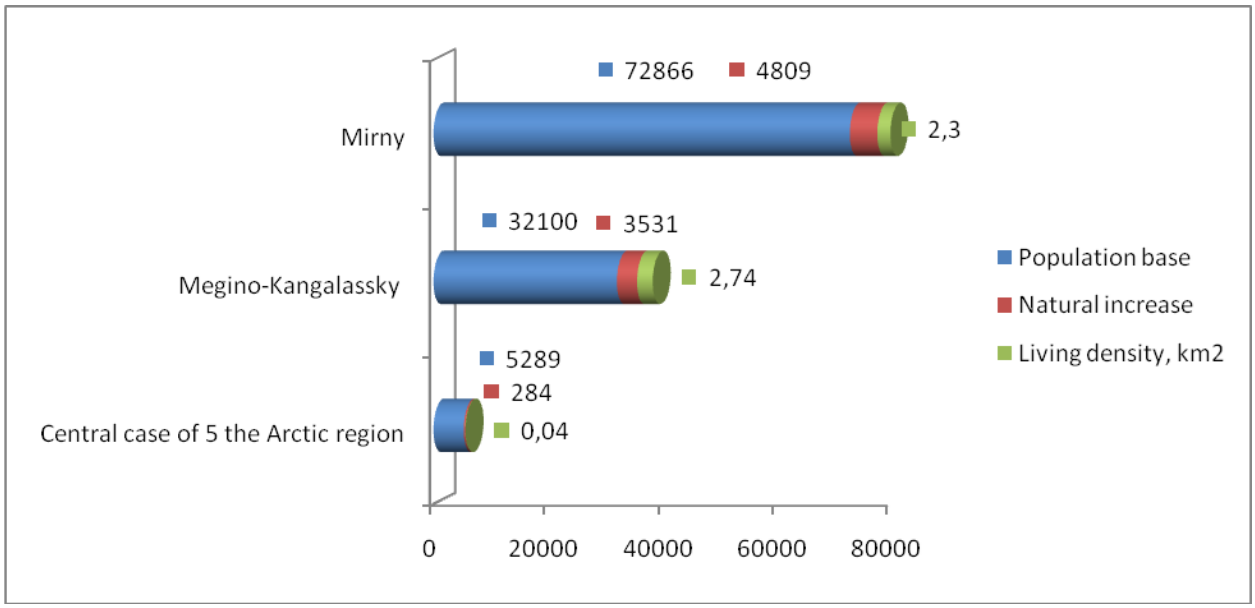


Fig. 3.The number of inhabitants on one pharmacy organization an average of 5 Arctic regions and compare the 2 areas

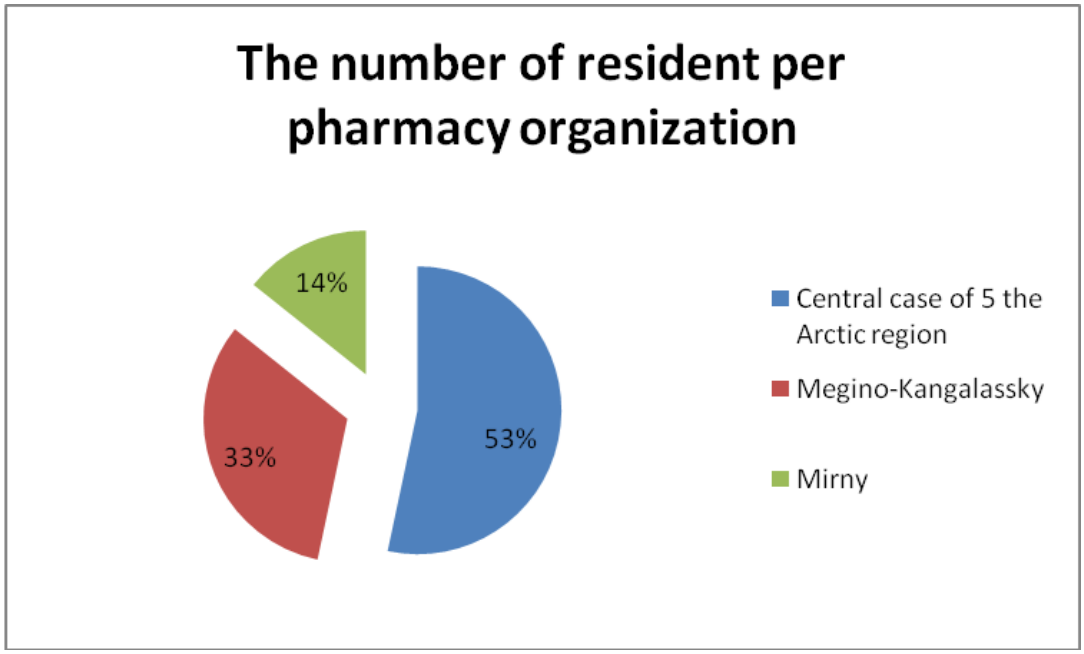
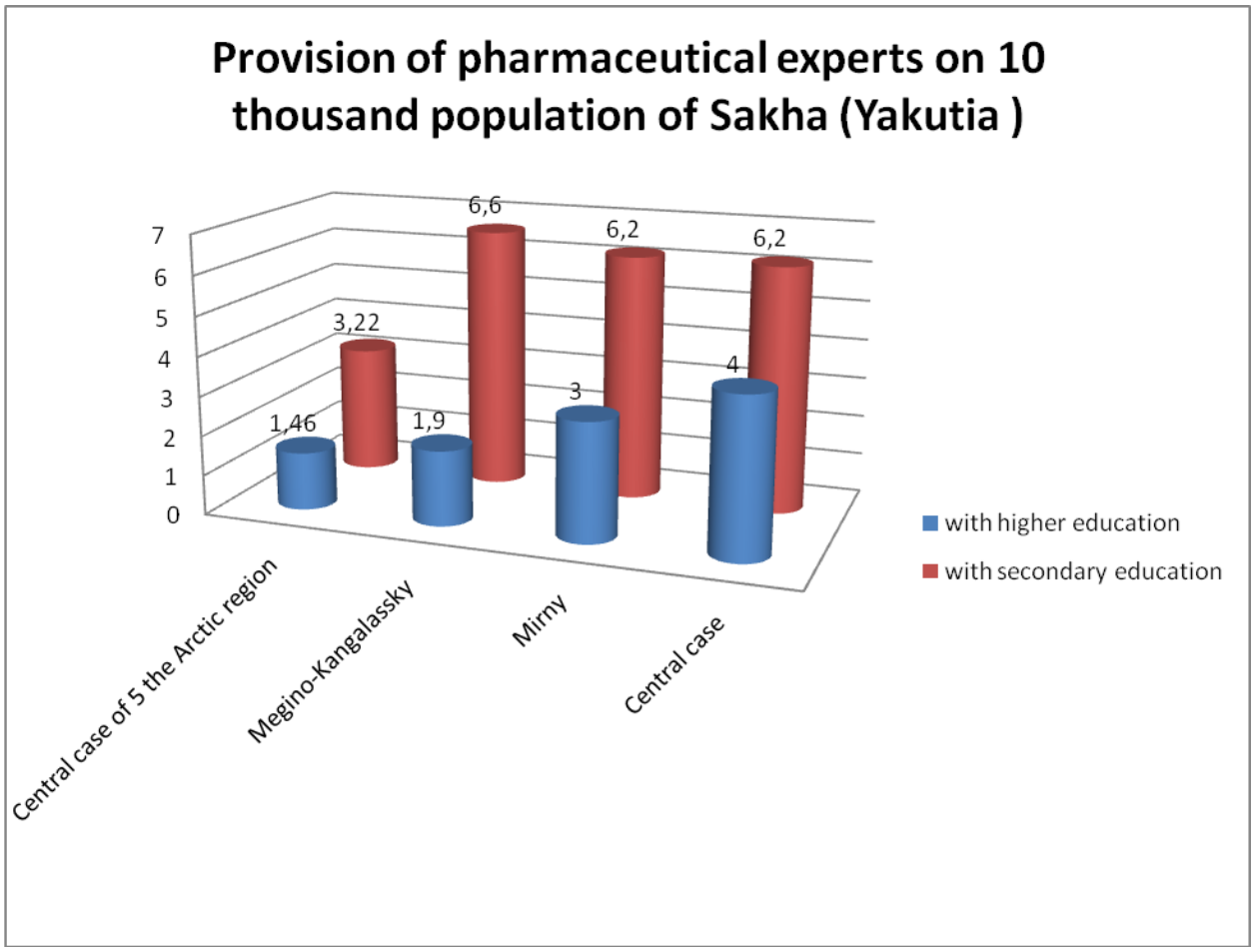


Fig.4. Pharmaceutical Security experts on 10 thousand of population of the Republic of Sakha (Yakutia)



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COMPARATIVE ANALYSIS OF THE MORTALITY MAIN CAUSES AMONG THE WOKING AGE IN THE REPUBLIC OF SAKHA (YAKUTIA): ETHNICITY DIFFERENCES

ABSTRACT

The comparative analysis of the mortality leading causes among the working age population in Republic Sakha (Yakutia) depending on ethnicity is presented in article. In the structure of mortality for period of 2005-2011 external causes were at the first place, the second – cardiovascular diseases and at the third one – malignant tumors. Ethnic differences were characterized by the fact that the non-natives died from the cardiovascular diseases, including the acute myocardial infarction, and malignant tumors, more often than the natives. In the non-natives the mortality from alcoholic cardiomyopathy and casual poisoning and exposure to alcohol was higher. Mortality from the external causes was higher among indigenous small in number people of the North than among the Yakuts and the non-natives. In the Yakuts in comparison with indigenous small in number peoples of the North the mortality from cardiovascular diseases and cerebrovascular accidents was higher.

Keywords: Yakutia, mortality, working age, population ethnic differences.

INTRODUCTION

In the Republic of Sakha (Yakutia), as well as in the whole of Russia, depopulation is one of the most actual problems. In Russia has one of the lowest life expectancy in comparison with developed countries of the world and countries, the level of economic development which is close to the Russian. Low life expectancy is formed mainly due to high mortality in the working age [1]. In recent years, both in Russia and in Yakutia marked positive shifts in the demographic development, characterized by stable fertility rates, overall mortality, and natural population growth. Life expectancy of the republic population in 2005 has increased by 5.13 years and in 2014 was 69.81 years (for men – 64.34 yr, an increase of 5.68 yr; for women – 75.50 yr, an increase of 3.96 yr) [2]. According to the Federal State Statistics Service of the Russian Federation the life expectancy in 2014 was 70.93 years (since 2005, an increase of 4.56 yr) (for men – 65.29 yr, an increase of 6.37 yr; for women – 76,47 yr, 4 years length) [3].

According to the National Population Census in 2010 in the structure of the working age population of the Republic of Sakha (Yakutia) non-native population was 48.7%, Yakuts – 47.3%, indigenous small in number peoples of the North – 3.9%. Compared with census in 2002, the total number of the Yakutian working age population increased by 1.7% (10,384 people). At the same time, the number of the working-age non-native population decreased by 8.6% (28,223 people), Yakuts increased by 12.8% (33033 people) and indigenous small in number peoples (ISNP) of the North – by 30% (5574 people) (Fig. 1).

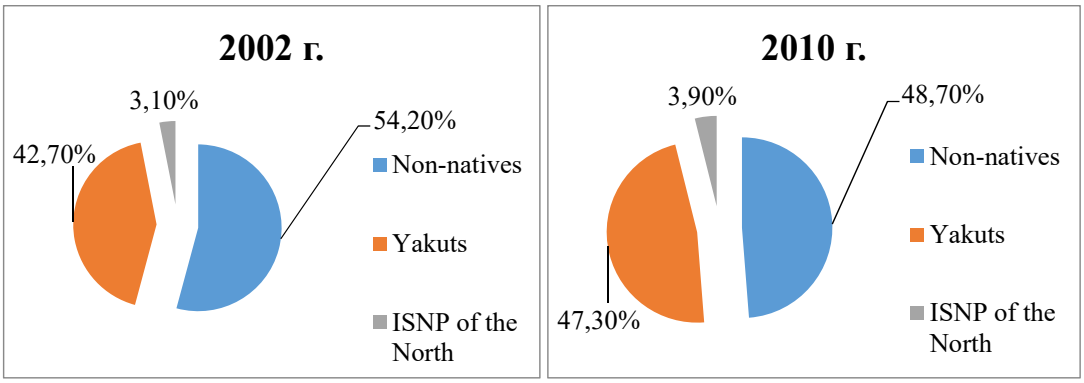

Fig. 1. The proportion of the Yakutian working age population in national groups according to the National Population Census in 2002 and 2010

Despite some improvement in health and demographic indicators in the country, of the working age population mortality rate of remain high, which may cause in the future labor shortages, especially among men.

Objective: The comparative analysis of the mortality leading causes among the working age population in Republic of Sakha (Yakutia) for the period of 2005-2011.

MATERIAL AND METHODS

The analysis of the all working-age population mortality in the Republic of Sakha (Yakutia) for 2005-2011 according to the Yakut republican medical information-analytical center was held. Total 31001 the case of working-age persons death we analyzed. For comparative analysis were used age-standardized mortality rates for the age group 15-64 years. To calculate of the mortality rates by ethnicity were used census data of the working age population in 2002 and 2010. Were calculated the mortality rates in accordance with the International Classification of Diseases 10th revision (ICD-10) by primary of the death main causes: cardiovascular diseases (I00-I99), external causes of morbidity and mortality (V01-Y98) and malignant tumors (C00- C97). The statistical processing of data been conducted with the program «Statistica 6".

RESULTS AND DISCUSSION

In the Russian Federation and the Far Eastern Federal District (FEFD) in the structure of the working age population mortality causes, since 2008, the first place was occupied by cardiovascular diseases, the second place – external causes (accidents, injury, poisoning, suicide), who led in the previous years and the third – malignant tumors. At the same time in the period under review in the Republic of Sakha (Yakutia) in the first place was mortality from external causes, except for 2010, the second place was occupied by death from cardiovascular diseases, and the third – by malignant tumors (Table 1).

Table 1

The mortality rate of the working population by mortality main causes in the Republic of Sakha (Yakutia) (RS(Y)), Far Eastern Federal District (FEFD) and Russian Federation (RF) (on 1000 working-age population)

Cause of mortality		Years						
		2005	2006	2007	2008	2009	2010	2011
Cardiovascular diseases (I00-I99)	**RS (Y)**	2,64	2,34	2,20	2,35	2,40	2,60	2,31
	FEFD	3,27	2,92	2,63	2,71	2,52	2,72	2,50
	RF	2,63	2,36	2,16	2,17	2,01	2,01	1,89
Of them ischemic heart disease (I20-I25)	**RS (Y)**	0,78	0,67	0,60	0,69	0,66	0,56	0,61
	FEFD	1,58	1,42	1,29	1,34	1,29	1,29	1,18
	RF	1,27	1,13	1,05	1,06	0,98	0,97	0,88
Including acute myocardial infarction (I21)	**RS (Y)**	0,21	0,17	0,19	0,16	0,17	0,16	0,24
	FEFD	0,35	0,35	0,34	0,32	0,32	0,31	0,30
	RF	0,16	0,16	0,16	0,16	0,16	0,15	0,15
Cerebrovascular diseases (I60-I69)	**RS (Y)**	0,58	0,53	0,45	0,46	0,44	0,43	0,42
	FEFD	0,67	0,60	0,52	0,51	0,48	0,50	0,45
	RF	0,56	0,52	0,50	0,51	0,49	0,50	0,34
External causes of morbidity and mortality (V01-Y98)	**RS (Y)**	2,92	2,77	2,61	2,71	2,53	2,53	2,40
	FEFD	3,39	2,97	2,71	2,69	2,39	2,49	2,43
	RF	2,69	2,40	2,21	2,07	1,89	1,82	1,67
Of them deliberate self-harm (suicide) (X60-X84)	**RS (Y)**	0,67	0,66	0,65	0,67	0,65	0,56	0,56
	FEFD	0,53	0,51	0,50	0,49	0,46	0,43	0,40
	RF	0,40	0,37	0,36	0,33	0,33	0,30	0,26
Accidental poisoning by and exposure to alcohol (X45)	**RS (Y)**	0,14	0,10	0,05	0,07	0,09	0,10	0,08
	FEFD	0,35	0,25	0,17	0,17	0,15	0,16	0,14
	RF	0,37	0,29	0,23	0,22	0,19	0,17	0,15
Traffic accidents (V01-V99)	**RS (Y)**	0,28	0,31	0,19	0,20	0,21	0,20	0,27
	FEFD	0,36	0,29	0,35	0,32	0,23	0,28	0,32
	RF	0,34	0,22	0,34	0,31	0,27	0,25	0,27
Malignant tumors (C00-C97)	**RS (Y)**	0,76	0,70	0,75	0,69	0,75	0,64	0,66
	FEFD	0,96	0,94	0,94	0,91	0,89	0,91	0,90
	RF	0,88	0,87	0,87	0,87	0,86	0,85	0,85

During the analyzed period in the Republic of Sakha (Yakutia), the coefficient of the working-age population total mortality declined steadily up to 2009. Thus, in 2008 the figure was 7.07 per 1000 population, which is lower than the figure in 2005 by 8.8%. Then, starting in 2009, the mortality rate from all causes had a tendency to grow, and in 2011 increased by 5.9% as compared with 2008 (Table 2). A comparative analysis of the mortality dynamics by ethnicity the following differences are revealed. Dynamics of the total mortality among non-natives was similar to the Republican: in 2008 compared to 2005, the coefficient of the total mortality decreased by 12.9%, then in the following years, this figure has increased significantly and peaked in 2011 (an increase by 25.4% compared to 2008). Among the indigenous small in number peoples of the North the opposite is true: until 2009, the mortality rate increased (in 2008 increased by 22.9% compared to 2005) and then decreased by 34.1% in the following years. Yakuts noted steady decline in overall mortality and for the analyzed period has decreased by 23.9%. Ethnicity differences in dynamics of mortality can be

explained by of the working age population changes: a reverse exodus non-native population and an increase in the number of indigenous people. In analyzed period the dynamics of the mortality from cardiovascular diseases, external causes and malignant tumors among native people of Yakutia tended to a steady decline, among the non-natives the mortality rate from external causes and malignant tumors was increased.

Table 2

The main causes of the working age population mortality in the Republic of Sakha (Yakutia) by ethnic groups for the period 2005-2011

(1000 working age population by ethnic group of persons)

Ethnic groups	Years						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Coefficient of the total mortality							
Yakuts	7,17	6,42	6,92	6,75	6,04	5,38	5,46
ISNP of the North	8,97	9,18	9,56	11,02	8,26	6,89	7,26
Non-natives	8,14	7,61	7,18	7,09	8,12	9,24	9,51
RS (Y)	**7,75**	**7,15**	**7,14**	**7,07**	**7,24**	**7,32**	**7,51**
including mortality from cardiovascular diseases (I00-I99)							
Yakuts	2,14	1,79	1,90	2,04	1,86	1,81	1,81
ISNP of the North	2,43	2,54	2,32	2,38	1,78	1,99	1,37
Non-natives	3,02	2,72	2,52	2,94	2,83	3,53	2,95
RS (Y)	**2,63**	**2,32**	**2,25**	**2,54**	**2,39**	**2,65**	**2,23**
malignant tumors (C00-C97)							
Yakuts	0,63	0,57	0,67	0,61	0,70	0,44	0,47
ISNP of the North	0,49	0,54	0,65	0,86	0,81	0,42	0,58
Non-natives	0,89	0,86	0,99	0,81	0,90	1,03	1,11
RS (Y)	**0,77**	**0,72**	**0,84**	**0,73**	**0,81**	**0,73**	**0,78**
external causes (V01-Y98)							
Yakuts	3,28	2,84	3,20	3,07	2,07	2,18	2,07
ISNP of the North	5,02	4,48	4,91	6,00	2,97	3,45	3,74
Non-natives	2,66	2,53	2,24	2,29	3,00	2,88	2,97
RS (Y)	**3,00**	**2,72**	**2,73**	**2,74**	**2,60**	**2,57**	**2,57**

Currently it is causing great economic damage from external causes of mortality among the population of working age. Working age indigenous small in number peoples of the North in 2 times more likely than the non-natives and 1.3 times than the Yakuts, die from external causes, including prevailing traffic accidents, suicides, and accidental drowning attacks (Table 3). In the structure of mortality from external causes among the non-natives prevailed accidental poisoning and alcohol impacts compared with the indigenous people.

Table 3

The structure of the working-age population mortality from external causes by ethnic groups for the period 2005-2011 (1000 individual respective ethnic group)

Ethnic groups	Years						
	2005	2006	2007	2008	2009	2010	2011
Transportation accidents (V01-V99)							
Yakuts	0,32	0,23	0,16	0,21	0,19	0,17	0,23
ISNP of the North	0,43	0,22	0,16	0,11	0,43	0,08	0,08
Non-natives	0,30	0,34	0,16	0,20	0,22	0,22	0,35
RS (Y)	**0,32**	**0,29**	**0,16**	**0,20**	**0,21**	**0,19**	**0,29**
Intentional self-harm (X60-X84)							
Yakuts	0,87	0,76	0,93	0,84	0,50	0,53	0,58
ISNP of the North	1,73	1,30	2,00	1,89	0,92	1,16	1,45
Non-natives	0,49	0,46	0,36	0,43	0,75	0,54	0,58
RS (Y)	**0,69**	**0,61**	**0,66**	**0,65**	**0,65**	**0,56**	**0,61**
Attack (X85-Y09)							
Yakuts	0,80	0,69	0,72	0,23	0,38	0,41	0,37
ISNP of the North	3,29	0,70	1,19	0,65	0,16	0,58	0,58
Non-natives	0,48	0,47	0,50	0,20	0,53	0,55	0,51
RS (Y)	**0,70**	**0,57**	**0,61**	**0,23**	**0,46**	**0,49**	**0,45**
Accidental poisoning by and exposure to noxious substances (X40-X49)							
Yakuts	0,26	0,18	0,15	0,26	0,21	0,23	0,10
ISNP of the North	1,67	0,16	0,16	0,22	0,27	0,21	0,00
Non-natives	0,30	0,32	0,34	0,25	0,34	0,52	0,37
RS (Y)	**0,32**	**0,26**	**0,25**	**0,26**	**0,29**	**0,37**	**0,23**
Of them, accidental poisoning and exposure to alcohol (X45)							
Yakuts	0,15	0,05	0,07	0,13	0,11	0,14	0,04
ISNP of the North	0,22	0,05	0,11	0,05	0,05	0,17	0,00
Non-natives	0,18	0,18	0,09	0,11	0,15	0,23	0,16
RS (Y)	**0,17**	**0,12**	**0,08**	**0,11**	**0,13**	**0,18**	**0,10**
Accidental drowning and submersion (W65-W74)							
Yakuts	0,31	0,33	0,37	0,29	0,17	0,22	0,23
ISNP of the North	1,03	0,86	0,49	0,32	0,38	0,37	0,42
Non-natives	0,14	0,18	0,20	0,33	0,28	0,24	0,19
RS (Y)	**0,24**	**0,26**	**0,28**	**0,32**	**0,24**	**0,23**	**0,22**

High mortality from external causes among indigenous small in number peoples of the North due to social and hygienic plague the residents of the Far North due to the lack of state support for agriculture and extremely low efficiency of the health system in the field. Increased mortality from external causes is most typical for maladjusted and poorly adapted to the market segments of the population. As the number of deaths the first place non-working population is occupied, the second – the working-age population, performing low-skilled jobs, and located on a low social level [5].

Indicators of the working age population mortality from external causes in the Far Eastern Federal District above the Russian average by 15-20 % in some years. Fluctuations in mortality coincide with the social-economic crisis and the growing of population alcoholism as a manifestation of social exclusion. The greatest economic damage causes mortality from external causes among men of working age the northern regions of the FEFD: Chukotka Autonomous Okrug and Sakhalin Region, followed by the Republic of Sakha (Yakutia) by a considerable margin. These figures are higher than the average for the Far Eastern Federal District, and including the Magadan region, are much higher than in Russia. In the southern regions, the mortality rate is close to the average level for the Far Eastern Federal District, and in some regions is slightly lower [6].

In the country's population of working age has been a steady decline in mortality from cardiovascular diseases for the period 2005-2011 (Table 4). Ethnicity differences were characterized by the fact that the non-natives in 2.5 times more likely to die from acute myocardial infarction and alcoholic cardiomyopathy, in contrast to the indigenous people, who in turn in 1.2 times more likely cause of death was cerebrovascular accident.

Table4

The structure of the working age population mortality from cardiovascular diseases by ethnic groups for the period 2005-2011 (1000 working age population by ethnic group of persons)

Ethnic groups	Years						
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Ischemic heart disease (I20-I25)							
Yakuts	0,44	0,38	0,34	0,44	0,50	0,31	0,31
ISNP of the North	0,76	0,65	0,43	0,32	0,38	0,12	0,12
Non-natives	1,05	0,97	0,85	1,12	0,78	1,06	0,97
RS (Y)	**0,78**	**0,71**	**0,62**	**0,80**	**0,65**	**0,67**	**0,62**
Of them: acute myocardial infarction (I21)							
Yakuts	0,11	0,09	0,10	0,05	0,16	0,06	0,03
ISNP of the North	0,11	0,11	0,00	0,05	0,00	0,08	0,04
Non-natives	0,40	0,28	0,31	0,31	0,18	0,34	0,35
RS (Y)	**0,27**	**0,19**	**0,21**	**0,19**	**0,17**	**0,20**	**0,19**
Other heart disease (I30-I52)							
Yakuts	0,84	0,71	0,80	0,83	0,85	0,87	0,65
ISNP of the North	1,03	1,08	1,40	1,67	1,03	1,41	0,79
Non-natives	1,23	1,06	1,02	1,14	1,18	1,65	1,25
RS (Y)	**1,06**	**0,91**	**0,94**	**1,02**	**1,03**	**1,27**	**0,95**
Of them: alcoholic cardiomyopathy (I42.6)							
Yakuts	0,21	0,16	0,14	0,14	0,34	0,34	0,25
ISNP of the North	0,16	0,43	0,16	0,43	0,22	0,75	0,37
Non-natives	0,69	0,68	0,40	0,52	0,45	0,71	0,64
RS (Y)	**0,47**	**0,45**	**0,28**	**0,36**	**0,39**	**0,54**	**0,45**
Acute cerebrovascular ischemic type (I67.8)							
Yakuts	0,66	0,57	0,61	0,59	0,40	0,50	0,46
ISNP of the North	0,54	0,54	0,38	0,32	0,38	0,33	0,39
Non-natives	0,56	0,54	0,49	0,52	0,62	0,68	0,55
RS (Y)	**0,61**	**0,55**	**0,54**	**0,54**	**0,52**	**0,58**	**0,50**

Mortality from malignant tumors predominated among the non-natives of Yakutia (Table 5). It is noteworthy that during the analyzed period among the non-natives in 2 times more likely to die from cancer of the respiratory and chest and breast than the indigenous people. Indigenous peoples of the North, compared with Yakuts more likely to die from cancer of the digestive system. In the developed countries of Europe in the population of working age in the proportion of tumors accounted for about 30% of deaths [4].

Table 5

The structure of the working-age population mortality from malignant tumors by ethnic groups for the period 2005-2011 (1000 working age population by ethnic group of persons)

Ethnic groups	Years						
	2005	2006	2007	2008	2009	2010	2011
Malignant tumors of digestive organs (C15-C26)							
Yakuts	0,30	0,25	0,31	0,24	0,26	0,20	0,16
ISNP of the North	0,22	0,32	0,32	0,59	0,49	0,17	0,25
Non-natives	0,28	0,26	0,28	0,25	0,28	0,38	0,36
RS (Y)	**0,29**	**0,26**	**0,30**	**0,26**	**0,28**	**0,28**	**0,26**
Of them: malignant tumors of stomach (C16)							
Yakuts	0,11	0,10	0,09	0,08	0,09	0,07	0,06
ISNP of the North	0,11	0,22	0,16	0,22	0,11	0,08	0,08
Non-natives	0,10	0,07	0,11	0,07	0,10	0,12	0,13
RS (Y)	**0,10**	**0,09**	**0,10**	**0,08**	**0,09**	**0,09**	**0,09**
Malignant tumors of liver and intrahepatic bile ducts (C22)							
Yakuts	0,11	0,07	0,08	0,07	0,05	0,06	0,03
ISNP of the North	0,11	0,05	0,11	0,16	0,11	0,04	0,04
Non-natives	0,05	0,05	0,03	0,04	0,05	0,05	0,06
RS (Y)	**0,08**	**0,06**	**0,06**	**0,05**	**0,05**	**0,05**	**0,05**
Malignant tumors of respiratory and chest (C30-C39)							
Yakuts	0,12	0,13	0,10	0,14	0,19	0,09	0,11
ISNP of the North	0,05	0,11	0,16	0,00	0,11	0,12	0,08
Non-natives	0,26	0,25	0,25	0,21	0,26	0,26	0,25
RS (Y)	**0,19**	**0,19**	**0,18**	**0,18**	**0,23**	**0,17**	**0,18**
Malignant breast tumors (C50)							
Yakuts	0,01	0,03	0,03	0,02	0,03	0,01	0,01
ISNP of the North	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Non-natives	0,05	0,06	0,07	0,05	0,05	0,05	0,06
RS (Y)	**0,03**	**0,05**	**0,05**	**0,03**	**0,04**	**0,03**	**0,03**
Malignant tumors of female genital organs (C51-C58)							
Yakuts	0,07	0,05	0,05	0,07	0,04	0,04	0,04
ISNP of the North	0,11	0,11	0,05	0,05	0,00	0,00	0,04
Non-natives	0,15	0,06	0,06	0,07	0,09	0,07	0,08
RS (Y)	**0,11**	**0,05**	**0,06**	**0,07**	**0,06**	**0,05**	**0,06**

CONCLUSION

According to a comparative analysis of the main causes of mortality among working age population in the Republic of Sakha (Yakutia) for the period 2005-2011 it was shown that the non-natives are more likely than indigenous people died from cardiovascular diseases, including acute myocardial infarction and from malignant tumors. Non-natives are also the most vulnerable to alcohol abuse, among them was higher than deaths from alcoholic cardiomyopathy and accidental poisoning and alcohol impacts compared with the indigenous population of the republic. Mortality from external causes was higher among Indigenous Peoples of the North (69% of all causes of death) than the Yakuts and non-natives. Among the Yakuts, compared with the indigenous peoples of the North higher mortality from ischemic heart disease and cerebrovascular accidents.

In Yakutia harsh climatic conditions and medical and social maladjustment of the working age population ("polar stress syndrome", shift method of work, changing the traditional way of life and way of life of the indigenous population, "European" type of food, unemployment among the indigenous population, the increase in mass of stress factors, widespread prevalence of smoking and alcohol consumption and etc.) directly or indirectly affect the demographics including mortality, have an adverse effect on human health, deplete adaptive reserves of the organism, leading to the emergence of diseases, changing their course, contribute to premature aging and shortened life expectancy. The structure of causes of death in the Republic of Sakha (Yakutia) for the period under review for several years occupied the first place the external causes, the second – diseases of the circulatory system, the third – malignant tumors. Reduction of mortality in working age from preventable causes should be linked with the implementation of public prevention programs, increased availability and quality of medical care.

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THE IMMUNOGLOBULIN`S LEVEL OF SICKLY CHILDREN OF GENE POLYMORPHISM (ASP299GLY) TOLL-4 AND (SER249PRO) TOLL-6 RECEPTOR WITH ACUTE RESPIRATORY VIRAL INFECTIONS

ABSTRACT

In the article the role of polymorphisms of genes Toll-4 and Toll-6 receptor in the development of low antiviral defense of sickly children is examined. It is shown that in the blood of children the content of IgM, IgG and its subclasses increases, and the concentration of IgA is reduced. At the genetic mutations in (Asp 299 Gly) Toll-4 and (Ser 249 Pro) Toll-6 receptors synthesis of explored immunoglobulins is reduced, that is regarded as one of the reasons for the low antiviral defense of children with genetic defects in the immune system signaling receptors.

Keywords: immunoglobulins, SARS, Toll-4 and Toll-6 receptors.

INTRODUCTION

It is now well known, that low anti-infective protection of sickly children with acute respiratory viral infection is associated with failure of the innate immaturity of the adaptive immunity [1,2,3,7]. These children have a selective deficiency in T and B-lymphocytes, which is reflected in the level of immunoglobulins. The concentration of IgG, IgM, IgA, sIgA is reduced in the blood of sick children [6,8]. It is considered, that the immunological disorders can be either transitory in nature or genetically determined [9]. The search for the genetic bases of the high susceptibility to viral infections and it is in its infancy and mainly affects the polymorphism of genes regulatory cytokines. So, the group of authors [5] have established a link between the gene polymorphism of Il-1β, TNF-α, and increased risk of acute pathology of the upper respiratory tract. Some patients showed a genetically determined increased production of Pro-inflammatory mediators IL-1α and IL-1β. This leads to more pronounced symptoms of inflammation and prolonged disease course [9,10]. In earlier studies [2,3] we have found that 55.6% have a genetic defect in (Asp299Gly) Toll-4 receptor (genotype Asp/Gly and Gly/Gly) and 75% of genetic mutations in a marker (Ser249Pro) Toll-6 receptor (genotype Ser/Pro and Pro/Pro) among sickly children. The ligand for Toll-4 becomes a receptor of DNA viruses, and Toll-6 – lipopolysaccharide (LPS) of gram-negative bacteria. When the structure of these receptors is disturbed, then there is poor contact between the pathogen and receptors that, in turn, disrupts intracellular signaling and production of cytokines, which are regulators of adaptive immunity (4,10).

The object: to Determine the content of immunoglobulins IgA, s.IgA, IgM, IgG and its subclasses in the blood of frequently ill children with gene polymorphism (Asp299Gly) Toll-4 and (Ser249Pro) Toll-6 receptor, during viral respiratory infections.

MATERIALS AND METHODS

In the beginning of our research, we determined the content of immunoglobulins in the blood of 60 frequently ill children with URTI without considering the polymorphism (Asp299Gly) Toll-4 and (Ser249Pro) Toll-6 receptor. For this series the control was the blood of 35 healthy children. The age of the patients was from 1 year to 3 years (both in the experimental and control groups).

Next, we conducted a population-based research on 90 sick children with gene polymorphism (Asp299Gly) Toll-4, and 100 sick owners of polymorphism (Ser249Pro) Toll-6 receptor.

The etiological causes of the disease were: influenza 49%, parainfluenza in 26%, adenovirus infection 5% and 4% for respiratory syncytial virus. The criteria for inclusion in the study were: history of at least 6 episodes of URTI per year, ranging in age from 1 to 3 years, the first 3 days of illness.

The study did not include children with chronic bronchopulmonary diseases (asthma, recurrent bronchitis, malformations of the respiratory system, allergic diseases). The research was performed in the research Institute of medical ecology. The studied material was venous blood.

We used a sample of 76 healthy children (30 boys and 46 girls) aged from 1 year to 10 years as population control. DNA extraction was carried out using sets of "DNA-Express-blood" (NPF "LitEks", Moscow, Russia). The synthesis used in the work oligonucleotide primers are made by SPC "LitEks", Moscow. Detection of mutations was performed by PCR. The concentration of IgA, s.IgA, IgM, IgG with subclasses identified by solid-phase ELISA using reagents JSC "Vector-best", Novosibirsk.

The research was conducted on 90 sick children with URTI with gene polymorphisms of Toll-4 (Asp299Gly) and 100 sick owners with polymorphism of Toll-6 (Ser249Pro) receptors. Patients were divided into 7 groups: 1st group – healthy children (control); 2nd group – patients with URTI children with the genotype Asp/Asp gene polymorphism (Asp299Gly) Toll-4 receptor; 3d group – children with the genotype of Asp/Gly gene polymorphism (Asp299Gly) Toll-4 receptor; 4th group – owners of genotype Gly/Gly gene polymorphism (Asp299Gly) Toll-4 receptor; 5th group – owners of genotype Ser/Ser polymorphism of the gene (Ser249Pro) Toll-6 receptor; 6th group - owners of genotype Ser/Pro polymorphism (Ser249Pro) Toll-6 receptor and the 7th group were owners of genotype Pro/Pro polymorphism of the gene (Ser249Pro) Toll-6 receptor.

Statistical analyses were performed by the method of variation statistics using the software packages Microsoft Excel 2007, STATISTICA 6,0. Before the analysis, the variation series were tested for normality using the Shapiro-Wilk`s W. test. The criterion of student (t-test) was used in a normal distribution. The measurements were taken in the form of mean values with standard deviation (M±SD). The Mann-Whitney's test (U-test) was used in the abnormal distribution of the trait. The results are presented in a form of median (ME [25th; 75th percentiles]).

RESULTS AND DISCUSSION

In our studies we have found a blood, that was taken in the first days of admission of children to the hospital regardless of genotypes contains a high concentration of IgM, IgG and its subclasses IgG1, IgG3, IgG4 (table 1).

Such a rapid response of b-lymphocytes cannot be associated with the formation of the antigen-specific clone. Probably, as a result of frequent infections of children, memory cells remain and when the next contact with the antigen (AG) existing antigen specific cells of adaptive immunity, turning in the activated state, produce appropriate immunoglobulins. Perhaps, part of the immunoglobulin remains in the period of remission, and on this background begins the next respiratory infection.

However, the concentration of IgA of pediatric patients with URTI in the very beginning is low; the synthesis of sIgA is not increased, so the barrier antiviral protection of such children is weakened (table.1).

Table 1

The content of immunoglobulins in the blood of children with URTI (M±SD) (mg/ml)

The immunoglobulins	Healthy children, n=35	Patients with URTI, n=60
IgA	3,2±0,6	1,51±0,2*
sIgA	1,41±0,1	1,51±0,2
IgM	1,3±0,11	2,3±0,3*
IgG	4,3±1,32	13,6±1,3*
IgG_1	3,0±0,9	10,8±2,3*
IgG_2	1,2±0,3	1,8±0,3
IgG_3	0,3±0,7	1,3±0,2*
IgG_4	0,3±0,6	1,16±0,2*

Note: *– significance of differences between indicators of healthy and sick children.

Further, there were selected patients with gene polymorphisms (Asp299Gly) Toll-4 receptor and (Ser249Pro) Toll-6 receptor among the children. The concentration of immunoglobulins is determined by genotype. So, sick children with a polymorphism in the Toll-4 receptor have a low IgA level in all the analyzed genotypes (tab.2). Synthesis of sIgA is increased only in patients with the genotype Asp/Asp (gr.2).) The concentration of sIgA of the heterozygote (genotype/Gly) and homozygotes (genotype Gly/Gly), significantly less than that of the genotype Asp/Asp in the first days of the disease.

Regardless of genotype, the level of IgM of patients is higher than in controls (in controls to 1.3±0.1 mg/ml) on the first days of the disease (table.2). The content of this immunoglobulin of heterozygote Asp299Gly (gr.3) and of the mutant homozygote Gly/Gly (gr.4) are reduced, compared with the genotype Asp/Asp.

The concentration of IgG is high in all groups of patients with URTI, regardless of the presence or absence of genetic problems, however, in the group of sick children with complete replacement of alleles in the gene encoding Toll receptor-4 (Gly/Gly) synthesis of IgG is somewhat limited (to 15.2 mg/ml) compared with the genotype Asp/Asp genotype and Asp/Gly.

Table 2

The content of immunoglobulins of patients with URTI - owners of the Asp299Gly genotype in the gene Toll-4 receptor (median, 25-75 percentiles) (mg/ml).

Immunoglobulins	ealthy children (n=76) (1)	Asp/Asp (n=40) (2)	Asp/Gly (n=18) (3)	Gly/Gly (n=32) (4)
IgA	3,4 [2,7-4,7]	2,1 [1,2-2,8]	1,6*# [1,5-2,9]	1,4*# [1-2,1]
sIgA	1,4 [1,2-1,7]	3,4* [1-4,5]	1,5# [1,2-1,9]	1,6# [1,1-2]
IgM	1,3 [1,1-1,8]	2,4* [1,1-2,9]	1,7*# [1,1-2,3]	1,8*# [1,6-2,2]
IgG	4,3 [3,8-6,4]	17,3* [14,6-20,6]	16,6* [11,5-22,1]	15,2# [11-19]
IgG_1	3,0 [2,8-4,6]	15,3* [11-18,5]	14,8* [11,9-19,5]	16,0* [12,1-19]
IgG_2	1,2 [1-2,7]	2,3* [1,8-2,8]	1,9# [1,2-2,5]	1,7# [1,5-2,1]
IgG_3	0,3 [0,1-1,9]	1,3* [1-1,9]	1,6*# [0,8-1,9]	1,2* [1-1,8]
IgG_4	0,3 [0,1-1,8]	1,8* [1-2]	1,2*# [1,8-1,9]	1,1*# [1,1-1,7]

Note: U – Mann Whitney's test; * – significance of differences compared with the control. # – significance of differences compared with the group of owners of genotype Ar/Ar gene (Asp299Gly) Toll-4 receptor.

The high content of IgG was mainly due to IgG1 subclass, which level in all polymorphic variants of the gene Toll-4 to 5 times higher than the reference value (Asp/Asp – 15,3 mg/ml; Asp/Gly 14.8 and Gly/Gly -16,0 mg/ml).

A similar trend was observed for IgG3 and for IgG4. Their concentration was increased in all the analyzed groups of polymorphic alleles of the Toll-4 receptor. The content of IgG2 by owners of the mutant homozygote Gly/Gly and heterozygotes Asp/Gly was lower (1.7 mg/ml and 1.9 mg/ml) than by the owners of genotype Asp/Asp (2,3 mg/ml).

More striking defects in immunoglobulin synthesis was detected when was the genetic changes in the gene Toll-6 receptor (tab.3)

The concentration of anti-virus defender of IgA is significantly lower with patients who have the heterozygous variant of Ser/Pro in the gene Toll-6 receptors (1.4 mg/ml) and mutant homozygotes Pro/Pro (1.7 mg/ml) than of homozygotes Ser/Ser (2.1 mg/ml). This analogy is observed also for sIgA. Abnormal variants of polymorphic gene of Toll-6 have the sIgA level of 2.3 mg/ml and 2.4 mg/ml, that is significantly lower than of genotype Set/Ser (3.4 mg/ml).

Table 3

The immunoglobulin`s content of patients with URTI - holders of genotypes Ser249Pro in the gene Toll-6 receptors (median, 25-75 percentiles) (mg/ml)

The immunoglobulins	ealthy children (n=76) (1)	Ser/Ser (n=25) (5)	Ser/Pro (n=50) (6)	Pro/Pro (n=25) (7)
IgA	3,4 [2,7-4,7]	2,1 [1,1-2,8]	1,4*# [1,1-2,9]	1,7*# [1-2,2]
sIgA	1,4 [1,2-1,7]	3,4* [1-4,3]	2,3*# [1,3-3,2]	2,4*# [1-2,7]
IgM	1,3 [1,1-1,8]	2,6* [1,2-3,6]	1,8# [1-2,2]	1,9# [1,6-2,3]
IgG	4,3 [3,8-6,4]	17,3* [13,6-21]	13,6*# [12-21,2]	12,2*# [11-18,3]
IgG_1	3,0 [2,8-4,6]	15,3* [9-17,2]	12,8*# [10,2-18]	10,0*# [9-18,4]
IgG_2	1,2 [1-2,7]	4,3* [2-5,2]	1,8*# [1,2-3,1]	1,4*# [1-2,2]
IgG_3	0,3 [0,1-1,9]	1,2* [1-1,7]	1,4* [1-1,8]	1,3* [0,9-1,6]
IgG_4	0,3 [0,1-1,8]	2,8* [0,9-3,5]	1,3*# [1,1-1,8]	1,2*# [1-1,6]

Note: U – Mann Whitney's test; * – significance of differences compared owners of Ser/Ser genotype of the gene (Ser249Pro) Toll-6 receptor.

During the genetic defects in Toll-6 receptors, IgG synthesis (gr.6,7) is limited in the genotypes Pro/Pro and becomes lower than with children with the genotype Ser/Pro (13,6 mg/ml) and genotype Ser/Ser (17,3 mg/ml) (gr.5). The total background IgG is determined mainly by IgG1, which content of the mutant homozygotes (10 mg/ml) is lower than of owners of genotype Ser/Ser (15,3 mg/ml).

Limitations of the synthesis on IgG2 and on IgG4 were observed in the homozygous owners of genotype Pro/Pro in the gene Toll-6 receptor.

Thus, our studies have shown that polymorphism of genes, that's encode Toll-4 and Toll-6 receptors, affects the synthesis of all immunoglobulins (IgA, sIgA, IgM, IgG), the concentration of that varies with genetic defects in the

analyzed receptors. Perhaps genetic limit of antibody production are one of the causes of insolvency antiviral defense of sickly children.

CONCLUSIONS

The synthesis of immunoglobulins is reduced in comparison with a group of sick children from genetic defects in the receptors, during the point mutations in the genes of Toll-4 (Asp299Gly) and Toll-6 (Ser249Pro) receptors.

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RISK FACTORS FOR LUNG CANCER

ABSTRACT

The authors present the analysis of the main risk factors for lung cancer, such as smoking, including passive one, industrial pollution of environment, air pollution, ionizing radiation and et al. It has been shown that lung cancer should be referred to a socially significant morbidity, prevention and treatment problems of which are not settled yet.

Keywords: lung cancer, risk factors, malignant tumors.

In most countries lung cancer is a wide spread form of tumor and one of the most important medical and social-economic problems. About 1.6 mln new cases of the given morbidity are registered annually (about 1 mln men), 55% is in the developing countries. The largest number of patients is registered in Asia (54.3%), Europe (24.2%) and Northern America (14.7%) [37].

Lung cancer is in the 1st place in the MT morbidity structure. A proportion of the given pathology in developed countries is 13.0% (the 2nd place after colorectal cancer), in developing countries -12.4% (the 1st place). Lung cancer morbidity of women (8.5%) is less than men's morbidity (16.5%). Maximum proportion of men LC in European countries is (16.8%) and Northern America-(15.1%), women in Northern America (14.3) ,in Asia (9.4) [2.

One of the reasons of MT spread is population "ageing". Morbidity increase owing to demographic component will be-23.2% in developing countries, in developed ones it's lower-12.2% [42].

In the Russian Federation in 2010 81.4% of patients were men. 65.8% of patients were 60 and older. In 2010 women LC was in the 10th place, its proportion-3.8(in 1998-4.5%) "Rough" data (RD) of men and women morbidity was 40.2 o/oooo in 2010 (in 1998-44.2o/oooo). Standardized data (SD) of men morbidity (54.0o/oooo) is lower by 19.3% than in 1998. Maximum men morbidity is in the age group of 70-74, women-75 and more. The ratio of men and women morbidity at the age of 65-69 is 9.9. Middle age of morbidity is 64.4-men, 67.7-women [19].

The highest level of morbidity is found out in Siberia and Far East, men (307.4 and 291.4 o/oooo, women (218.6 and 214.2 o/oooo accordingly. The highest data of men morbidity are in Altai (104.9), in Magadan (104.4), women population- in Magadan (19.3), Zabaikalsk (14.6), Republic Tyba (12.1). Lung cancer risk in RF during a man life (0-74) is very high in 2010, it made up 6.85% (in 1989-9.86%), women risk is lower-0.86%.

According to (BO3) Committee data 90% of tumors are the result of outer reasons and 10% depends on genetic factors {35}. The main reason of lung cancer is smoking. Research data found out that 85-95% of men morbidity and 65-80% of women one etiologically are connected with smoking [48.56].

The first epidemiological works associating smoking with LC were published in Germany at the end of 1930 and in the 50s this fact was supported by some independent researches. Ten years later some serious activities were begun against this dangerous habit in Europe and the USA [57]. Tobacco smoke consists of nicotine and about 4000 chemical combinations out of which 438 ones promote LC: polycyclic aromatic hydrocarbons (PAH), benzopyrene, aromatic aminas (naphthylamine, aminobiphenyl), nitro-compounds, nitrosamine, vinyl chloride, benzol, formaldehyde, phenols, chromium, cadmium, polonium-210 free radical etc. [5.

Risk of men smoked some years ago increased 9-17 times depending on a number of smoked cigarettes a day. 10 cigarettes a day is equal to 8 morbidities with cancer, 10-19 cigarettes a day-19, 20-29 cigarettes-20, 30 cigarettes-35 [6.3].

In many countries a number of smoking women increased sharply and reached men's level {39}. LC of smoking women is equal to 12.7; 25-30 cigarettes a day increase morbidity to 20-30 {31,62}. Low data of women are the result of late starting to smoke. Carcinogen effect is the result of 20-25 latent period.

LC risk depends on duration of smoking [11,40]. Giving up smoking lowers a level of LC. Cumulative risk of men given up smoking at the age of 50-59 is equal to 7, at the age of 40-49- 5, at the age of before 40 is equal to non-smokers [6].

Passive smoking influences non-smokers 1.7 times. Metaanalysis of epidemiological researches found out that risk of non-smoking women at home and work increases by 17-25%, men-36%, at work-28% A longer smoke risk increases to 30% depending on a doze [27,61].

Industrial pollution of environment influences MT morbidity. Most occupational kinds of cancer are the result of carcinogen factors. A latent period lasts many years. A number of industrial LC is 6.7-15.0% [56,58.60].

Carcinogen substances (group 1, MAIR classification) increasing LC risk are asbestos, benzpirenium, beryllium, chlormethyl-ether, mustard gas, cadmium and its derivatives, crystalline silicon, arsenic, nickel and its combinations, talk, 2,3,7,8-tetrachlordybenzoparadioxide, formaldehyde vapour are coal-resin, chemical industry (rubber, soot, tar, pitch, mineral oils, strong , inorganic acids containing sulphuric acid vapour.

To industries having LC risk can be referred: aliminium and foundry industry, gasification and coal-coke, coal resin, chemical industry (rubber production, isopropyl alcohol, painting. LC risk is high for workers dealing with asbestos production, textile industry, ship-yards and cement production [59]. LC statistics is high for the following occupations: mining and quarry workers, wood production for women [24.25,33,34,36,47]. In RF state epidsupervision registered 328 occupational kinds of cancer, out of it 159- LC [3].

One of the main factors influencing a man risk to fall ill with LC is air pollution. People living in highly developed industrial cities, especially heavy, chemical, oil-chemical, oil-refining industries, suffer from LC than cities of light and food industry [2]. Non-smokers living on territories of high air pollution run the risk to die from LC. It's by 20% higher than people living on "clean" territories [43].

Benzpirenium (BP) is taken as an air pollution indicator. Long influence of BP increases the frequency of LC, it makes up 1.5-1.75 NG/M, it exceeds (.....) 1.5-2 times. Carburettor and dizel engines throw out 20 MCG/M of BP. A city inhabitant can inhale about 0.6 MCG of BP of car waste. 50 cigarettes have the same number of BP.

Epidemiological research comes to the conclusion that after smoke risk LC connected with the air pollution makes up 1.4-1.5. It's noticed in cities of Siberia and Far East [14,15]. Death risk from MT in polluted regions is 2.5 times, among men-2 times higher than in the planned region [10]. Not only big energetic plants but also waste of small boiler-houses and stoves can be a LC risk factor.

Ionizing radiation is a proved factor of MT. LC risk is very high for the people experienced atom bombing, irradiated for diagnosing and treating aims etc. {22.30}. LC risk is connected with breast R-ray in Russia and other countries of Eastern and Central Europe. People who had 11-20 X-ray examinations their risk was 1.33; 21-30 examinations- 1.49; 31-40 examinations- 1.52. Maximum risk was 2.15 of people who had more than 40 X-ray examinations {26}

In the USA 28347 workers of two atom enterprises got average doze 10m3v. A statistic tie between a doze, radiation and death is .....=17). Workers of radiochemical and plutonium 6,6m3v in their lungs. But in some epidemiological researches a high LC risk in atom enterprises is not proved [1.6,12].

Radon is an inert, heavy, invisible gas without smell made up from radium as a result of uranium dissociation and it's a natural source of ionizing radiation. Radon concentration in the atmosphere changes depending on a location, time, altitude and meteo conditions. It causes active influence on man inner organs (bronchils and lung epithelial). Researches carried out in Sweden, the USA, China, Moscow found out LC

risk increase by 3-14% due to a high level of radon in dwelling houses {6,8}. Radon is the second main factor after smoking causing LC. Carried out meta-analysis proved that radon caused 10% of all deaths and 30% of deaths from LC of non-smokers. The main source of radon and its product decay are building materials [17,19]. Concentration of radium in a stone, concrete, brick, gyps is about 40 BQ/KG (1……..) [13]. Wood is ecologically pure, specific radio-activity is lower 1BQ/KG.

Risk factors of LC are alcohol, overweight and passive physical activity [46.48.49,53]. Chronic inflammatory changes of bronchial membrane cause LC of most patients.

Research results confirm that one of the reasons causing cancer morbidities is concentration of free radicals in the organism. It can be protected by antioxidants of ferment and non-ferment nature. Under the influence of radiation, pollution and other factors free radicals are worked out. Redundancy of it and lack of antioxidants in the organism hurt nuclein acids, proteins and other macromolecule cells. People eating a large amount of fruit or vegetables, especially tomatoes [28,32] and a group of cruciferates [45 lower LC risk (21,38,44}. A group of cruciferates contains glucocynalates which of II phase detoxification (GST) [51.

Flavonoids contain antioxidants and anti-inflammation characteristics. Strawberries, green and black tea (katechin), Brussels sprout, apples, beans and onions (querrcetin) contain flavonoide and protect organism from LC blockading angiogenesis and throwing out apoptosis. Flavonoids also work against tobacco toxin protecting DNA [54].

Analysis of vitamin A is contradictory [44,52]. But its rich in vitamins reacts to chemical carcinogens and inhibits cell differentiation. Beta-carotene and vitamin E (alfa-tocopherol) are strong antioxidants, their role is to stop a process of carcinogen [5.7]. Deficit of vitamins B12, B6, 7, folic acid, zinc and iron causes two-chained DNA break similar to ionizing radiation [23,41].

Level of air pollution is high enough in towns of the Republic Sakha (Yakutia) as the town air is full of benzopyrene and formaldehyde, its average annual level exceeds the norm 2-3 times. Maximum concentration is reached: weighed substances-formaldehyde-2-2.5 ….., hydrogen supplied- 1.3 …… Average month concentration of benzopyrene exceeds the norm more than 7 times. The main reasons of the air pollution are transport overload in the town streets, lack of modern gas cleaning and dust-catching settings in the industrial units, waste of plants and factories, a low quality of roads, not enough green plantations, unsatisfactory situation of housing and communal services [4].

Thus, lung cancer should be referred to a socially significant morbidity, problems of which are not settled yet. Most oncologists are of the opinion that modern prophylaxis, high consciousness, self-control, perfection of early clinical diagnosis will play a great role in lowering death from oncology.

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The science and the experience on service of medical preventative care in Sakha (Yakutia) Republic`s Rospotrebnadzor system

ABSTRACT

In the article the authors presented the data of longitudinal scientific investigation in hygienics, sanitary and epidemiology. The sanitary- hygienic' and monitoring of consumer services' quality management is based on object and objective appraisal of factual data and analytical index, which build in system perspective in medico-ecological remediation in anthropogenic technologically disturbed and territories of different medical geographical zones.

It is shown that the state sanitary and epidemiological supervision (together with the state environmental control, industrial and geological), forming a social and hygienic monitoring (SHM) and interacting with a single service environmental monitoring, on the integral field ensures the effectiveness of the environmental system assessment (negative factors) and the risks to public health, development of forecasts and preventive recommendations.

Keywords: inventory analysis, standards (of general education - preventative medicine and quality management), scientific and process approaches, practical experience, preventative medicine, results rating, insertion, originality, value add and validation, medico-ecological value.

In recent years, at the turn of the XXI-century it has been approved [1] state requirements for all medical specialties of sanitary-epidemiological service.

Standards [5,6,7,8,9,10,19] defined the modern requirements to the format of the activity of specialists' medical and prophylactic business "and the need for scientific and methodological support has gained urgency with the introduction of social and hygienic monitoring (SHM) for identification and study of environmental factors and health risk assessment.

Fragmentary data on scientific and practical activities of employees of the Sakha Republic sanitary-epidemiological service (Yakutia) have been presented in the scientific potential [11] The institutions of the State Sanitary and Epidemiological Service of the Ministry of Health of Russia, and further regional offices and centers of hygiene and epidemiology of the Federal Service for Supervision in the Sphere consumer rights protection and human Well-being [4]. Scientific and applied research aspects of optimization [2] fit into the mechanism of coordination of basic and applied projects leading scientific institutions [3], with the definition and use of regional background values disturbances of public health [15] with regard to health and environmental innovations [17] in the industrial areas development in the Republic of Sakha (Yakutia). This multifactorial approach [16,18] in the system of accreditation of testing laboratories and testing laboratory centers formed for Quality Assurance (2000-2015.) In preventive medicine, including: quantitative chemical analysis from 281335 to 345940 Research, toxic-hygienic studies of 31259 to 33341 (tests), microbiology (bacteriology, virology, serology, parasitology) research from 702,422 to 794,734, the measurement of physical factors, including non-ionizing radiation from 71717 to 107 910 measurements, radiological measurements from 121360 to 160131 measurements. Marked quantitative characteristics with a high degree of confidence to the adoption of adequate, timely and forward-looking solutions that contribute to realization of scientific and practical problems [12,13,20,21].

Sanitary and epidemiological monitoring, which are constantly service professionals, provides great opportunities for research that laid the basis for the work itself.

This realization of the potential and development of scientific and methodological approaches to provide for Supervision of Consumer Rights Protection and Human Well-being, including the development of technologies and methods of organization of the state sanitary and epidemiological supervision in the conditions of the Far North and in the sparsely populated areas. Analysis of health indicators due to changing environmental factors, the research status of human immune status to assess the possibility of the disease, its flow and quality control of the formation of anti-infective (post-vaccination) immunity. Background comprehensive study of the sanitary conditions of the environment in industrialized cities and the state of health of the population of Yakutia based targeted approaches and measures to ensure the hygienic safety. As a major step in the field of preventive health care public policy of sanitary-epidemiological service is designed to carry out scientific and methodological support of the development and implementation of sanitary and hygienic maintenance of departmental and inter-departmental targeted programs.

Considerable scientific potential of sanitary-epidemiological service Yakutia puts on one of the first places in the Far East Federal District, and made her work specialists are appreciated at national congresses, conferences, forums and demand abroad.

His scientific work on the agreed, fundamental and applied areas of Yakutia experts sanepidsluzhby performed in collaboration with various scientific institutions (Institute of Epidemiology and Microbiology of the WSF SB RAMS - DE Savilov professor and VA Astafjevs, Irkutsk Institute of Siberia and the Far East - professor AS Maramovich, AD Botvinkin and M. Chesnokov, Novosibirsk State research Center of Virology and biotechnology "Vector" - Academician LS Sandakhchiev professor SV Netyosov and researchers EF Belanov, VE Repin;. NIIP Omsk, Central Research Institute of epidemiology in Moscow - professor GV B.L.Cherkassky and Yushchenko, St. Petersburg Pasteur EPRI, Khabarovsk NIIEM - professor VV richer and Associate professor I.E . Trotsenko). In Yakutia Service cooperates with the Health Institute of Applied Ecology of the North Institute of the PC (I) and the Institute of Biological Problems Cryolithozone. The research results were published in France, Japan, Argentina and Brazil, Germany, England, the USA and Japan. A certain number of works carried out under the auspices of the Academy of Sciences RS (I) - Academician BM Kershengolts, with scientists and NEFU YSC SB RAS.

According to its own content specialists of sanitary-epidemiological service is protected by 15 master's and two doctoral dissertations, each represented by a specific scientific school (Vladivostok, Khabarovsk, Irkutsk, Tomsk, Novosibirsk, Omsk, Moscow, St. Petersburg, Vladivostok), besides the stock materials research findings formed the basis of 27 dissertations scientists universities and research institutes from different Russian cities.

In the scientific arsenal of services PC State Prize (I) in the field of health and medical science to them. PA Petrov 2005 - "Research and practical provision of sanitary and epidemiological welfare of population of the Republic of Sakha (Yakutia) in the standard setting, and in emergency situations." The assets of the combined cycle of scientific publications (monographs, collections of scientific articles, a special supplement to the journal of microbiology, epidemiology and immunobiology of Medical Sciences, edited by the Chief Medical Officer of the Russian Federation, Academician GG Onishchenko. Material certifying the practical significance and the degree of utilization of the results, patronized etc. .m.n., prof. IY Yegorov), united by a common orientation on the scientific support of the formation and development of sanitary-epidemiological service in the Far North.

Particular attention should be comprehensiveness cycle works - regional issues of hygiene, sanitation, epidemiology and medical ecology: infectious aggressive environment zooantroponozam as incubators and genetic boiler pathogens (in relation to animal and human), micro-organisms and viruses, the influence of natural and anthropogenic factors on the sanitary and epidemiological situation. Sufficient examination is given the most intensive areas for industrial and economic development: the Central, South and Western Yakutia, the group Vilyuysky District and District, Kolyma ulus and the Arctic in general. Out of focus control and supervision of research is not excluded the quality of drinking water, food and air. Specialists services developed recommendations for monitoring, control and improvement of sanitary-epidemiological situation in the country. Published results have attracted the attention of

epidemiologists, health officers, hygienists, biologists, ecologists and physicians in clinical practice not only in Russia but also abroad. Cited authors (impakt-factor) is widely known in the scientific community.

A special section of the scientific work related to the implementation of mega-projects: the ESPO pipeline, railway, uranium deposits in the Aldan district of Cancún HPP Elga coal deposit and diamond properties in the Peace, Nakyn, "Lower Lena", "Diamonds of Anabar", "Verhnemunskoe mine "become objects of study inquisitive service specialists. Comprehensive assessment and forecast of sanitary, epidemiological, radiation environment (water, air, soil, viruses, bacteria) in the vast territory - is the collection, description and review of materials research and situation forecast not only for the future but also the assessment of the sanitary and epidemiological well-being of shift workers.

In the field of attention of the researchers was a pragmatic study of the most dangerous consequences of unsustainable human impacts on the environment in connection with the development of natural resources. The forward-looking statements and the assessment of possible risks in the areas of megaprojects were attentive, anticipating, preventive, applied nature.

A unique series of works made in collaboration with the Veterinary Service (candidate of veterinary sciences, chief state veterinary doctors on the basis of material assets tactical and strategic approaches: TD Karataeva, LI Makarova and Associate Professor of the Yakut State Agricultural Academy, candidate of veterinary sciences VS . Karpov).

Another area of research specialists of sanitary-epidemiological service of Yakutia in the format of "benefit-harm" - the study of the remains of extinct animals. The fact is that the permafrost - is a wonderful natural refrigerator, store the oldest, "canned" natural microbial communities, the ancient bank of genes and molecules. The importance of research into the cryosphere viable microbiota associated with the probability of finding them pathogens and the need to develop preventive measures in the event of their release due to thawing soils este¬stvennogo.

On the occasion of the international exhibition "EXPO-2005" in Japan, a joint team of scientists and experts of «Center of Sanitary Inspection in the PC (I)," YSC SB RAMS, North-Eastern Federal University and the Government of the Republic Center of Virology and Biotechnology "Vector "Institute of Siberia and the Far East was made the original series histomorphological and microbiological studies the main exhibit - the head Yukagir mammoth. The results are given not only an answer to the subject as possible, epizootic and epidemic danger of a biological object, but also enriched the paleontological science previously no known facts. The outcome of the interdepartmental community began work on the formation of the "Atlas of histomorphological studies mammoth remnants" and the program for further paleonto-microbiological research.

Among the research topics to which ownership of the specialists of sanitary-epidemiological service, especially the etiology and epidemiology of intestinal infections, viral hepatitis in Yakutia, the problem Viliuisk encephalitis, algorithmic base metodiche¬skih guidance for practitioners has been formed on the basis of the data obtained. A special place in the scientific study dealing with the problem of occupational diseases and forecasting of emergency situations related to graves in the permafrost zone. In Yakutia, was first obtained by the dead material from smallpox, buried in the permafrost zone, the analysis of historical data, the old-timers polls. It was found that frozen theoretically variola virus can maintain vital functions for at least 250 years, and then dumping can pose a danger to the public and should be under special control, especially in revitalization of economic activities and an accelerated development of the Arctic.

study the circulation of microorganisms in the urban ecosystem and microbiological research of snow cover in the northern latitudes were held. It was first diagnosed with the fact of dissemination of snow potentially pathogenic microorganisms, marked the point of characterizing the state of environmental pollution and contamination sources.

Today, ongoing research and training of researchers. The postgraduate study O.A.Ushkareva, L.S.Burnasheva, E.I.Lvova, A.N.Rumyantseva, L.M.Kornilova. Of particular note is successfully defended her thesis on O.N.Sofronovoy iersiniozov problems with 79.3% and novelty V.K.Yadrihinskoy a factor of reliability impact of environmental factors on the incidence of the population of intestinal infections by 62-90%.

This review [14] includes fragmentary-abstractive presentation of enormous work being done by service specialists. Subject-sizing specifics involves and declares the number of follow-up, deployed, thematic publications: environmental hygiene, northern epidemiology, medical and social monitoring and law, medical ecology.

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M.P.Dutkin

FOR QUALITATIVE AND AFFORDABLE MEDICINE

ABSTRACT

The article examines the main problems in modern Russian medicine. These problems were as a result of the work of the "Russian national front's" forum. Forum worked on September 7, 2015 titled "For quality and affordable medicine" and was dedicated to the health of the Russian Federation. The forum was chaired by the President of the Russian Federation Vladimir Putin. This event revealed many problems in modern Russian medicine: 1) low quality of care, 2) decrease of government expenditure on health, 3) reduction of a large number of specialists (reduced 90 thousand medical professionals) with a deficit of personnel, 4) rising prices for drugs, 5) low availability of primary care, especially in rural and remote drugs, 6) the impossibility of qualitative and free treatment in the hospital. The author focuses on the lack of funding of spending on medicine. For comparative quantitative indicators of different countries on health care for the 2013-14 years. The author highlighted the main problem of Russian health care low quality of medical care. This problem is caused by the crisis "Paternalistic" model of relations "doctor – patient". The relationship deprives the patient of the opportunity to make their own decisions and shifts it to the doctor. Instead of the proposed construction of "Partner" relationship. In this "systems" the doctor and patient see each other as equal partners or co-workers seeking a common goal – to eliminate diseases and protect the health of the patient. Bioethics – the moral teaching on human activities in medicine and biology. In a narrow sense, the term "bioethics" refers to the whole range of ethical problems in the relationship between doctor and patient. The author proposes to increase the hours of teaching should be given to presenting students with the principles of the "third force" in modern psychology – existential psychology. Existential-humanistic direction of psychology posits an individual approach to each patient, calls the physician to be able to find the "key to the soul" of any patient. This approach to patients greatly reduces the number of conflicts in the systems of relations "doctor – patient", which will undoubtedly lead to improving the image of Russian medicine.

Keywords: problems of the Russian medicine, the poor quality of medical care, the crisis of the system of relations "doctor – patient", "Paternalistic" system (model) relationship, the "Partner" systems of relations, bioethics, existential psychology.

September 7, 2015 the forum of the "Russian national fronts" on the state of health of the Russian Federation with the participation of President Vladimir Putin took place. The forum was titled "For quality and affordable medicine!". This forum has exposed many problems in modern Russian medicine: 1) low quality of care, 2) decrease of government expenditure on health, 3) reduction of a large number of specialists (reduced 90 thousand medical professionals) with a deficit of personnel, 4) rising prices for drugs, 5) low availability of primary care, especially in rural and remote drugs, 6) the impossibility of qualitative and free treatment in the hospital.

The main problem of modern Russian care is the low quality of medical care provided. With every year increases the flow of written complaints of patients on rude attitude of the medical staff, a growing number of lawsuits on compensation of harm of life and health caused by medical assistance. The cases of the murder of as an act of revenge.

Poor quality of care associated with the second problem with the reduction of government expenditure on health. The lack of money in the health care system leads to the low wages of the medical staff. Disappears the motivation for productive work. According to the founder D. Watson formula S→R (where S is stimulus, R is response) is the unit of analysis of the behavior of any person. This means that lack of stimulation leads to very different consequences. Nice stimulation leads to the correct, expected behavior, which in our case means a high quality of care.

The main financial indicator in determining the level of development and the relationship of the state to the health of population, is the share of health expenditure in GDP. The United States sent to health care 17%, Germany – 11.3%, France - 11.5%, Switzerland -11.7%, Portugal – 10.2% [2].

According to the Russian statistical Committee of the Russian Federation in 2013 was spent on health care 3.8% of GDP. The problem of low funding in our country – the problem of old. Since the days of the Soviet Union in the financing of health care was used so-called "residual principle".

Doctor of medical Sciences, President of "the National Centre of sanitary education of the population" (SANPROSVET) V. Volodin in the article "the RESIDUAL PRINCIPLE: the legal and Financial component of health of Russia" writes that "the residual principle" of funding health care in our country came from the division of labor on productivity in the material sphere and non-productive labor in the social sphere [3]. Hence there is "residual principle" of financial investments in social infrastructure, leading to an underestimation of the human factor. This leads to the belittling of the social status of knowledge, genuine professionalism.

According to the President of the Russian Federation money on health care government allocated sufficient. The average funding of healthcare over the last three or four years – 3.6% of the GDP. It is about 500 billion rubles a year. The problem is, how effectively and how these funds are spent.

Low quality of care caused is a consequence of the crisis of relations "doctor – patient". This old systems was called "Paternalistic" and was more typical of a totalitarian political system [1].

"Paternalist" system (model) of the relationship between doctor and patient is based on several prerequisites: a) in terms of healing, health and life are priority values; b) ethical position of a doctor is reflected in the principle of "Giving the patient help, don't pay him ham"; c) the principle deprives the patient of the opportunity to make their own decisions and shifts it to the doctor. Thus, the physician assumes the image of "Father" (the Latin word "Pater") or "Parent", and the patient is endowed with the image of a "Child". The word "Father" is traditionally served as a metaphor God and the priest and, accordingly, the doctor gains the status of unquestionable authority.

"Paternalistic" model has played an important role in the history of medicine. With the assertion of a paternalistic relationship between doctor and patient involves bridging the gap of morality and life, rooting ethics in medicine. But at the same time, the moral authority of the doctor having such an effect on the patient inhibits his freedom and dignity. The patient will complain of infringement of their civil rights.

In a democratic society, received the recognition of "Partnership" ("collegial") system of the relationship between doctor and patient. In this system (model) the doctor and the patient must see each other as equal partners or co-workers seeking a common coal – to eliminate diseases and protect the health of the patient.

It is in a collegial type of trust plays a crucial role. When two people or two groups of people truly pursue common coals, their confidence is justified, and the model of collegial type adequate. Here there is equality and in the dignity and respect that was not inherent in the paternalistic model.

The "collegial" model involves the principle of "informed consent" as the voluntary acceptance of the patient's course of treatment or therapeutic procedures after providing the doctor with adequate information. The doctor must inform the patient about: a) the nature and purpose of the treatment; b) associated significant risk; c) possible alternatives to this type of treatment.

From an ethical point of view, the concept of alternatives to the proposed treatment is central to the idea of "informed consent". The doctor gives advice about the most appropriate from a medical option, but the final decision is made by the patient based on their moral values. Thus, the doctor treats the patient as a goal and not as means to achieve other goals, even if it is health.

Russian society in its development adopted democratic values, but the medical community is not in hurry to catch up with it. This is evidenced by the dissatisfaction with the Russian society the quality of medical services.

To exit from the systemic crisis of health care we see in the teaching in medical school of a new scientific discipline of "bioethics". Bioethics – the moral teaching on human activities in medicine and biology. In a narrow sense, the term "bioethics" refers to the whole range of ethical problems in the relationship between doctor and patient.

To exit from the crisis of Russian health care should increase the hours of teaching medical psychology, where more time and attention should be given to presenting students with the principles of the "third force" in modern psychology - existential psychology. Existential-humanistic direction of psychology posits an individual approach to each patient, calls the physician to be able to find the "key to the soul" of any patient. This approach to patients greatly reduces the number of conflicts in the system of relations "doctor – patient", which will undoubtedly lead to the exit of Russian medicine from a systemic crisis.

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THE USE OF IMMUNOTHERAPY IN CHILDREN WITH RECURRENT BRONCHITIS

ABSTRACT

Recurrent bronchitis in childhood can lead to negative consequences in the form of sensitization and allergic diseases, including bronchial asthma.

The aim: to research the clinical and immunological efficacy of broncho-vaxom in the group of children with recurrent bronchitis.

Materials and methods: we examined 50 children with recurrent bronchitis (monthly) on the basis of allergo-immunological Department National Hospital №1 of Republik Sakha (Yakutskia). All children surveyed: general blood test and determination of the immune and cytokine status. 25 children received the drug, broncho-vaxom application of expectorants and mucolytic agents, another group (25 children) received only expectorants and mucolytic drugs.

Results: in the analysis of changes of the immune status revealed the greatest decline in T-cell component and components of complement in children with recurrent bronchitis. In children with recurrent bronchitis increased levels of CIK, a reduced level of IFN-γ FNO-ά. 25 examined children with recurrent bronchitis medication used broncho-vaxom representing the lyophilisate of bacteria inhabiting the respiratory tract. The therapy was carried out ten-day course (1 capsule per day) for three months. In the analysis of changes of the immune status revealed an increased level of performance of T-cell (CD3+, CD4+, CD8+, CD16+) and immunoglobulins (IgA), the C4 component of compliment, as well as indicators of the level of blood cytokines (IL-1, FNO-ά).

Conclusions: as a result of drug therapy of broncho-vaxom marked improvement in immune status and the absence of recurrence of bronchitis for the next 3 months after the therapy.

Keywords: bronchitis, immune status, immunocorrection, sensitization, efficiency, cytokines, immunoglobulins

INTRODUCTION

Recurrent bronchitis in childhood can lead to negative consequences in the form of sensitization and allergic diseases, including bronchial asthma. Recurrent bronchitis is an inflammation of the bronchi, which are repeated in the course of the year 3 times or more, when the duration of each exacerbation for at least 2 weeks. The majority of domestic and foreign pediatricians believe that children are specific recurrent bronchitis, and chronic bronchitis in children is always secondary, developed in other diseases and pathological conditions of respiratory system [1,2,3,4,5,6,7,8,9].

In the formation of recurrent bronchitis in children a specific role of endogenous and exogenous factors. Among the endogenous determinants of the development of the disease include: family history (diseases of the respiratory tract in parents and sibs about 75% of the observations), belonging to blood group 0(1), constitutional features (lymphatic and exudative-catarrhal anomalies Constitution), premorbid background (adverse antenatal period, fetal hypotrophy, rickets, etc.).

The use of immunomodulators is a topical method of treatment in children with recurrent bronchitis [1,2,3,4,5,6,7,8,9].

The aim of the study: to Study clinical and immunological efficacy of broncho-vaxom (manufacturer "Takeda") in the group of children with recurrent bronchitis

MATERIALS AND METHODS

The study included 50 children with recurrent bronchitis (monthly) on the basis of allergo-immunological Department National Hospital №1 of Republik Sakha (Yakutskia) Yakutsk. All children surveyed: general blood test and determination of the immune and cytokine status. 25 children received the drug, broncho-vaxom application of expectorants and mucolytic agents, another group (25детей) received only expectorants and mucolytic drugs.

THE RESULTS OF OWN RESEARCH

In the analysis of changes of the immune status revealed the greatest decline in T-cell component and components of complement in children with recurrent bronchitis. In children with recurrent bronchitis increased levels of CIK, a reduced level of IFN-γ FNO-ά, IL-1. IgA levels are reduced, levels of IgM, IgG did not differ significantly from normal values (Table1).

25 examined children with recurrent bronchitis medication used broncho-vaxom representing the lyophilisate of bacteria inhabiting the respiratory tract. The therapy was carried out ten-day course (1 capsule per day) for three months. All patients were observed for 3 months after receiving the drug therapy of broncho-vaxom, recurrent bronchitis none of the children was not recorded.

In the analysis of changes of the immune status revealed an increased level of performance of T-cell (CD3+, CD4+, CD8+, CD16+) and b-cell immunity (IgA), the C4 component of compliment, as well as indicators of the level of blood cytokines (IL-1, FNO-ά)(таble2).

CONCLUSIONS

As a result of drug therapy of broncho-vaxom marked improvement in immune status and the absence of recurrence of bronchitis for the next 3 months after the therapy.

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Table 1

Indicators of immune status in children of Sakha (Yakutia) in children with recurrent bronchitis and healthy children (n = 100)

Indicators	Children with recurrent bronchitis (n = 100) M ± m	Healthy children (n = 100) M ± m
CD3+	19,2 ± 1,03	27,2±1,04*
CD4+	11,9 ± 0,5	21,3±0,6*
CD8+	16,9 ± 0,8	12,1±2.5
CD16+	7,1 ± 1,2	11,0±1,01
IRI	0,7 ± 0,6	1,08±0,02
IgA	1,6 ± 0,1	2,9±0,6*
IgG	12,2 ± 0,7	17,1±0,09
IgM	1,8 ± 0,08	2,2±0,09
CD22+	13,9 ± 1,2	24,6±0,7*
C3	0,23 ± 0,02	0,5±0,04*
C4	0,11 ± 0,02	0,26±0,03*
CIK	186,2 ± 1,5<0,05	70±0,07
IL-1	0,21 ± 0,001	0,49±0,07*
IFN-γ	0,16 ± 0,01	0,6±0,05*
FNO-ά	0,32 ± 0,01	0,78±0,07*

*p < 0.05 between norms and obtained values in each group.

Table 2

Indicators of immune status in children of Sakha (Yakutia) in children with recurrent bronchitis before and after drug therapy broncho-vaxom

Indicators	Children of Sakha (Yakutia) in children with recurrent bronchitis before drug therapy broncho-vaxom (n = 100) M ± m	Children of Sakha (Yakutia) in children with recurrent bronchitis after drug therapy broncho-vaxom (n = 100) M ± m
CD3+	19,2 ± 1,03	61,4±3,04*
CD4+	11,9 ± 0,5	26,6±0,75*
CD8+	16,9 ± 0,8	15,4±3.5*
CD16+	7,1 ± 1,2	16,0±1,01*
IRI	0,7 ± 0,6	1,72±0,04
IgA	1,6 ± 0,1	2,5±0,09*
IgG	12,2 ± 0,7	16,5±1,09
IgM	1,8 ± 0,08	2,5±0,09
CD22+	13,9 ± 1,2	21,6±0,97
C3	0,23 ± 0,02	0,4±0,05*
C4	0,11 ± 0,02	0,3±0,03
CIK	186,2 ± 1,5<0,05	50±0,07
IL-1	0,21 ± 0,001	0,54±0,03*
IFN-γ	0,16 ± 0,01	0,32±0,04
FNO-ά	0,32 ± 0,01	0,78±0,07*

*p < 0.05 between norms and obtained values in each group.