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HEALTHY LIFESTYLE

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POLICY OF HEALTHY NUTRITION OF SAKHA REPUBLIC (YAKUTIA) POPULATION

ABSTRACT

The generalized materials of the priority directions of a state policy in the field of healthy food of the population in extreme conditions of the North are presented in article; results of epidemiological, hygienic and clinical trials. Questions of quality and safety of food, maintaining food and innovative policy in the region, development of modern food technologies and creation of new types of food of a functional purpose are considered. Regional aspects of optimization of food structure of various groups of the population, including pregnant women and nursing mothers, children and adolescents, youth and adult population with various nutritional and dietary requirements are shown. The leading role of the Centers of health and offices of healthy food in formation among the population of skills and feeding culture and prevention of the diseases connected with food violation is defined. Mechanisms of creation of effective information system in the field of monitoring of food, promotion and promoting of ideas of
healthy food are offered.

Keywords: policy of healthy food, extreme conditions, fundamental bases, regional aspects, food optimization, Health centers, nutritiology,

Balanced, rational food based on ethnic peculiarities is the backbone of every person. Correct and optimal nutrition is firstly and foremost nutrition completely supplying all human demands in energy and other major nutrients: proteins, fats, carbohydrates, dietary fibers, minerals, microelements, and other biologically active components.

The Far North and climatically equal areas comprise more than 60% of the Russian territory. And, extremely severe natural and climatic conditions of the Sakha Republic (Yakutia) demand higher requirements to the population's health. Insurance of optimal life activity of people in this area, particularly supply with adequate nutrition is of great social and medical significance in the period of economic transformations.

Alterations in nutrition character lead to development of diseases related to metabolic disadaptation. Among them are cases of ischemic heart and brain diseases, arterial hypertension, metabolic diseases, i.e. obesity, diabetes, pathology of locomotor system, anemia, digestive tract diseases, etc. which are significantly common among indigenous and newly arrived populations of the republic during last 2-3 decades. According to data of the Territorial body of the Federal Service for Statistics in the Sakha Republic, during recent 5 years the dynamics of endocrine system, metabolism, and immune system diseases show a 22% increase, and blood circulation system diseases rose by 45,6%. Anemia cases in the Sakha Republic exceed average Russian rates by 1.7, obesity cases by 1.1, gallbladder and biliary tract diseases by 1.3, liver diseases by 2.6 раза and pancreas diseases by 1.6.

Mother and child health is one of the most significant indices defining the economic, intellectual, and cultural potential of a country. Good nutrition of a pregnant female and breastfeeding mother, support of breastfeeding make major conditions of birth, growth, and development of a healthy child. In spite of obvious

advantages of breastfeeding recommended by WHO and UNICEF for first years, the system of breastfeeding support is underdeveloped in Sakha. Currently, the issues of organization of pregnant female and breastfeeding mother feeding are in the focus in the republic. Results of the research work evidence a significant contribution of malnutrition of pregnant and breastfeeding women in development of complications during pregnancy, childbirth and puerperium.

According to the 2014 data, lower levels of breastfeeding distribution are noted in Sakha people. In recent decades, the number of infants on breastfeeding up to 6 months stays on the level and ranges from 48.1% to 51.3%. By the first year, the number of breastfed infants falls almost 2 times, 26.7% and 29.5% , respectively. Meanwhile, an effective experience of work of the Obstetric Hospital of the Yakut Clinical Hospital should be noted. During 6 years of active support of breastfeeding within the framework of the international program “Hospital friendly to a Child”, level of breastfeeding increased from 60% to 99%.

Support of breastfeeding in the Sakha Republic is one of the priorities of health care, while the work on awareness promotion, support, and stimulation of breastfeeding is extremely important and is worth of a special attention.

Educational institutions make a unified system of public education encompassing during a long period of time all children and adolescent population of the republic. More than 70 % of children and teenagers spend the most part of a day in preschool and school educational institutions. The education and training period in the educational organization coincides with the period of growth and development of a child when an organism is most sensitive to influence of various factors of environment. In the meantime, fast growth and intensive processes of metabolism, demand constant food receipt of enough qualitative fibers, fats, carbohydrates, vitamins, mineral salts and microcells. However, population monitoring researches of the last years (2008-2014) conducted by employees of the Center of Nutrition SRI of health NEFU of M.K.Ammosov in three medical and economic zones of the republic testify to essential deviances of variety of food substances at children and teenagers’ nutrition , first of all, vitamins A, With, B_2, iron and calcium, iodine, polynonsaturated fat acids, food fibres. Results of these researches have shown authentic communication of poor-quality food with development of iron-deficient conditions and anemias, osteopenic conditions and osteoporosis, iodine defficient conditions and endocrinopathy. The dynamics rates during the last decades evidences statistically relevant increase of obesity cases among the youth population of the Sakha Republic. Prevalence of obesity in agricultural regions (from 2.6 to 11.3) was statistically lower than that in the Arctic (from 4.6 to 14.6 (3 times)) and industrial (from 5.9 to 17.2 (4 times per 1000 children) regions.

Due to imbalance in school feeding, health and anthropogenic characteristics of children and adolescents deteriorate from junior to senior grades. Currently, less than 5% of junior year pupils are to be considered absolutely healthy. In senior year student groups, these rates are reduced to 2%. In view of this, implementation of the federal program on updating school feeding programs in 2010-2011contributed into positive trends in feeding of children and adolescents in educational institutions of the Sakha Republic. During this time, 22 pilot schools of the Sakha Republic (the Megino-Kangalasskyi, Khangalsskyi, and Olekminskyu regions) were equipped with modern technologies to provide schools with hot meals twice a day. Following implementation of the project, a network of agricultural schools promoting the idea of healthy food is being established.

By data of the Department of the Federal Service for Consumer Rights in the Sakha Republic, during previous 3 years, the portion of the 3rd group subjects decreased by 1.5, while that of the 1st group favorable in terms of sanitary and epidemiological requirements increased by 3.6%.

In 2014, coverage of schools by hot meals increased from 97% to 99% (in the Russian Federation - 85.1%), by age groups: 100% (in the Russian Federation-95.4%) of 1-4 years; 99.2% (in the Russian Federation – 77.5%) of 5-11 years. In 2014, 58% of school children are fed 2 times a day with hot meals (in Russia - 26.6%), which is 8% higher as compared with rates of 2012. School meals being unvaried do not meet physiological requirements of children in energy and nutrients for nornal functioning of their organism. The portion of 3-5 group school children (with chronic diseases) in schools where hot meals are served made 13% (in Russia-21.5%).

In 2011-2013, the number of ready-made dishes that do not meet hygienic standards by sanitary-chemical and microbiological characteristics is shown to decrease (by 0.3% and 1.0% respectively), while the portion of samples not conforming with standards by calorie and vitamin C content has increased by 11.2%.

Major problems in optimization of feeding in educational institutions of the Sakha Republic are the absence of systematized organization of children and adolescent feeding; insufficient quality equipment and material-technical base of kitchens and canteens; the lack of nutrition units for pre-school and school feeding; the lack of unified menus according to physiological requirements of children and adolescents in view of peculiarities of their living conditions, education, and eating habits; problems of provision of rural schools with cold and hot water; the lack of the nutrition monitoring system; unsifficiently developed transportation infrastructure in Sakha, food products are delivered to remote northern areas during short navigation period by air, which complicates supply of educational institutions with food products, and thus- organizations of feeding at kindergartens and schools; understaffed and not staffed educational institutions in terms of qualified professionals in catering.

Resulting from nutrition imbalance during study, a lot of students develop digestive tract diseases, anemia, hypertension, neuroses, etc. Results of research into actual feeding of vocational and higher educational institution students in Sakha evidenced lack in their diet of such relevant food products as dairy products, fish, and eggs. Their dietary intake showed excessive use of bakery, confectionary, sugar products and sweets.

Also issues of catering in welfare, medical and prophylactic institutions of Sakha are of great importance: lack of qualified professionals, insufficient supply with high-quality food products, lack of special products, etc.

Major reasons of reduction of the long living people number are unhealthy lifestyle, improper eating habits, low supply of the population with local food products, usage of imported foods. The average female life-span in Sakha makes 71.4 years, in males – 58 years. The difference makes 13.4 years (Demographic situation in rural areas of the RS(Y). – Yakutsk, 2007. – P.17.)

For the recent years an increase of anthropogenic and technogenic human-made impacts on the environment can be noted. Under extreme climatic conditions of Yakutia, environmental contamination rates are exclusively high. In this context, special attention is given to monitoring of contamination of the environment with various toxic substances along the food chain: soil→plants→crop sector and animal husbandry production→human. In Yakutia, the dominant indikacors are the Yakutian horse and reindeer meat, pasuring the whole year,river and lake fish, plant growing production, and organic herbs. The most important indicators of the environemntal state are health, disease rates in agreement with social and economic factors, sanitary and hygienic conditions, the ecological state of the environs, and the quality of food products.

Results of monitoring of the quality and safety of food material and food products evidence that during the last 2 decades, the portion of production not meeting the microbiological standards ranges between 12-11%, while in 2014 году this rate made 9.5%, thus exceeding an average Russian rates twice (In 2013, the Russian rates were equal to 4.6%). However, the last decade witnesses the stable trend towards reduction of volumes of substandard food samples: in milk and dairy products - by 2.1 (in 2000 - 20.2%, in 2014- 9.5%); in meat and meat products -

by 1.7 (in 2000- 11.6%, 2014 - 6.5); in bakery- by 1.5 (in 2000 - 10.5%, in 2014 - 6.7%). In Sakha people, a tendency of lower volumes of chemically substandard food samples has been noted: from 5.8% in 1997to 0.5% in 2014, which is at the similar level as the Russian average (in Russia, in 2013- 0.6%). According to data of the Department of the Federal Service for Consumer Rights in the Sakha Republic, during last 8 years, a decrease of volumes of substandard food samples in terms of parasitological sanitary-epidemiological requirements by 0.5% (from 1.6% in 2007 to 1.1% in 2014) is observed.

The absence of unified feeding system results in various interpretations in elaboration of various programs on production, food supply, and distribution of budgetary funds, and rational nutrition of population in the Sakha Republic.

Many aspects of eating habits of indigenous population of the Extreme North: dairy products, kumyss-fermented milk, saltless diet, frequent consumption of food (particularly, fats) under low temperatures, etc. are considered reasonable and useful in terms of hygiene. The Sakha Republic holds unique natural raw materials to produce foods for common and special-purpose usage.

Under current ecological conditions, our objective is re-orientation of communities to consumption of healthy food products.

In the Russian Federation, state programs are operating aimed at improvement of nutrition, as one of the most important factors defining health of the population. Implementation of adopted documents in the Russian Federation subjects requires updating considering regional peculiarities and traditions.

To facilitate awareness of healthy food links with population health, since 2001, the Research Institute for Nutrition, North-Eastern Federal University, has begun monitoring actual feeding and eating habits of various group population living in Sakha, including the most fragile groups of pregnant females, breastfeeding mothers, children, adolescents, and elderly people. This work is performed within the framework of implementation of the Concept of State Policy in Healthy Nutrition of the Sakha Republic Population.

The Sakha Republic is a participant in international programs, one of which is prediction of chronic non-contagious diseases (CINDI). work on awareness creation of healthy lifestyle, including healthy eating habits is performed using the network of medical prophylaxis divisions and Centres for Healthcare, Health Ministry, Sakha Republic. In medical centers work Schools of Health, including programs of Schools of Nutrition and Schools of Breastfeeding aimed at medical workers and wider population (The order of the Health Ministry, Sakha Republic "On Extension of Network of Schools of Health №01-8/4-17, 26.01.2005.).

One more international program is "Mother and Child" on breastfeeding support which has been implemented since 2005. Improvement of the legislative basis of the Russian health care system aimed at protection and support of breastfeeding, implementation of the WHO and UNICEF initiative "Hospital Friendly to a Child" at obstetrics and and child care centers distribute into positive dynamics of breastfeeding promotion. Within the framework of the program, in April, 2012, two medical organizations of the Ministry of Health RS(Y) were granted with international certificates "Hospital Friendly to a Child". The next step in breastfeeding promotion was establishment of the Scientific and Practical Center for Support, Promotion, and Stimulation of Breastfeeding, Health Ministry, Sakha Republic, and the Coordination Council on Support, Promotion, and Stimulation of Breastfeeding, Health Ministry, Sakha Republic in November, 2012 (the order of the Health Ministry, Sakha Republic "On Establishment of the Coordination Council on Support, Promotion, and Stimulation of Breastfeeding, Health Ministry, Sakha Republic", №01-8/4-1936, 17.11.2012.).

A special attention is given to children feeding. In 2006, by the decree of the Sakha Republic President was adopted the Sakha Republic Law "On Authorization of Bodies of Self-Governance of Municipal Districts and Regions of the Sakha Republic with State Powers of Provision of Children up to Three Years with Free of Charge Feeding" №2533, 07. 02. 2006.), which was prolonged by the decree of the Sakha Republic government, 16.04.2015, №105 "On the Order of Provision of Pregnant Women, Feeding Mothers, and Children up to Three Years with Feeding in the Sakha Republic (Yakutia)".

Issues of prediction and treatment of child diseases connected with feeding disorders are of special interest at advanced-level courses for medical workers on Sakha. Employees of children medical, recreational, vocational, higher educational, and research institutions studied at professional advancement courses.

In accordance with the "Plan of Organizational Activities of the Sakha Republic Government, 2010-2012", the session of the Scientific Council on Medical Problems of Nutrition, Russian Academy of Medical Sciences "Problems of Sakha Republic Population Nutrition" was conducted for the first time in Sakha, and the inter regional scientific-practical conference " Nutrition as Basis of Healthy Life and Population Health in the North" with participation of the Research Institute of Nutrition, leading Russian nutritionists representatives of various ministries and departments, research institutes, higher educational, vocational, and medical institutions, secondary schools and manufacturers.

Following the session the Agreement on Cooperation between the Sakha Republic government and the Research Institute for nutrition has been concluded. According to the Agreement, the major objectives of improvement of feeding structure and health rates to increase living standards of the Sakha Republic population should be fulfilled. The results of the activities was inclusion of the Sakha Republic into the federal program of updating school feeding in 2010-2011 within the framework of the priority national project "Education". Follwing elaboration of the program, in 2012, the Republican Centre for Recreation and Health Care of Children "Pine Forest" was established by the decree of the Sakha government, as a coordinator of work on healthy feeding promotion in educational institutions of the Sakha Republic (Yakutia).

It is relevant to rise awareness among population of healthy food and nutrition issues the essence of which is to be put as follows: healthy nutrition =ecological potential + healthy assortment of food products + levels of awareness of healthy foods.

Not only official mass media of the republic, but also commercial organizations should contribute into increase of awareness of healthy foods.

Health strengthening, reduction of alimentary-dependent disease distribution, and growth of an average life-span among local population and and newcomers in the Sakha Republic due to development of the theory and practice of individual feeding, elaboration of efficient technologies and methods of prophylaxis of health disorders from the young age, and an increase of adaptations of local residents and newcomers to changing climatic conditions and globalization of the Arctic territories, as well as security of food safety of the republic are the most dire issues of the social and economic development of the region. effective interactions of the Sakha Republic government, Federal supervision, educational, and research institutions, businesses and non-governmental organization play the dominant role in solution of the issues.

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The Foreground Directions of Preventive Service Activity in the Republic Sakha (Yakutia): Healthy Nutrition and Disease Prevention Propaganda

ABSTRACT

During the period since the adoption of the Doctrine of a healthy lifestyle in the Republic a holistic organizational - economic, scientific-methodical, informational and educational mechanism for implementing policy for healthy lifestyle and nutrition among different population groups has been formed. The priority trends of the campaign, one of which is the promotion and skills training and a healthy food, contributing to the prevention of nutrition-related chronic and non-communicable diseases are determined. Regulations, guidance documents on implementation of the state policy in the field of healthy lifestyle and nutrition, disease prevention are developed and implemented. Experience of healthy lifestyle base stations at the municipal level is shown; legal framework for improving the preventive work in health care organizations has been prepared, besides there was carried out the work on the organization of the health centers.

Keywords: the doctrine of a healthy lifestyle, nutrition culture, healthy eating, disease prevention, health centers.

INTRODUCTION

It is known that annually more than 1 million people, of them about 100 thousand people of working-age die of cardiovascular diseases in the world. Cardiovascular diseases are the main cause of disabled people. At the same time, according to WHO data, 10% of health of the population depends on health system, 20% health of people depends on hereditary and biological factors, 70% on living being conditions of a person includingphysical activity, addictions, smoking and abuse of alcohol.First of all, health of a person depends on food stereotype. According to various authors, primary and general incidence annually grows for 5-7%, the number of functional violations and chronic diseases increases, especially, among children of school age, mental and reproductive health worsens. The following interrelation of mortality with major factors of risk is revealed: smoking – 17,1%, overweight – 12,5%, alcohol abuse – 11,9%, unbalanced food – 12,9% [4].

Considering the difficult demographic situation which is developed today in Russia, the state policy is directed on changing the situation, to increase duration and to increase quality of life, to form principles of healthy lifestyle and food and by that to carry out timely prevention of diseases for health protection of the population.

For long time the health system has been focused mainly on treatment of sick people, today the special attention is paid to health protection of the healthy. Since January 1, 2006 the Health project started, it comprising the category "the national priority project". The main objective of the project was improvement of health care and setting the stages for its subsequent modernization. Within implementation of the national Health project three main directions are allocated: increase of priority of primary medical and sanitary help, strengthening of health care preventive trend, increasing hi-tech medical care capabilities [2]. Because healthy lifestyle is the key parameter determining health state of the nation and each person separately, focusing on prevention activities, the Government of the country made the decision on establishing the Centers of health.

On August 19, 2009 the Order of the Ministry of Health and Social Development of the Russian Federation No. 597n "About the organization of activity of the centers of health for formation of healthy lifestyle at citizens of the Russian Federation, including reduction of consumption of alcohol and tobacco" was adopted. In 2009 502 Centers of health in 83 subjects of the federation were founded in order to implement activities directed on healthy lifestyle propaganda among the population including promotion of culture and skills of healthy food, thereby decreasing incidences and most widespread mortality rates [1]. However, despite positive tendencies in nutrition of the population, chronic diseases mortality, which development substantially connected with an alimentary factor, remains much higher, than in the majority of the European countries. Food of the majority of adult population doesn't correspond to the principles of healthy food because of consumption of foodstuff containing a large amount of fat of animal origin and simple carbohydrates, lack of vegetables and fruit diet, fish and seafood that leads to overweight and obesity which prevalence for the last 8 — 9 years increased from 19% up to 23%, increasing risk of development of diabetes, diseases of cardiovascular system and other frustration [3].

The considerable part of children and teenagers in house conditions and organized establishments, and also the working population in working hours, especially concerning small and medium-sized enterprises, for a number of reasons are deprived of opportunity to eat correctly and safely that adversely affects on their health.

All this testifies to need of development of the programs directed on optimization of food of various groups of the population including – carrying out preventive measures.

Therefore, the Governments of the Russian Federation of 25.10.2010 the order No. 1873 approved "Bases of state policy of the Russian Federation in the field of healthy food of the population for the period till 2020", according to which definite purposes and problems of promotion of the principles of healthy food and carrying out scheduled maintenance through the Centers of health.

For all years of thepreventive service activities in the republic, Ministry of Health prepared standard and legal base, the network of service of medical prevention in all municipalities (the centers of medical prevention, departments, offices) is created, the foreground directions of arrangements are defined, methodological and methodical work in interaction with the scientific and educational organizations is adjusted, work at the different levels, including mass media propaganda. In recent years work on creation and organization of the activity of the Health centers has been realized actively.

Today in the republic at 9 medical organizations of the republic there are 5 stationary and 6 mobile centers of health, including 2 health centers for children. Activity of the centers of health is included in the Territorial program of Fund of obligatory medical insurance.

The main functions of these Centers of health is informing the population about harmful and hazardous factors to health of a person, including a food factor forming food security, epidemiological, hygienic and clinical value of food for health of the population; group and individual promotion of healthy lifestyle and food, prevention of developing various diseases and formation of responsible attitude towards healthat the population and health of the children; training of the population in hygienic and psychological skills, including inurement of adequate food behavior; training of the population with effective methods of disease prevention in accordance with age; dynamic supervision over risk groupswithalimentary related diseases and noninfectious diseases; assessment of functional and adaptive reserves of an organism in accordance with age, the forecast of a state of health; consultation on health prophylaxis and protection, including physical activity recommendations , exercises and sport, sleep mode, living conditions, work (study) and rest, and mainly, recommendations about food correction; development of the

individual program for maintaining healthy lifestyle and food, subject to physiological features of children's age; implementation of monitoring of activities for formation of healthy lifestyle, risk factors of particular diseases.

Preventive activity of the Center of health is carried out in three directions: scheduled maintenance with the population, methodical work in establishment and coordination of the work in the territory. Preventive maintenance with the population is the main task of the Center of health being realized by means of carrying out year-round screening of the population for identification of patients with dangerous diseases. The efficiency of carrying out the prevention activities at the population is traced regularly. The database of results for further inspections is created. Hygienic education via information field including instructions, posters, brochures, booklets, lectures, conversations and other methods is carried out. Methodical work in establishments comprises training of health care workers in methods of assessment and correction of risk, individual and group consultation; assessment of volume and quality of preventive maintenance in medical institutions; introduction of new forms and methods of preventive services; health protection of health care workers; drawing up annual reports. Coordination work in the territory includes interaction with offices (offices) of medical prevention, others medical and not medical institutions on development and implementation of preventive programs; distribution of methodical materials; cooperation with the center of health in carrying out mass health promotion campaigns.

Taking into account the climatic and geographic features of the region and a traditional way of life of the population in territories with extreme conditions, the significant role is given to mobile medical work on the basis of the centers of health. For the purpose of improvement of quality and availability of rendering the out-patient and polyclinic help to the population the mobile centers of health of medical institutions of the republic attend all municipalities of the republic, up to the most remote settlements. Rendering the medical-preventive help has interdepartmental integration approach, putting constructive work with mass media, educational bodies, youth and public organizations, establishing priorities on a family, labor collective and educational organizations (children's garden-school-averages and higher educational institutions).

The mobile Centers of health are completely equipped with the modern diagnostic equipment, teams of health workers have opportunity to conduct complex medical examination which includes: measurement of height and weight; testing on a level of psychophysiological and somatic health of functional and adaptive reserves of an organism by means of complex software for screening assessment; a computer controlled heart screening equipment, which implements express assessment of heart state on electrocardiogram signals from extremities; angiologic screening with automatic measurement of systolic pressure and calculation of ancle-brachial index; express analysis of general cholesterol and glucose in blood; complex detailed assessment of respiratory system (a computer-controlled lung test equipment); examination of a doctor. For detecting additional risk factorswhich aren't included into the list of complex inspection on the installed equipment the following procedure are recommendedfor carrying out the researches: bio-impedance testing; carboxyhemoglobin analysis; cotinine and other biological markers in biological environments of an organism; pulse oxymetry; examination of a dentist - hygienist.

On the basis of testing resultson the computer controlled complex a doctor conducts examinations of citizens, including children (parents of a child or other representatives): assessment of the most probable risk factors, functional and adaptive reserves of an organism in accordance with age; forecast of health state; reads lectures on healthy lifestyle and food; makes individual programs on healthy lifestyle and food. If necessary he recommends dynamic supervision in the Center of health with carrying out thorough researches according to the revealed risk factors or supervision in offices of medical prevention and organizations, attending classes in schools, medical and

sports clinics with the programs elaborated in the Centers of health. Citizens withsymptoms of diseases identified or who need supervision in an office of medical prevention (in an office of healthy child), from their consent are transferred to an office of medical prevention (in an office of healthy child), to a therapist to the district police officer (to the pediatrician local) in a residence of the citizen (in an attachment place) respectively. In this case, the Center of health carries out interaction with offices of medical prevention, offices of the healthy child of the medical organizations for a residence of the citizen, concerning realization of preventive measures.

Table 1

Mobile work coverage of the population by the Centers of Health, in %

	2011.	2012	2013	2014 (8 months)
Mobile work coverage of the population, in %	5328	11187	18974	11702
	49,1 number of all addressed	44,3	56,8	58,3
• In districts	1768	5034	10032	6618
	33,2 from the general coverage of departures	44,9	52,8	56,5
• In enterprises	3560	6153	8942	5084
Number of the covered areas including:	9	22	30	21
			103 (settlement)	74 (settlements)
• Northern and Arctic areas	0	6	15	5
			31 (settlement)	12 (settlements)

In 2012 the mobile work of the Centers of health captured 22 districts of the republic, in 2013 – 30, in 8 months 2014 - 21 districts of the republic (these are 74 settlements). In 8 months 2014 17 441 persons addressed to the centers of health of the republic, 4 132 of them - children. In 5 northern and the Arctic areas (12 settlements), 6618 people, including 1597 children (tab. 1) are examined.

From among the examined 20% were almost healthy, at 80% risk factors of developing of chronic noninfectious diseases (tab. 2) were revealed.

Table 2

Structure of risk factors ofchronic noninfectious diseases among adult population, in %

	Risk factors of	2013	2014 (8 months)
.	Heterotonia	30,2	29,6
.	Change of level of cholesterol	18,3	17,9
.	Overweight	27,9	28,8
.	Low physical activity	28,6	28,2
.	Irrational food	33,5	33,7
.	Smoking	31,9	30,2
.	Increased intraocular pressure	14,9	14,9

In comparison with 2013 in 2014 the number of smoking people decreased by 1,7%, with low arterial pressure - for 0,52%, with low physical activity - for 0,4%, with high content of cholesterol in blood - for 0,35%.

The comparative analysis of results of complex inspection showed unsatisfactory threpsology status of children and teenagers living in city and rural areas of the republic. We revealed absolutely only 17,3%, healthy children in the city, 8,7 % in the village respectively that showed the low level of health among rural children. The unsatisfactory threpsology status of children show results of measurements of body composition where the higher prevalence is noted among rural children, almost every third child in the village had malformations of body composition (tab. 3).

Table 3

Structure of risk factors among children and teenagers in абс., %

Risk factors	City (n =3135)		Village (n = 960)	
	Abs. number	%	Abs. number	%
Low growth	331	10,5	135	14,0
High growth	526	16,7	166	17,0
Excess of body weight	351	11,1	117	12,1
Deficiency of body weight	111	3,5	82	8,2
Increase AP	159	5,1	18	1,8
Decrease AP	32	1,0	8	0,8
Cardiovascular system disorder	676	21,5	144	15,0
Increase of sugar in blood	258	8,2	28	2,9
Increase of cholesterol	234	7,4	24	2,5
Increase of carbon dioxide	561	17,8	60	6,2
Need of sanitation of oral cavity	1152	36,7	457	47,6
Uneasiness	554	17,6	137	14,2
Violation of structure of a body	668	21,3	287	29,8
Decrease in lung capacity	756	24,1	117	12,1
Decrease in oxygen saturation	10	0,3	7	0,7
Absolutely healthy	544	17,3	84	8,7

In four years of work of the Center of health 113341 persons were examined, including 54933 people examined by the mobile group. The demand of work of the centers of health annually grows.

It has become traditional to conduct republicanarrangementsdevoted to the World no tobacco day (on May 31), to the International Day of smoking refusal (on November 18), to National Day of health (February), to the World Health Day (on April 7), to the International Day of fight against abuse of drugs and drug trafficking (June).

In 2015 campaigns on the World day of consumer protection and the World Health Day are devoted to healthy food. Within the World day of consumer protection "Week of healthy food in the republic" is held, and the section "Correct Food Basis of Health" is carried out within the republican forum "Way to Active Longevity" devoted to the World Health Day in April, 2015. These days all republican, city medical organizations and the central regional hospitals carried out Fairs of health, the Exhibition of foodstuff, Competition of catering establishments and trade grocery divisions, Youth campaigns, Master classes "Control of weight", were conducted sociological surveys of the population, "Schools of health" worked. There were traditional republican, city, district campaigns, "Fairs of health", Open Days, conferences, seminars, master classes, round tables, health landings, class hours at schools, student's conferences in average special educational institutions, higher education institutions, distribution of promotional and informational materials: booklets, posters, publicizing of campaigns of decade and promotion of healthy lifestyle and food in republican, the ruraland city mass media.

In total health workers of the republic during the first half of the year 2014 organized 97 mass health promotion arrangements, with coverage 15 244 persons, 6479 of them being children (tab. 4).

Table 4

The name of campaigns	Number of campaigns	Coverage of the population	Children 1-18 years of the total sum
Film-video	68	3487	1780
Press conferences and round tables	10	165	
Thematicpartiesandexhibitions	2	1524	509
Competitions and quizzes	2	73	
Telephone hotline			
Landings of health	11	3526	728
Fairs of health	5	2146	597
Improving stocks	5	4257	2865
Sports arrangements	2	21	
Open Days	1	45	
Only	106	15244	6479

The annual interregional information and health promotion campaign "Health Wave" in 2015 is carried out for the third time. The campaign will be organized by Ministry of Health of the Republic of Sakha (Yakutia) and the Republican center of medical prevention. Highly qualified specialists from different Russian regions, employees from various republican ministries and departments, scientific and educational federal institutions, health workers of city and republican treatment-and-prophylactic institutions take part in this arrangement.

In 2013 the route of carrying out the Wave of health had in the following direction: Yakutsk – Pokrovsk – Olekminsk – Lensk – Yakutsk. 604 children were examined,86 childrenof them were recommended for further inspection and treatment . 22 reports, 11 master classes were delivered, 3 round tables were carried out. Motor vessel round of the Wave of health was followed by information in all mass media.

In 2014 the route of the Wave of health passed across two directions:

• Water tour campaign (Mikhail Svetlov motor ship): Yakutsk - the item Sangar - Vilyuysk – the village of Verkhnevilyuysk – Nyurba - Yakutsk

• Land round campaign (automobile): Yakutsk - the village of Berdigestyakh - Vilyuysk – the village of Sydybyl - the village of Verkhnevilyuysk – the village of Homustakh - the village of Haryyalakh - – the village of Suntar - Nyurba - Yakutsk

In total 3644 people were examined, including 2448 children, 1196 adults. 266 children were directed for additional inspection in out-patient clinics, 97 children for stationary treatment.

Except a medical component, the Campaign included an educational program. Scientific and practical and educational events, with participation of specialists of the federal medical centers, specialists of republican and city medical institutions, directed on prevention of socially important diseases are held. 35 reports, 6 master classes have been delivered, 8 round tables with coverage of 1055 people have been carried out. The main educational direction of the Campaign were widely presented with the purpose to promote healthy food and prevention of alimentary and dependent diseases, including, socially important and chronically noninfectious diseases.

Efficiency of any policy depends on support by the population, civil initiatives. In this aspect unique experience at the municipal level held in our republic is based on the district centers of health. There are 46 such settlements in the republicfor today. They set an example of work for formation of health saving behavior among the population, for introduction of healthy lifestyle among younger generation. A good tradition in the republic"Health landings"is carried out. The joint teams of doctors attend districts of the republic for carrying out medical examinations and rendering the practical help to the central regional hospitals. Positive responses of the population confirm about correctness of a choice of the directions of preventive maintenance.

Thus, the Republican center of medical prevention is the head and coordinating division of all preventive service in the republic. Through the network of divisions of medical prevention and the Centers of health of Ministry of Health of the Republic of Sakha (Yakutia) the mass health promotion work is carried out on formation of healthy lifestyle, including formation of skills of healthy food. Mobile forwarding consulting and diagnostic work on assessment of the actual food, the food status and health of the population is carried out. In the medical organizations the Schools of Health programs including the separate training courses "School of Healthy Food" and "School of Breastfeeding" "School on prevention of obesity", "School on prevention of chronic noninfectious diseases" for health workers and the population are introduced.

In general, such integration work on promotion of healthy food and prevention of diseases is carried out within the Agreement on mutual cooperation between the Republican center of medical prevention and the Center of food of scientific research institute of health of NHFV of M. K. Ammosov, adopted 05.04.2012.

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Development of Single Automated Nutrition Monitoring System in the Sakha Republic (Yakutia)

ABSTRACT

Taking into account the priorities of nutrition policy for the evaluation of actual nutrition following research samples were formed: pregnant women, nursing mothers, young children, pre-school and school age, various groups of the adult population. The results showed an irrational nature of the actual supply and inadequate eating behavior among different groups of the population of Yakutia and were the rationale for development of legal acts, policy documents, information, scientific, methodical and educational and training systems, including the development of creation of an automated system for nutrition monitoring of different groups of the population.

Keywords: monitoring of actual nutrition, automated system, information technology, single database

Influence of a complex of extreme climatic, socio-economic, environmental factors in the North is reflected in dynamic changes of adverse health status of different population groups. Climatic conditions and regional features have significant impact on the body's needs for nutrient and energy.

Poor nutrition of different groups of population of the Republic of Sakha and its proven relationship with deficient states and alimentary-dependent diseases, ill-defined policy priorities in the field of healthy nutrition of population in the Republic, poor quality assurance and food safety, as well as the lack of concrete measures to prevent the supply on the consumer market substandard and dangerous food products and their turnover on it showed the need for a well-functioning system of monitoring implementation, including the collection, storage, processing and dissemination of the data received.

In this connection, a group of scientists and programmers decided to form a team of developers to create a system for nutrition monitoring in the Republic favorable for optimizing the structure of nutrition and prevention of alimentary diseases.

The aim of monitoring is a distribution of a system for improving of nutrition to all social institutions (educational, health care, social development etc.), formation of a common data base to reflect objectively the condition of all catering system in the Republic and the dynamics of its development.

To achieve this purpose we had to create a unified methodology of monitoring; developed digital system of nutrition monitoring in the regions of Yakutia; conducted training seminars on introduction of monitoring; conducted regular consultations and methodical assistance and technical support of the regions of the Republic; made data collection and analyses on the implementation of measures to improve catering services; promoted internship sites. Therefore we created special web-portal.

Using digital system of management, given data are analyzed on further directions: health condition; characteristics of kitchen for their compliance with the requirements of sanitary rules and regulations, constructive

codes and regulations, as well as modern catering technologies; models of nutrition; characteristics of nutrition; availability of nutrition in accordance with the sanitary standards and regulations, catering organizers, pricing, cost, subsidies for catering from the budgets of all levels and extra-budgetary sources; system of electronic cashless payments (in the calculation of basic and supplementary nutrition); researching mass opinion on nutrition; promotion of a healthy diet, conducting control over quality and safety of products; implementation of regional and municipal programs on improving nutrition; training, retraining and skills development, work of internship sites, resource and other methodical and consulting centers for improving nutrition in institutions.

To estimate the actual nutrition the following methods are used: the balance method on the basis of a sample survey of household budgets; methods of retrospective nutrition playback - analysis of the frequency of food consumption and a 24-hour food recall; statistical techniques - menu-layout analysis. The research takes into account the diets of people living in environmentally disadvantaged areas. They should be drawn up and adjusted not only in line with the principles of sustainable, balanced diet, but also taking into account the increased demand in a number of nutrients that provide non-specific resistance and implementing mechanisms of nutritional adaptation to the impacts of priority pollutants facilities habitat in the area. For example, enrichment rations with a number of nutrients is important for nutritional regulation of metabolism of xenobiotics priority (lead and cadmium) direct anti-toxic effect (dietary fiber, calcium, iodine, zinc, vitamin C, group B, β-carotene). Also, the disruption of the structure of nutrition for pregnant women and nursing mothers requires the formation of a strategy to eliminate imbalances in the diet, development of a system for monitoring the level of provision of these groups with the main macro and micronutrients and implementation of appropriate preventive technologies correcting nutritional profile. Analysis of diets of workers employed in hazardous conditions of work, shows the need for the development of medical and preventive measures of alimentary-dependent diseases based on evidence-based approaches and modern technologies of catering and nutrition correction, as well as features of the toxic load of production, that is - the development and implementation of the system of nutritional prevention and diet therapy for operating companies in order to reduce general and occupational morbidity and mortality. To carry out a correct evaluation of the relationship with health food it’s necessary to conduct organization and monitoring of actual diet and nutritional status on standardized procedures using common criteria and approaches, as well as to create conditions for inter-agency cooperation in the exchange and analysis of information. This trend can be seen in the future as part of socially-hygienic monitoring, as part of monitoring the quality, food safety and public health.

In recent years the policy of the President and the Government of the Republic of Sakha supports innovative biotech projects in the field of improvement life level of the population, especially among children and adolescents and youth. According to the Russian Law "On education" (Article 32, 51) the organizer of education is required to obtain the material conditions of the training process, including - the organization of nutrition of students in accordance with the Sanitary rules and regulations. According to them, on the basis of medical and hygienic regional assessment of actual nutrition and dietary habits among children and adolescents in educational institutions of the Republic of Sakha (Yakutia), there were developed unified diets - menu with the inclusion of food products from local raw materials. Calculation of power was held on an information system based on the decisions of line "1C: Planned nutrition", a unified menu is approved by the Office of Rospotrebnadzor for the Republic of Sakha (Yakutia), in August 2013, adopted by the Resolution of District administration of Yakutsk.

The line of "1C: Planned nutrition" consists of computer programs and information products for the collective management of nutritional department in educational institutions, health care, social protection (kindergartens, schools, hospitals, health centers, health camps), as well as in other cases, when the catering is

organized routinely , with the preparation of a typical menu that corresponds to norms of consumption (in natural product groups, indicators of nutritional value, value): "1C: Preschool Nutrition", "1C: School Nutrition", "1C: School Canteen", "1C: Planned Food Plant "," 1C: Medicine. Dietary Nutrition", "Rezepturnik (version 3) "" Evaluation of Nutrition - Nutritest". These programs contain calculation, accounting products and nutritional calculations for industrial or small food suppliers to many nutrition units; electronic collections of recipes and sample menus. The format of presentation includes the entire set of technological and nutriologic information about dishes, foods menu. Complete information and software packages for viewing and downloading in a ration system designed for everyday calculations are available on distribution channels of the company "1C".

When publishing a new "Sanitary Rules" (thereafter SanPiN) and other official documents regulating the social catering, the developers make changes to the program. SanPiN-2409 adopted in 2008 on school nutrition contained new forms routing, sample menu, diet sheets analysis, journal of defective production. The program models have been added to output forms (reports themselves were in the program before). Adopted in 2010 SanPin-2660 for pre-school contains the recommended form of a sample menu, routing, grading. Models of output forms have been added into the program, previously existing have been abandoned due to the wishes of users and the formal nature of the changes.

All the substantive requirements of SanPiN according to requirements of standard menu, recipes approval, the order of drawing up menus, control technology have been incorporated in the design of the program (before the adoption of SanPiN), therefore these provisions do not require software updates.

According to wishes of the users, not confirmed by official sources, there is currently being prepared a new edition of SanPin on school nutrition. A new release is planned after the approval of the document.

Not only SanPiN, but other official documents of "Instruction on Budget Accounting" (approved by the Ministry of Finance), "Rules of service of catering" (approved by the Government of the Russian Federation) reflect the composition of the program. Typical forms of primary accounting documents are approved by the State Statistics Committee. Regional guidelines on nutrition are taken into account in approving the program of the state administration authority or supervision. Other requirements are implemented as a complement, as development and connection of new external reports and data processors are included in the delivery.

Updates of "1C" configuration are available to all users with a valid subscription to information and technological support: automatically on the site "1C"; through partners of the company "1C", providing services to information technology support; by user himself (rarely used).

To ensure nutritional calculations in the program, characteristics of nutritional value of foods, dishes and menu structure can be supplemented and modified. It's actually possible when you change the composition of nutrients in the form of new SanPiN. The database contains information on the nutrient composition of an expanded, even on unused at this time characteristics. The user can also add a nutrient and then enter values for it to all products.

There are some plans to develop. For example, a "Module "Nutrition" (for" Government Accountants') "-means free nutritional calculations for the accountants performing the work and practical nutritionist for the development, calculation and design of the menu. Work of storekeeper without reference to a desktop computer is supported by software "MobiSellAppa" for smart phones and tablets on Android, sharing via web services with "1C: School meals" and others.

Sharing with "1C: Accounting" by means of "Universal treatment upload / download" and exchange is planned to expand by including sharing plans. Transfer to the new version of the platform "1C: Enterprise" and "

Library of Standard subsystems" that will provide work in service mode technology "1C: Fresh" is being planned. The elaboration of "Monitoring of social nutrition," is started which is planned as a runner solution for regional governments or district level, providing them with operational information across the network subordinate kitchens, with the variable composition of controlled characteristics. In addition to “Bulletin board”, the system is designed to detect anomalies (deviations from the normal) for the operational management decisions. For efficient data acquisition while minimizing labor costs there will be provided a mechanism to automatically obtain information on the system "1C: School Nutrition."

In the process of organizing the nutrition of children and adolescents in educational institutions and other social institutions, there are used a huge number of different documents. To improve staff efficiency, reduce the press on specialists and prevent errors, most documents can and should be conducted in electronic form. But the main condition for the proper documentation in electronic form is to standardize documentation in form and content.

Here is an incomplete list of documentation on nutrition of students and pupils, which is available and/or conducted in the nutrition unit, in the kitchen plant – providing feeding of a company (hereinafter – PFC), or in an educational institution, and the availability and/or maintaining of which is advised to conduct electronically: regulatory and guidance documents; technical documents for products of nutrition; standards (GOST) and specifications for purchased products; diets and menus – standard; Documentation on budgetary accounting, including menu-demand (Form OKUD 0,504,202) and cumulative list of product flow (form OKUD 0,504,037); Documents quantifying food, raw materials, and so on; information about the presence of the Documents confirming the quality and safety on the obtained (purchased) food products, materials, machinery, equipment, detergents and disinfectants; Documents in the system of production control and quality management of products (services), including the results of monitoring logs; Documents with information for consumers, including a daily menu.

It requires some explanation. First, about the possibility of conducting all the listed documents in electronic form in normative legal acts, as a rule, there are no permitting or prohibiting provisions. However, considering that the practice of electronic document has not yet been sufficiently disseminated, advocacy efforts are needed with representatives of the regulatory and supervisory authorities in the field for the possibility and expediency. Another question that is not resolved in the work of most kitchens - is to ensure qualified acceptance of the quality of incoming raw materials and finished products. The most important condition for this is the fact that those who are responsible for the acceptance of goods, should access information on existing quality requirements of all kinds of goods - in the form of a library of national standards and technical specifications for all types of products. Unfortunately, the manufacturers that produce the products according to technical specifications (TS) or standards organization (SO) are often reluctant to provide these documents to consumers of their products. Meanwhile, in the case of purchase of goods for the needs of the organized nutrition of social institutions, manufacturers are required to provide information on the quality of supplied products, this is requirement for such supplies. An alternative case is to place the TS (SO) on the official website of the manufacturer - the practice, unfortunately, has not yet received sufficient distribution.

Another important condition for electronic document management system of preschool and school nutrition is the ability to transfer data electronically. This is impossible without standardization of requirements for the format of documentation in electronic form. A common practice is to standardize a single file requirements for export and import and transfer of information (usually - a file of format XML). As a good example of such a format can be developed and used data format "Retsepturnik" which is used in the line of decisions "1C: Planned nutrition". It should be noted that the statement of requirements for the unified design of the menu, flow charts and other

documents are designed not only to make document management easier. It is also a necessary condition to guarantee the absence of errors, a common understanding of the requirements for menus and diet, the nomenclature of the products used. A very important condition for the proper conduct of the documents is unified indicating the name of food used in nutrition.

Analysis of the documents in the pre-school and school nutrition has shown that many problems are caused by lack of common terminology applied to the names of food products, when the same names are understood differently by different participants in the organization of supply.

Thus, there is an obvious need to introduce unified classification of food for nutrition of children and adolescents and the formation of a single product line, containing accurate and convenient names for practical use of them.

To solve this problem, the authors of the publication have created classification of food products, as well as they have compiled contributed unified product line (hereinafter - UPL) for the organization of nutrition in educational institutions, and other social institutions.

UPL is a systematized, replenished, convenient from a practical point of view, list of names of food products intended for the formation of diets of children and adolescents. This nomenclature conditionally awarded to each type of food: permanent full name, corresponding short trade sign, numerical sign (Code). The range allows identifying food product, to specify product names consistently in compiling menus and to develop technological charts for the products; it allows you to organize accounting products using the computer, which meets the requirements of the legislation on public procurement.

To specify brands and ordering information on manufacturers of food products included in the UPL, there was created "List of food for nutrition of children and adolescents", which is currently conducted under “Scientific and Research Institute of Baby Nutrition” using the developed by the participation of the authors of the publication information system for processing and storage of data on the food (computer program registration № 2010615918).

Therefore, standardization of regular, technical documentation and nutritional information in electronic form of the nutrition in social institutions in the Republic of Sakha (Yakutia) and the integration of used in this automated information systems with databases on food and nutrition, ensure compliance with all requirements of nutrition - as a hygienic, as economical.

A unified automated system for monitoring of nutrition, which will include all above mentioned parameters and characteristics, will make the work of the nutrition organizers more efficient, and give the best possible prospects of providing quality food safety for the health of the population.

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The Role of Modern Medical and Organizational Technologies in Increasing of Breastfeeding Duration

ABSTRACT

Evaluation of the introduction of modern principles for protection and supporting breastfeeding in practice of maternityand childhood hospitals has been done. Women with infants (12-36 months) were interviewed, in children's clinics, with or without the title of theWHO / UNICEF «Baby Friendly Hospital» (BFH and NBFH). The results showed that in clinics, introducing modern principles of the protection and support of breastfeeding and having the title of the BFH, the average duration of breastfeeding and the proportion of children exclusively breastfed

up to 6 months were more than in NBFH clinics. The conducted dispensary analysis confirmed the impact of medical - organizational factors on breastfeeding. The study confirmed the importance of modern protection and support technology of breastfeeding to increase its duration.

Keywords: breastfeeding, exclusive breastfeeding, duration and prevalence of breastfeeding, the initiative «Baby Friendly Hospital».

Breastfeeding remains a perfect kind of feeding, capable to provide harmonious development of a child adequate condition of their health. Breastfeeding is the best way ofgranting ideal feeding for healthy growth and development of babies, it is also animportant component for reproductive process with important consequences for women'shealth.

However in Russia, as well as in many other industrial countries, for the last decades low duration of breastfeeding has been marked. In this connection search ofoptimal ways for increasing the breastfeeding prevalence and duration, including duration of exclusive breastfeeding is of great importance.

Contemporary principles of successful breastfeeding cover activities on training medical staff as well as pregnant women, providing conditions for early breastfeeding and rooming-in in maternity hospitals, breastfeeding on newborns' demand, exclusivebreastfeeding since birth, refusal of dummies and bottles, supportingmothers after discharge. All these principles as 10 steps of successful breastfeeding are reflected in the WHO/UNICEF Baby-Friendly Hospital Initiative (BFHI) that wasdeclared in 1991. Later these principles have been adapted in the different countries and on other health facilities concerning health care for mothers and their babies.

In Russia BFHI has been implemented and developed since 1996. The Initiative has been engaged in the maternity hospitals children's out-patient polyclinics and women consultations (for pregnant women) as well since 2003. For January 1st, 2015 year 295 maternity hospitals in 51 subjects of the Russian Federation have been designated as Baby Friendly. About 21 % of the annual number of births isaccepted in these hospitals. Women consultations and children's out-patient polyclinics take part in the BFHI also, from them 151 and 194 health facilities accordingly are certified.

The aim of this research is to describe results of the implementation of contemporary principles for protection and support of breastfeeding in the practice of maternal and the child health facilities.

MATERIALS AND METHODS

The sociological research has been conducted. Mothers with babies of early age - 12-24 months have been interviewed. Questionnaire contained 63 questions divided into 4 blocks: the social characteristic of afamily; state of mother's health and their obstetrical anamnesis, state of infant's health at birth, character of infants' feeding since birth andadditional information concerning breastfeeding. The researches were conducted in 8 children's out-patient polyclinics, four of which have been designated as Baby Friendly: Electrostal, Rostov-na-Donu, Yuzhno-Sakhalinsk, Belebei and Tuimazy in Republic Bashkiria (BF). Others 4 children's out-patient polyclinics did not pass certification and were not involved(NBF): Stupino, Fryazino(Moscow Region) and 2 facilities in Ufa, Republic Bashkiria.

Considering that mother support groups are actively developed in Russia [1], we also interviewed mothers having children in the age of 12-36 months visited such group in Stupino - Moscow Regional Mother's Support Group "League of Young Mothers of Moscow Region" (League). This NGO has been created by the participation and support of administration of the city for the purpose to support of the families with the infants and young babies. One of directions of the work of League is breastfeeding protection and support according to the 10 steps of the BFHI.

In total 911 mothers have been interviewed, of them 494 mothers in the BF out-patient children's polyclinics (1 group), 368 - in the NBF out-patient children's polyclinics (2 group), and 49 - visited League (3).

Statistical processing of the material was carried out with use of the statistical package SPSS.17 for a personal computer. For revealing interrelation between duration of breastfeeding both studied social, medical and organizational factors the one-factorial dispersive analysis was carried out.

RESULTS AND DISCISSION

Results have shown, that social characteristics of the respondents and their families in all groups had no essential distinctions on the majority of studied parameters. Middle age of the mothers was 27,0-29,0 and fathers - 28,0-32,0 years. A significant part of the mothers had a special - 25,0-50,0 % or higher education - 16,0-50,0 %, except for mothers from 3-d group (League) where the majority of mothers were with the higher education - 97,0 %. Also fathers had a high educational level also: special - 20,0-50,0 % and the higher education - 25,0-50,0 %. The average number of the children in the family 1,3-1,6. At the majority of the families was one - 50,0-70,0 % or two children - 30,0-40,0 %. About 80,0-90,0 % of mothers from 1-st and 2-nd groups did not work. Not worked mothers in 3-rd group was less - 46,0 %, it is obvious in connection with that this group included mothers with children with more age.

Obstetrical anamnesis of the respondents and state of their child health at birth had no essential distinctions in all 3 groups. The majority of them were registered on pregnancy in the recommended terms, till 12 weeks - 80,0-90,0 % (League - 70,0 %); visited training groups for the pregnant women on preparation for the births, including questions of the breastfeeding- 25,0-80,0 % (League - 70,0 %). The prevalence of cesarean section like a kind of delivery was 8,0 15,0 % (League - 20,0 %). The prevalence of premature infants and infants with low weight at birth was insignificant 0-5 % in both groups (League - 0 %).

The practice of maternity hospitals on protection and support of breastfeeding was characterized by uniformity and had no essential distinctions in 3 groups of the mothers. Early breastfeeding after birth took place in 45,0-93,0 % (League - 50,0 %), however duration of skin-to-skin contact 30 minutes and more took place only in 3,0 %-30,0 % (League - 11,0 %). Rooming-in took place in 9,0-90,0 % of cases (League - 40,0 %). The first breastfeeding after the translation mothers from a delivery room was carried out in 1-2 hours in 3,0-60,0 % of cases,

and in 12 hours and more - in 10,0-55,0 % (League - 34,0 %). In a significant number of cases the medical staff assisted mothers in attaching a baby to breast - 60,0-90,0 % (League - 57,0 %). 9,0-45,0 % of infants received bottle feedingin the maternity hospital (League - 57,0 %), about 3,0-40,5 % of mothers have answered that they did not know whether bottlesand dummies had been used for feeding and drinking their babies (League - 0 %), that is obviously connected with separate stay of a mother and a child. Pacifiers were used only in 3,0-20,0 % of cases (League - 11,0 %), however 3,0-60,0 % of mothers did not know how to use pacifiers in cases of separate stay (League - 30,0 %). In some of maternity hospitals there were cracked nipples among the mothers - 10,0-20,0 % (League (26,0 %) and breast engorgement - 5,0-40,0 % (League - 20,0 %), that is connected with wrong techniques of breast attachment. Average duration of stay in maternity hospitalswas 5-6 days (League - 3) and varied from 6 till 18 days (League - 3-8 days).

Practice of breastfeeding after discharge of maternity hospitals was characterized by the following parameters. The majority of mothers have been adjusted on breast feeding and considered breastfeeding as necessary for health and development of a child(90,0-100,0 %). In their opinion, duration of natural breastfeeding should be not less than 12 months - 85,0-100,0 %. A greater number of the women from 1-st group - 20,0-45,0 % plan long breastfeeding 2 years and more according to recommendations the WHOin comparison with 2-nd group - 4,0-30,0 % (League - 49,0 %). The duration of exclusivebreastfeeding is considered to last 6 months - 50,0-80,0 % of mothers of both groups (League - 57,0 %).

Some distinctions in answers of 3rd group mothers to questions concerning the key principles of successful breastfeeding should be noted. Feeding on demand of a baby was kept by the majority of mothers - 90,0-100,0 % from 1-st group and 80,0-97,0 % from 2-nd group (League - 94,0 %), almost all of mothers from three groups nursed theirbabies at night - 95,0-100,0 %. Used pacifiers35,0-60,0 % of mothers of the 1-st group and 60,0-70,0 % from the 2-nd group (League - 20,0 %); to drink their babies the first 6 months by the water or tea 10,0-30,0 % and 30,0-40,0 %, and used bottles and dummies 15,0-40,0 % and 16,0 %-70,0 % mothers accordingly from 1-st and 2-nd groups (League - 6,0 and 17,0 %).

Among the main reasons of breastfeeding cessation the 1-st and 2-nd group mothers named such reasons as shortage of chest milk of 9,0-47,0 % and 19,0-53,0 %; itself has solved on age of the child - 16,0-32,0 % and 15,0-49,0 %; problems with the breasts - 0-2,0 % and 0-6,0 % accordingly (League - 0; 40,0 and 0 %). More often mothers from 1-st group in comparison with mothers from 2-nd group named such reasons, as come back to work - 9,0 -23,0 % and 2,0-5,0 %; illness of mothers - 4,0-19,0 % and 3,0-7,0 %; getting tired to nurse - 4,0-14,0 % and 0-6,0 %; illness of a child - 0-4,0 % and 0-1,5 % accordingly (League - 9,0; 3,0; 14,0 and 3,0 %). About identical number of mothers from both groups have stopped to nurse for the reason that a child himself disengaged from breast feeding - 6,0-16,0 % and 4,0-15,0 % accordingly (League - 31,0 %).

Mothers in the 1-st and 2-nd groups estimated highly the help of medical staff in support of breastfeeding - 50,0-80,0 %. Also they assess the help of members of their families - 60,0-90,0 %. The mothers from Leaguenoted insufficient help of medical staff- only 3,0 % of mothers have gave positive estimation, preferring the help ofmembers of their families - 70,0 %, and also their girlfriends - 48,0 %.

Sources of information concerning breastfeeding. No essential distinctions in answers of mothers of 2 groups were revealed. The most widespread sources of the information for these mothers are medical staff ofchildren's polyclinics - 80,0-100,0 %; maternity hospitals - 30,0-90,0 % and women's consultations - 5,0-60,0 %. A significant part of mothers receive the information on breastfeeding from their mothers 30,0-60,0 %; popular scientific literature - 35,0 -50,0 %; their breastfeeding girlfriends - 13,0-40,0 %; mothers-in-law - 6,0-40,0 %; in

mother support groups - 3,0-40,0 % and from mass media - 9,0-24,0 %. Only insignificant part of mothers have named sites in the Internet as a source of the information - 2,0-8,0 %. Answers of the mothers from the League group substantially differed from answers of mothers of two other groups. They named the main sources of the information not medical staff but sites in the Internet - 100,0 %; mother support groups - 97,0 %, the popular scientific literature - 54,0 %; breastfeeding girlfriends - 34,0 % and their mothers - 17,0 %.

The average duration of breastfeeding in the 1-st group was 7,7-14,7 months, and in 2-nd group - 7,7-12,6 months. In the three from for BF children's policlinics average duration of the breastfeeding were significantly high than in the NBF policlinics - 11,0-14,7 months ($p<0,01$). Average duration of breastfeeding among themothers from League was significantly higher than in BF and NBF polyclinics - 19,7 months ($p<0,001$).

Duration of breastfeeding recommended by WHO - 2 years and more with the appropriate supplement feeding after 6 months. A significant number of mothers in the 1-st group nursed till 1 year or 1,5 years. The mothers from League nursedeven longer.

Average duration of exclusivebreastfeeding is 4,4-5,8 months in BF out-patient children's polyclinics and 4,0-5,2 months in NBF out-patient children's polyclinics. The highest duration took place among the mothers of League - 6,0 months, they considerably exceeded the parameters other two groups ($p <0,01$).

Duration of exclusivebreastfeeding, recommended by WHO is 6 months, the Russian pediatrics recommend duration of exclusive breastfeeding in an interval 4-6 months. According to our research it was revealed, that the majority of children in both groups - 80,0-97,0 % (League - 100,0 %) were on exclusive breast feeding up to 3 months.Much less children were on exclusive breastfeeding up to 6 months: 1-st group - 40,0-80,0 % and 2-ndgroup - 20,0-60,0 % (League - 70,0 %). The higher prevalence rate of children who were on exclusive breastfeeding up to 6 months was noted in BF polyclinics and among mothers fromLeague in comparison with NBF polyclinics ($p <0,01$).

As a result of the dispersive statistical analysis it is revealed, that the duration of breastfeeding is mainly connected with a positive spirit of a woman on long feeding. Social factors ofthe duration of breastfeeding includea number of children in a family, age of a mother and a father, their education, and also mother's work. The more a number of children in a family or the higher a level of motherand father's education or the later mother comes to work,the longer the breastfeeding duration is noted.

Among medical and organizational factors positive influence on the duration of breastfeeding training of pregnant women, practice of maternity hospitals concerning breastfeeding support and promotion should be considered: early skin-to-skin contact and initiation of breastfeeding during the first hour after birth, rooming-in, feeding on the baby's demand. Also the positive interrelation between duration of breastfeeding and implementation of recommendations for successful breastfeeding after hospital discharge has been revealed: exclusivebreastfeeding in the first 6 months, breastfeeding on demand, including night feedings, and also refusal of dummies and bottles. Average duration of breastfeeding and exclusivebreastfeeding substantially depends on whether the children's polyclinic has status BFHand whether mothers visit mother support group (League). These parameters were higher in BF polyclinics and the highest among mothers from League.

Thus our research allowed to give the main characteristic of the practice for supporting breastfeeding support and promotion in maternity hospitals and out-patient children's policlinics designated and not designated as BF, to estimate the duration of breastfeeding and exclusivebreastfeeding in out-patient children's polyclinics among mothers visiting mother support groups.

Maternity hospitals play a key role for the successful breastfeeding from the birth; it especially concerns to

Russia as the majority of Russian women are initially adjusted on feeding by breast since maternity hospitals in comparison with women from other European countries - on the average 5-6 days. Not less than 92,0 % of Russian women start to nurse their babies in maternity hospitals [7].

The important role for support of breastfeeding mothers after their discharge from maternity hospital belongs to out-patient children's polyclinics. Implementation ofmodern technologies for protection and support of breastfeeding of the BFHI allows to organize and unify this work correctly. In our research average duration of breastfeeding in the BF out-patient children's polyclinics was characterized by high parameters in comparison with the NBF children's out-patient polyclinics. Among mothers of League the duration of breastfeeding was the highest one. In BF polyclinics and among mothers of League higher parameters of exclusivebreastfeeding in comparison with NBF polyclinics also were marked. Data of our research are comparable to data of the other authors. Duration of breastfeeding in various regions of Russia range from 5,0 up to 11,0 months, for example, in Nizhni Novgorod - 5,3; Kirov - 5,5; Republic Yakutia (Saha) - 6,8-8,4; Republic Ingushetia - 8,5-8,7 and in the Chechen Republic - 9,5-10,8 months [4-6, 3]. As a result of introduction of BFHI principles in the health facilities in Krasnoyarsk breastfeeding duration raised up to 9,9 and Republic Tyva - to 12,4-14,0 months [2].

The significance of medical and organizational factors implementing the modern health care facilities in the practice for increasing breastfeeding and exclusive breastfeeding duration has been established by the dispersive statistical analysis.

CONCLUSION

Duration of breastfeeding and exclusivebreastfeeding substantially depend on implementation of modern organizational principles for breastfeeding protection and support of the BFHI in the practice of the health care facilities for babies and their mothers, based on Initiative WHO/UNICEF “Hospital friendly to a child”.

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Modern State of Breastfeeding in Sakha Republic (Yakutia): Development Issues and Prospects

ABSTRACT

The analysis of indicators of breastfeeding per 2004-2013 according to statistics of the Ministry of Health of the Republic Sakha (Yakutia) on certain areas of medical and economic zoning of the Republic (the Arctic, agricultural and industrial) is carried out. Different levels of breastfeeding rates in dynamics for 10 years on separate territories are specified. The evaluation of the work of the «School of breastfeeding» in 35 municipalities is done and efficient sources of promoting and supporting breastfeeding are identified.

Keywords: breastfeeding, breastfeeding indicators levels, the school of breastfeeding, breast milk

INTRODUCTION

From the first months of life the optimal type of feeding for an infant is breastfeeding conforming with its digestive system and metabolism. In Russia, the number of breastfed infants is very low. According to official data of the Ministry of Health of Russia, in 2012 only 41.2% of infants receive breast milk at 4-6 months and 40.6%- at 6-12 months. More than 10% of mothers do not breastfeed their children after birth. Regretfully, insufficient information on breastfeeding values and advantages either of doctors, or of parents is of significance [6].

However, in recent years, some Russian regions witness a marked increase of the number of breastfeeding women. This is predominantly related to huge work on protection and support of breastfeeding conducted by scientists, health system workers and doctors; pediatricians, obstetricians, gynecologists, and nurses. The UNICEF and WHO activities in our country played a major role in initiation and implementation of this huge work [2].

MATERIALS AND METHODS

Data of annual statistical reports of medical institutions (treatment and care facilities) of the Sakha Republic (Yakutia), materials of the Territorial Body of the Federal Service for State Statistics in the Sakha Republic Federal State Enterprise “Central Research Institute for Organization and Informatization of Health Care of the Health Ministry”, reports of major data of mother and infant health in the Sakha Republic, 2004-2013 have been used. [3,4,5]

RESULTS

The fact that breastfeeding is useful either for an infant, or for a mother has currently become widely known and obvious, everything good in man is said “to have been drunk in with mother’s breast milk”. However, a question arises, if breastfeeding is the only process, why so many women have difficulties with it, do not breastfeed at all or do it for short time. Why breastfeeding of a healthy child in first half-year often make a dominant problem of a young family? [1].

During a decade, the statistics of the Territorial Body of the Federal Service for State Statistics in the Sakha Republic Federal State Enterprise “Central Research Institute for Organization and Informatization of Health Care

of the Health Ministry" show low levels of breastfeeding and a small number of breastfed infants in Sakha. Breastfed infants at the age of 3- 6 months made at an average 48.6%,, at 6- 12 months- 28.4%. In the age group 3-6 months, the biggest and smallest rates of breastfeeding have been identified in the Arctic, in the Bulunsky and Abyisky regions (58.2% and 40.7%, respectively) (Table.1), in the rural regions of Tattinsky and Kobyaisky (61.7% and 34.9%, respectively), in the industrial regions of Aldansky and Ust-Maisky (61.9% and 39.4%). In the age group 6- 12 months, these rates reduce almost 2-2.5 times and made in the Arctic 41.5% in the Verkhnekolymsky and 20% in the Abyisky regions (Table 2). In the rural zone, 35.4% of women in the Churapchinsky region breastfeed, while the lowest rates 22.5% are witnessed in the Gorny region

Table 1

	Breastfeeding levels among infants from 3 to 6 months, in % from the total number									
Regions	2004	2005	2006	2007	2008	2009	2010	2012	2013	M
Abyisky	38.9	44.9	42.6	45.1	41.0	43.4	43.7	39.5	26.6	40.7
Allaijkhovky	62.7	61.4	29.1	80.0	67.3	25.5	20.0	45.5	39.1	47.8
Anabarsky	42.2	71.7	61.1	26.5	59.7	48.6	77.8	59.7	50.0	55.3
Bulunsky	64.2	59.5	62.0	65.8	60.0	60.8	38.8	62.9	49.6	58.2
Verhknekolymsky	46.3	43.4	42.6	49.4	63.3	55.3	47.8	50.8	34.4	48.1
Verkhoyansky	55.4	46.7	60.5	75.9	36.4	43.5	61.2	39.0	57.2	52.9
Zhiganskyi	46.4	47.8	42.7	51.5	43.1	46.7	47.3	455	44.8	46.2
Momsky	41.1	70.3	41.7	39.4	31.1	30.8	43.5	66.0	18.4	42.5
Nizhne kolymsky	55.9	48.1	43.5	53.9	63.0	50.0	46.1	39.2	17.2	46.2
Oimyakonsky	46.3	29.5	62.1	42.7	46.3	36.1	55.6	57.6	27.7	44.9
Oleneksky	51.1	55.6	69.8	61.0	67.1	47.7	32.5	34.6	39.6	510
Srednekolymsky	53.2	53.9	62.8	48.3	57.8	54.2	37.2	25.8	19.4	45.9
Ust-Yansky	27.2	69.2	48.6	53.8	46.0	33.0	60.0	64.6	52.6	50.6
Even-Bytantaisky	37.0	41.3	38.9	100.0	50.0	50.0	51.6	18.4	14.5	44.6

Table 2

	Breastfeeding levels among infants from 6 to 12 months, in % from the total number									
Районы	2004	2005	2006	2007	2008	2009	2010	2012	2013	M
Abyisky	13.9	20.5	14.8	26.8	20.5	13.2	22.5	27.6	20.3	20.0
Allaikhovky	36.5	38.6	38.2	20.0	23.1	21.8	24.0	25.0	17.4	27.2
Anabarsky	30.1	18.5	38.9	27.7	40.3	21.6	22.2	24.2	25.0	27.6
Bulunsky	11.9	30.1	29.6	31.0	40.0	25.5	19.4	37.1	42.9	29.7
Verhknekolymsky	25.9	34.0	25.9	50.7	36.7	44.7	52.2	49.2	54.7	41.5
Verkhoyansky	29.7	26.2	31.8	14.4	20.7	35.4	30.0	43.1	32.9	29.4
Zhigansky	31.4	35.8	31.5	48.5	30.3	33.3	41.9	37.5	38.1	36.5
Momsky	15.5	25.2	32.3	52.1	62.2	61.5	31.5	25.5	55.1	40.1
Nizhne kolymsky	24.9	38.0	36.2	39.3	20.7	22.6	18.0	20.3	17.2	26.4
Oimyakonsky	17.1	18.7	22.3	31.6	3.7	34.0	26.2	37.6	9.2	22.7
Oleneksky	33.5	18.1	20.6	22.0	29.3	17.0	27.3	16.7	17.7	22.5
Srednekolymsky	17.7	21.4	25.6	32.9	38.3	25.9	26.3	12.5	10.9	23.5
Ust-Yansky	22.8	30.8	30.8	41.3	46.9	46.,6	30.9	29.2	24.1	33.7
Even-Bytantaisky	25.9	17.5	50.0	0.0	50,0	26,8	39.1	22.4	8.7	26.7

The analysis of breastfeeding rates in various age groups (0-3 months, 3-6 months, 6-12 months, 1-2 years, 2-3 years) revealed new parameters defining levels of breastfeeding in the Sakha Republic among infants from birth to 3 years of age. In 2014, the number of infants from birth to 3 years of age made 48511 persons. Out of them, 63.9% of infants at the age from 0 to 3 months were breastfed, 3-6 months – 49.3%, 6-12 months – 36.7%, 1- 2 years – 12.8%, 2-3 years – 6.5%.

Efficient work on support of high levels of breastfeeding is conducted in the Amginsky, Bulunsky, Kobyaisky, Megino-Kangalassky, Mirninsky, Neryungrinsky, Oleneksky, Tattinsky, Usr-Yansky, and Khangalassky regions and the city of Yakutsk. 74.2% of Central Regional Hospitals of the republic possess Schools of Breastfeeding, but consultant certificates on conducting the schools have been issued to of the Hospitals.

In view of the global significance of breastfeeding issues, the UN General Assembly adopted the Convention “On the Rights of the Child”, and its provision governs the right of an infant for breastfeeding (1989).

Current recommendations on breastfeeding are reflected in the Global Strategy for Infant and Young Child Feeding adopted at the 55th World Health Assembly (2002).

In 1991, WHO and UNICEF attempted a joint Innitiative "Hospital Friendly to a Child”. The initiative was directed towards support of women in implementation of their breastfeeding rights and interruption of supply of maternity hospitals with infant formula free of charge or at reduced prices. The initiative states that the practice of late placing of newborns on the mother (skin-to-skin contact), separation of mothers and newborns, stimulation of artificial feeding, etc now at place in most of Russian maternity hospitals contributes into refusal from breastfeeding. Being primarily adopted in delivery units as support of breastfeeding, the initiative encompasses today other institutions providing medical services.

In the joint Declaration of WHO and UNICEF “Protection, Support and Promotion of Breastfeeding; Special Role of Obstetrical Services” (1989) are given “Ten Steps of Successful Breastfeeding” to be implemented into practice in medical services to obtain the status "Hospital Friendly to a Child” [2].

Since 2005, within the framework of the international program “Mother and Child” to be implemented in the Sakha Republic, work on promotion, support, and stimulation of breastfeeding has begun. WHO experts prepared 40 feeding consultants. Systematic work on promotion, support, and stimulation of breastfeeding is underway in the republic. The Scientific Practical Center on Breastfeeding Protection, Health Ministry, Sakha Republic (Yakutia), founded in 2012, and the Coordination Council on Breastfeeding Protection headed by Deputy Health Minister L.I. Verbitskaya achieved 97,7% of breastfeeding in pilot sites of the maternity obstetric services of the Yakut Municipal Clinical Hospital (Head Doctor- N.N. Vasiliyev) in 2014 (Table3).

Table 3

Rates	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Birth giving	3839	3786	3686	4059	4160	4744	4709	5159	5398	5872	6280
Primipara inclusive, in % of the total number	37.2	48.8	45.8	49.4	51.8	48.0	49.0	44.7	44.3	38.0	40.0
Rooming-in, in % of the total number of the admitted	75.2	75.3	86.0	88.0	91.9	92.0	92.3	93.4	93.6	93.8	94.1
Newborns on breastfeeding at admittance to postnatal units, in % of the total number of the admitted	75.0	68.0	69.0	72.0	74.0	70.6	82.0	90.0	93.0	94.0	96.0
Newborns on breastfeeding on discharge, in % of the total number of the admitted	84.0	85.0	78.0	88.0	90.0	92.9	94.2	95.3	97.3	97.4	97.7

The pilot site is awarded the title “Hospital Friendly to a Child” by the UNICEF and WHO and is nominated Coordinator of Breastfeeding Movement in Sakha by the Health Ministry. All work is conducted according to the program “National Program of Breastfeeding of 12 Months”, adopted at the XII Congress of Russian Pediatricians in February, 2009. The popular science edition “My Miracle- My Child, Breast Milk as Basis of Child Health” published by the Nutrition Center of the Research Institute of Health, North-Eastern Federal University, was awarded the title of the best edition of 2014 and was included into “Golden Pool of Russian Science”, it was also awarded the special diploma “For Popularization of Ideas of Child Healthy Feeding from birth and to 3 years”.

The annual event of the International Week of Breastfeeding is held in August. In 2014, the Festival of Breastfeeding in the Sakha Republic (Yakutia) was conducted for parents within the framework of the International Week of Breastfeeding in Sakha on 7 August, 2014 in the Trade and Exhibition Centre “Kruzhalo”. In April, 2014, WHO and UNICEF experts organized the training seminar “Advice on Breastfeeding”, prepared by 20 breastfeeding consultants with issue of international certificates. Specialists of Health Ministry of the Sakha Republic with

scientific support of the Nutrition Center, of the Research Institute of Health, North-Eastern Federal University, conduct work on breastfeeding promotion on the systematic basis in connection with international, national, and regional Mother's Days in October, November and May, 2014, the International Day of Girls in October, 2014, the International Day of Prematurely Borns in November, 2014.

Thus, activities held by the Health Ministry on protection of breastfeeding are aimed at increase of levels and quality of exclusive breastfeeding of 6 months and continued partial breastfeeding for extended periods. Currently, the priority objective of education of breastfeeding consultants to conduct awareness proliferation and educational programs for individuals and groups is a systematized approach. Informative work to form the culture and skills of breastfeeding among wider population will increase a portion of breastfed infants.

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Estimation of Nutritional Status of Children, Adolescents and Students of the Sakha Republic (Yakutia) According to a Single-Moment Questionnaire

ABSTRACT

We estimated nutrition of younger generation of the Republic Sakha (Yakutia). With the help of the questionnaire we found out that the level of breastfeeding up to 4 months was high and made 92% in urban children and 70% of rural ones. In preschool institutions nutrition is unbalanced, with a predominance of carbohydrates. In the adolescents of school age nutrition is deficient on the main components of food, unbalanced on nutrient composition and is characterized by a reduced energy value of the daily diet. The majority of the students have disordered regime and nutrition due to the limited budget in the selection of natural products. This study has shown that in all age groups nutrition must be corrected with a possible use of multivitamin-mineral complexes.

Keywords: breastfeeding, nutrition assessment, preschool children nutrition, school meals, students' nutrition, the micro -, macronutrients.

The balanced diet of children and teenagers plays a significant role in the system of the actions preserving and promoting the health of younger generation [6, 7]. In recent reform years the health of children in the Republic of Sakha (Yakutia) has considerably worsened. The level of physical development has changed and also the nature of nutrition caused as insufficient consumption of nutrient materials, first of all vitamins, macro - and microelements, proteins, as their irrational ratio (Khandy M.V., Prokopyeva S.I., 2005, Stepanova L.A. 2006, Markova S.V., 2000).

The most balanced product for children of early age is women's milk which is considered as "the gold standard" of optimum nutrition promoting biological adaptation in the neonatal period, in correct development of organs and systems of the baby next years, to the prevention of diseases, increase of resistance to harmful factors of environment [1, 2, 3]. However in Russia the prevalence of breastfeeding, despite a number of actions which are actively carried out in recent years, there are only about 40% of children of 3-months age [3]. For harmonious development of the child at the early age the nutrition has to be balanced not only in proteins, fats, carbohydrates, but also to include vitamins, minerals which requirement is significantly increased during active growth.

The rates of physical development of children, since their second year of life, are a little slowed down, but nevertheless remain quite high. Active physical growth is interfaced to intensive formation of bone and muscular systems. Effective accumulation of bone weight at this age influences on the risk of development of osteopenia and osteoporosis next years. The central nervous and endocrine systems continue to develop actively along with the bone and muscular system. The increase in number of contacts of the child with anti-genes of environment demands hard work of immune system. The balanced nutrition in the main nutrients provides normal growth rates and development of the child, and also helps to prevent developing of such alimentary and dependent diseases as anemia, rickets, food insufficiency, obesity and others [8]. It has been proved that the healthy nutrition of children at

early age is able to reduce risk of development of such diseases as diabetes, obesity, cardiovascular pathology and some types of cancer [4]. The correct nutrition organization in preschool institutions plays an important role, there more than a half of children of preschool age is raised up and practically all children are older 1,5 - 2 years old in many large cities and industrial centers. Most of them are there for 9 - 12 hours and their nutrition, except weekends and holidays, is almost completely provided with preschool institution where children are raised up within several years.

The school age is that key period of human body development, final formation of the skeleton and skeletal muscles, a sharp disharmonic reorganization, puberty, changes in the psychological sphere connected with educational process. High growth rate and the anabolic processes demand food sufficient with protein and mineral salts and also exogenous regulators of metabolic processes – vitamins and microelements. The deep neuroendocrine reorganization happening at teenage age creates certain prerequisites for emergence of endocrinopatia and metabolic disorder. In particular, at this age school children begin to have overweight (in some cases obesity), development of diabetes, cushingoid syndrome, skin problems (acne, etc.) and other diseases, the important role in genesis belongs to the alimentary factor [9]. The peculiarity of nutrition of schoolchildren is division of daily diet into two parts. One part is – home nutrition before study, another – the school food including, as a rule, two meals – breakfast and lunch. We should provide the growing organism with enough calories and necessary substances, a balance of all parts of a day diet of the school children by chemical composition, food processing and correct nutrition [5].

Lack of time, food incompetence, modern way of life – has resulted in incorrect food choice. The growth of popular fast food containing various fragrances, dyes, modified components among young generation disturbs us. Therefore bad food habits become serious risk factor of the development of many diseases. Some physiological systems development, first of all neurohumoral continues in the organism of young people, therefore they are very sensitive to diet balance disorder. Unfortunately, last years statistics has shown sharp increase of young people having obesity, diseases of cardiovascular system, diabetes, etc. It is possible to prevent such diseases with the help of healthy lifestyle and, first of all, healthy food habits.

Thus, the purpose of our work was food assessment of children, teenagers and students living in city and rural conditions of the Republic of Sakha (Yakutia).

MATERIALS AND METHODS

Nutrition problems have been studied by questionnaire of 606 people. The 1-st group included 172 children aged till 1 year, in the II-nd - 300 preschool children from 3rd to 7 years, in the III-rd group - 48 school students of 13-14 years, in the IV-th - 86 students of medical institute aged from 18 till 22 years.

The standard questionnaires were used in our research. The data obtained by calculation method were compared to the recommended physiological norms of nutrition for children and approved average daily set of products for preschool institutions and also according to the requirements regulated by MR 2.3.1.2432-08 "Norms of physiological requirements of nutrient materials and energy for various groups of the population of the Russian Federation" (2008) [6].

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0,9% of children of rural areas and 4,9% - city had only breastfeeding at the age of 4 months by S. I. Prokopyeva's data, 2005. According to our questionnaire, the children who were mainly on breastfeeding about 4 months among the rural – 70%, city - 91,8%. The reasons of the breastfeeding stop among rural children more than in a half (54,7%) of cases had a hypogalactia, 13,2% - diseases of mother and breast refusal of the child, 9,4% - illness of the child and 15% - other reasons (mother's study, business trips, dairy mixes, bad regime feeding). When studying the anamnesis of women with hypogalactia: 40% of pregnant women had anemia and pyelonephritis, 29% of women - toxicosis of 1-2 half of pregnancy, three women were operated because of the heart diseases.

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Breakfasts consisted of hot meals (milk porridges, mashed potatoes with sausages, rice pilaf with fruit), cheese sandwiches, 1-2 times a week cottage cheese casseroles, flat cakes with jam. Drinks for breakfast - sweet tea, coffee and cocoa. For lunch children ate the vegetable salads (fresh cabbage, carrots, beet, cucumbers, tomatoes) filled with vegetable oil; first, second and third dishes. First course soups – meat soup and 1-2 times a week fish soup; on the second – meat or fish in the form of cutlets, meatballs, baked puddings, roll, goulash, 1 time in 10 days liver fritters with grain and pasta, 1-2 times a week – stewed vegetables. For improvement of tastes of food seasonings (parsley, fennel, onions, garlic) were used. As the third dish for lunch was compote from dried fruits, the cowberry drink, washbrew, compote allsorts or juice packaged was served. For a snack children received generally flour products: rolls, cheese cakes with jam or cottage cheese, sausage rolls; 1-2 times a week: cookies, wafers, gingerbreads and candies. Children received milk every day, fermented milk products - bifasil or kefir, every other day. Fruit - apples, bananas, pears and tangerines was only once a week. Two times a week children received fruit drink from the fresh frozen fruits and berries, and in other days for a snack sweet tea was offered. The dinner

consisted generally of porridges: oat, millet, cottage cheese casseroles, cheesecakes, an omelet, meatballs semolina, the pies baked fish cutlets with mashed potatoes sometimes once a week; for dinner children had tea with honey.

The meals distribution by calories was the following - considerable percentage of calories of separate meals to the general caloric content of a day diet was during the lunchtime - 47% (in comparison with normal- 35%), and decrease in percentage of caloric content was during a snack - 17% (in comparison with normal - 20%) and for dinner - 14% (normal - 15%). Studying of a diet according to the content of proteins, fats and carbohydrates showed that children received 62 g. of proteins, 61 g. of fats, 320 g. of carbohydrates a day in average, i.e. normal food diet of children were overestimated in carbohydrates. The ratio of proteins, fats and carbohydrates corresponded to the recommended - 1:1:4 only in half of menu. Such products as bread, grain, milk, meat, creamy and vegetable oil, sugar, potatoes were included in the menu daily, fresh vegetables – every other day, fermented milk products (kefir, bifasil, cottage cheese) 2-3 times a week, and fresh fruit, cheese, fish – once a week. No eggs. By the set of products children received less fresh vegetables (actually 100 g. a day - norm 200 g.), fermented milk products (actually 30 ml a day - norm 150 ml) and the salt iodated (actually 2 g. a day - norm 5 g). Children didn't eat eggs but grain products were almost twice more than norm (actually 80 g a day - norm 45 g).

Thus, nutrition of children of preschool age has been characterized by the high content of carbohydrates, 320 g. when the norm was 240 g, overestimate of caloric content of lunches (47% when norm was 35%) and decrease in caloric content of snacks and dinners (respectively 17% and 14% when norm was 20% and 15%). The snack and dinner weren't balanced on carbohydrate structure: large number of pastries and grain products.

In the third group there were 48 school students aged from 13-14 years, pupils of school № 38 of Yakutsk, boys - 15, girls - 33. Studying at school is provided in two changes. Teenagers from the 7th and 8th classes studied at the second change. Lessons began at 14 p.m and to 19.10 p.m. Research was conducted on the basis of questionnaire with the use of a 24-hour method (daily) reproduction of food.

The questionnaire has revealed that most of children ate as usual. One child kept a diet according to the recommendation of the doctor. The questionnaires have revealed that the most part (73%) of teenagers ate 3-4 times a day. Six people ate that day 2 times. Most (94%) of school children had breakfast in the morning. A half of the children had breakfast from 7.30 till 10 a.m. Children preferred sandwich, fried eggs, flakes, yogurt for breakfast, porridges, macaroni. Five teenagers for breakfast ate a chocolate. About a third of children had the second breakfast. Generally it was cookies, pies, more rare - porridges and meat dishes. Most (83,7%) of teenagers had dinner in school canteen. The menu consisted of pastries (sausage roll, pizza), bakery products, yogurt, juice, chocolate. The mid-morning snack was also at school. All children had supper at home. Often teenagers received macaroni or grain with meat, vegetables with meat for dinner.

Studying of frequency of the use of necessary food products revealed that 36% of school children didn't eat fermented milk products in a regular diet: milk, cottage cheese, kefir, yogurt, suorat. Bakery products as daily products didn't specify 19% of children. A half (54%) of school students didn't eat porridge. Only 79% of children ate meat products daily. In a diet beef meat and meat semi-finished products were prevailed (sausages, sausages, cutlets). Fish and seafood only 7% of teenagers, egg - 40%. 42% of school students didn't note Soup in the questionnaire. Almost 40% of children had no fruits and vegetables. No bean in a diet - 41%, grain – 30%. Pasta was used most of children, tinned products - a half. 78% of teenagers used the increased consumption of digestible carbohydrate products: French fries, chips, Coca Cola, chocolate, hamburgers, bakery and confectionery, etc. Especially it should be noted the prevalence of bakery and confectionery in the school menu.

The assessment of food diet of school children has established their discrepancy to the principle of quantitative full value of food. The power value of food diet of teenagers was below the recommended. The boys and girls of the 7th class were provided with energy for 68-65% and corresponded 1644,1±1202,5 kcal/days and 1564,5±867,1, respectively; among school children of the 8th class – for 59-55% also corresponded 1731,4±1050,6 and 1394,6±325,6, respectively. It has been revealed that also the principle of qualitative full value of a food diet wasn't observed. The content of proteins in food diet was lower norms and cover age requirement for 66-75%, thus the most expressed deficiency was revealed among girls of the 8th class. The content of fats in a food diet of teenagers fluctuated from 50,4% of age norm among girls and to 77% of norm among young men. The content of carbohydrates was 43-45% lower than daily requirement. Food diet of school children was also scarce according to the content of iron. Deficiency of iron was reduced both in girls and young men by 66 and 55%, respectively. According to the content of vitamin C in a daily food diet all teenagers had a deficiency, but the deficiency among girls of the 8th class - for 89% was more expressed.

Thus, the food assessment of school children have shown deficiency of the main components of food, imbalance on nutrient structure and also decrease in energy value of a daily diet. Energy of organism and nutrients in boys were 75%, girls - 64% of daily requirement.

In the fourth group there were 86 medical students of the North-eastern federal university named after M. K. Ammosov living in the hostel № 20. Students of the 1 - 3 courses aged from 18 till 22 years from different departments of medical institute, young men - 30, girls - 56 were analysed.

The questionnaire has revealed that 53% of students hadn't any breakfast. 50% of males and 55% of females didn't eat in the morning. Meal frequency among students from 1 to 4 times a day: 2,3% eat food 1 time a day, 34,9% - 2 times, 18,6% - 2-3 times, 20,9% - 3 times, 23,3% - 4 times a day.

Most (88,4%) of students 93% of men and 85,7% of women ate in the canteen of medical institute and "Sergeleekh". During the day 94% of respondents had a snack in dining rooms and buffets of university. For breakfast there was food quick-cooking cereals (15%) of great popularity, then yogurt (8%), 13% of students had coffee. For lunch 38% of students preferred second courses, 28% - first courses and 12% - bakery. For dinner 30% of respondents preferred meat dishes. 28% of students preferred pilaf , bakery and roast (meat with potato) - 23%. 9% of students ate "Doshirak", potato Rolton and Coca - 8%. It should be noted that students didn't eat eggs, fish and milk products.

CONCLUSIONS

1. A significant frequency increase of breastfeeding of children till 4 months has been noted: to 91,8% - in Yakutsk, to 70% - in rural areas (2005 inYakutsk - 4,9%, in the villages - 0,9%). Rural mothers have shown high percent of hypolactia.
2. Nutrition of preschool children is characterized by the high content of carbohydrates, due to the prevalence of bakery and dishes with grain.
3. Nutrition of teenagers is characterized by deficiency of main nutrient components, unbalanced nutrient content and low energy value.
4. Significant disorders of food diet and regime among students have been revealed.

RECOMENDATIONS:

1. Prophylaxis of family planning, maternity leave (for students – academic leave) for young families should be organized. All women with pathology anamnesis, anemia should be made early prophylaxis to reduce risk of hypolactia. All women planning babies shouldn't smoke.
2. All children preschool establishments should systematically correct menu by the main nutrient components and content.
3. School canteens should eliminate fast food, supplying with healthy hot meals. Multivitamins complexes supply.
4. Students should follow healthy lifestyle, have breakfast, lunch, snack, dinner. No fast food. For the purpose of providing diets with enough biologically valuable proteins it is necessary to use their cheap sources (byproducts, skim milk, low-fat kefir, etc.). For fats need it is necessary to use vegetable oil and butter (20 - 25 g). It is necessary to avoid sweets, to include vegetable products.

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Estimation of Nutritional Status of Children, Adolescents and Students of the Sakha Republic (Yakutia) According to a Single-Moment Questionnaire

ABSTRACT

We estimated nutrition of younger generation of the Republic Sakha (Yakutia). With the help of the questionnaire we found out that the level of breastfeeding up to 4 months was high and made 92% in urban children and 70% of rural ones. In preschool institutions nutrition is unbalanced, with a predominance of carbohydrates. In the adolescents of school age nutrition is deficient on the main components of food, unbalanced on nutrient composition and is characterized by a reduced energy value of the daily diet. The majority of the students have disordered regime and nutrition due to the limited budget in the selection of natural products. This study has shown that in all age groups nutrition must be corrected with a possible use of multivitamin-mineral complexes.

Keywords: breastfeeding, nutrition assessment, preschool children nutrition, school meals, students' nutrition, the micro -, macronutrients.

The balanced diet of children and teenagers plays a significant role in the system of the actions preserving and promoting the health of younger generation [6, 7]. In recent reform years the health of children in the Republic of Sakha (Yakutia) has considerably worsened. The level of physical development has changed and also the nature of nutrition caused as insufficient consumption of nutrient materials, first of all vitamins, macro - and microelements, proteins, as their irrational ratio (Khandy M.V., Prokopyeva S.I., 2005, Stepanova L.A. 2006, Markova S.V., 2000).

The most balanced product for children of early age is women's milk which is considered as "the gold standard" of optimum nutrition promoting biological adaptation in the neonatal period, in correct development of organs and systems of the baby next years, to the prevention of diseases, increase of resistance to harmful factors of environment [1, 2, 3]. However in Russia the prevalence of breastfeeding, despite a number of actions which are actively carried out in recent years, there are only about 40% of children of 3-months age [3]. For harmonious development of the child at the early age the nutrition has to be balanced not only in proteins, fats, carbohydrates, but also to include vitamins, minerals which requirement is significantly increased during active growth.

The rates of physical development of children, since their second year of life, are a little slowed down, but nevertheless remain quite high. Active physical growth is interfaced to intensive formation of bone and muscular systems. Effective accumulation of bone weight at this age influences on the risk of development of osteopenia and osteoporosis next years. The central nervous and endocrine systems continue to develop actively along with the bone and muscular system. The increase in number of contacts of the child with anti-genes of environment demands hard work of immune system. The balanced nutrition in the main nutrients provides normal growth rates and development of the child, and also helps to prevent developing of such alimentary and dependent diseases as anemia, rickets, food insufficiency, obesity and others [8]. It has been proved that the healthy nutrition of children at

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Thus, nutrition of children of preschool age has been characterized by the high content of carbohydrates, 320 g. when the norm was 240 g, overestimate of caloric content of lunches (47% when norm was 35%) and decrease in caloric content of snacks and dinners (respectively 17% and 14% when norm was 20% and 15%). The snack and dinner weren't balanced on carbohydrate structure: large number of pastries and grain products.

In the third group there were 48 school students aged from 13-14 years, pupils of school № 38 of Yakutsk, boys - 15, girls - 33. Studying at school is provided in two changes. Teenagers from the 7th and 8th classes studied at the second change. Lessons began at 14 p.m and to 19.10 p.m. Research was conducted on the basis of questionnaire with the use of a 24-hour method (daily) reproduction of food.

The questionnaire has revealed that most of children ate as usual. One child kept a diet according to the recommendation of the doctor. The questionnaires have revealed that the most part (73%) of teenagers ate 3-4 times a day. Six people ate that day 2 times. Most (94%) of school children had breakfast in the morning. A half of the children had breakfast from 7.30 till 10 a.m. Children preferred sandwich, fried eggs, flakes, yogurt for breakfast, porridges, macaroni. Five teenagers for breakfast ate a chocolate. About a third of children had the second breakfast. Generally it was cookies, pies, more rare - porridges and meat dishes. Most (83,7%) of teenagers had dinner in school canteen. The menu consisted of pastries (sausage roll, pizza), bakery products, yogurt, juice, chocolate. The mid-morning snack was also at school. All children had supper at home. Often teenagers received macaroni or grain with meat, vegetables with meat for dinner.

Studying of frequency of the use of necessary food products revealed that 36% of school children didn't eat fermented milk products in a regular diet: milk, cottage cheese, kefir, yogurt, suorat. Bakery products as daily products didn't specify 19% of children. A half (54%) of school students didn't eat porridge. Only 79% of children ate meat products daily. In a diet beef meat and meat semi-finished products were prevailed (sausages, sausages, cutlets). Fish and seafood only 7% of teenagers, egg - 40%. 42% of school students didn't note Soup in the questionnaire. Almost 40% of children had no fruits and vegetables. No bean in a diet - 41%, grain – 30%. Pasta was used most of children, tinned products - a half. 78% of teenagers used the increased consumption of digestible carbohydrate products: French fries, chips, Coca Cola, chocolate, hamburgers, bakery and confectionery, etc. Especially it should be noted the prevalence of bakery and confectionery in the school menu.

The assessment of food diet of school children has established their discrepancy to the principle of quantitative full value of food. The power value of food diet of teenagers was below the recommended. The boys and girls of the 7th class were provided with energy for 68-65% and corresponded 1644,1±1202,5 kcal/days and 1564,5±867,1, respectively; among school children of the 8th class – for 59-55% also corresponded 1731,4±1050,6 and 1394,6±325,6, respectively. It has been revealed that also the principle of qualitative full value of a food diet wasn't observed. The content of proteins in food diet was lower norms and cover age requirement for 66-75%, thus the most expressed deficiency was revealed among girls of the 8th class. The content of fats in a food diet of teenagers fluctuated from 50,4% of age norm among girls and to 77% of norm among young men. The content of carbohydrates was 43-45% lower than daily requirement. Food diet of school children was also scarce according to the content of iron. Deficiency of iron was reduced both in girls and young men by 66 and 55%, respectively. According to the content of vitamin C in a daily food diet all teenagers had a deficiency, but the deficiency among girls of the 8th class - for 89% was more expressed.

Thus, the food assessment of school children have shown deficiency of the main components of food, imbalance on nutrient structure and also decrease in energy value of a daily diet. Energy of organism and nutrients in boys were 75%, girls - 64% of daily requirement.

In the fourth group there were 86 medical students of the North-eastern federal university named after M. K. Ammosov living in the hostel № 20. Students of the 1 - 3 courses aged from 18 till 22 years from different departments of medical institute, young men - 30, girls - 56 were analysed.

The questionnaire has revealed that 53% of students hadn't any breakfast. 50% of males and 55% of females didn't eat in the morning. Meal frequency among students from 1 to 4 times a day: 2,3% eat food 1 time a day, 34,9% - 2 times, 18,6% - 2-3 times, 20,9% - 3 times, 23,3% - 4 times a day.

Most (88,4%) of students 93% of men and 85,7% of women ate in the canteen of medical institute and "Sergeleekh". During the day 94% of respondents had a snack in dining rooms and buffets of university. For breakfast there was food quick-cooking cereals (15%) of great popularity, then yogurt (8%), 13% of students had coffee. For lunch 38% of students preferred second courses, 28% - first courses and 12% - bakery. For dinner 30% of respondents preferred meat dishes. 28% of students preferred pilaf , bakery and roast (meat with potato) - 23%. 9% of students ate "Doshirak", potato Rolton and Coca - 8%. It should be noted that students didn't eat eggs, fish and milk products.

CONCLUSIONS

1. A significant frequency increase of breastfeeding of children till 4 months has been noted: to 91,8% - in Yakutsk, to 70% - in rural areas (2005 inYakutsk - 4,9%, in the villages - 0,9%). Rural mothers have shown high percent of hypolactia.
2. Nutrition of preschool children is characterized by the high content of carbohydrates, due to the prevalence of bakery and dishes with grain.
3. Nutrition of teenagers is characterized by deficiency of main nutrient components, unbalanced nutrient content and low energy value.
4. Significant disorders of food diet and regime among students have been revealed.

RECOMENDATIONS:

5. Prophylaxis of family planning, maternity leave (for students – academic leave) for young families should be organized. All women with pathology anamnesis, anemia should be made early prophylaxis to reduce risk of hypolactia. All women planning babies shouldn't smoke.
6. All children preschool establishments should systematically correct menu by the main nutrient components and content.
7. School canteens should eliminate fast food, supplying with healthy hot meals. Multivitamins complexes supply.
8. Students should follow healthy lifestyle, have breakfast, lunch, snack, dinner. No fast food. For the purpose of providing diets with enough biologically valuable proteins it is necessary to use their cheap sources (byproducts, skim milk, low-fat kefir, etc.). For fats need it is necessary to use vegetable oil and butter (20 - 25 g). It is necessary to avoid sweets, to include vegetable products.

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Health Status of Adolescents in the Republic Sakha (Yakutia)

ABSTRACT

This article analyzes health status indicators of adolescent population of the Republic Sakha (Yakutia), including the dynamics of diseases, socially conditioned diseases, disability and mortality among the teenage population. Negative trends of deceasing of adolescent population, the increase in performance of both primary and general morbidity were established. Analysis of the dynamics of disability among children and adolescents showed a reduction in performance. Among the main causes of deaths in adolescence are external causes, there is no downward trend.

Keywords: adolescents, morbidity, disability, mortality.

The health status of any nation in prospect is determined by health of children as well as adolescents. Adolescence is a period that has high potential for intellectual and physical development, during which forms social skills, including those related to health. For the Republic of Sakha (Yakutia) and Russia as a whole problem the adolescent health status is still actual.

The aim of this research was estimation of adolescent health status and analyzing of trends of their morbidity, disability and mortality in the Republic Sakha (Yakutia).

Analysis of state statistical reports showed that as of 2013 in the Republic Sakha (Yakutia) live 254,298 thousand children under the age of 17 years, inclusive, of which 40,052 15-17 yearsadolescents.

In 2013, in comparison with 2005, the total population increased by 4.9 thousand people (0.5%), and the child population from 0 to 17 years to 25.9 thousand people (8.5%). It should be noted that the number of adolescents in the Republic of Sakha (Yakutia), aged 15-17 years was increased till 2004 (60.8 thousand.), and then began to decrease each year. In 2013 amounting of adolescents became 40.052 thousand, that 20.0 thousand less (33.3%) than in 2005 (table 1).

Analysis of adolescentmorbidity in Republic of Sakha (Yakutia) showed a negative trend of increasing indicators of both the general and primary morbidity.

Compared with 2000, the primary morbidity increased almost 2 time, and the general is 2.7 times (table 2).

In the Republic of Sakha (Yakutia) among primary morbidity in adolescents 15-17 years the 1st place stably occupy respiratory disease with increasing incidence from 2000 in 2 times. At the 2nd place – diseases of the digestive system (159,5 ‰, with an increase in 3.3 times). III place –injury and poisoning and certain other consequences of external causes (115,9 ‰, with an increase in 1.5 times) (table 3).

In dynamics, there is increase of general morbidity in all classes and individual diseases. In structure of morbidity the 1stplace are take respiratory diseases, 2^{d} and 3^{d} place are occupied by diseases of the eye and diseases of the digestive system (table 4).

Against the background of a high level of general morbidity of 15-17 years aged adolescents in the structure of pathology an important role is played by socially significant diseases (HIV, tuberculosis, drug addiction,

sexually transmitted infections by et al.). Causes of social diseases among adolescents believe social maladjustment, low hygiene knowledge, environment condition and early sexual activity. So, abortions among girls aged 15-17 in 2013 amounted to 1.2% of the total number of abortions in all age groups. Of these, 22.3% were spontaneous, 70% health (legal), unspecified 9%, 7% and 1% were produced for medical and social reasons.

Analysis of socially significant diseases indicators of adolescents aged 15-17 years showed a reduction of infections, transmitted mainly through sexual contact. The number of syphilis and gonorrhea cases in 2005 was 36.4 and 97.7 per 100 thousand of teenage population, by 2013 noted the decreasing by 2.5 times (14.6 and 38.9, respectively).

The tuberculosis morbidity in adolescents in 2012 decreased compared to 2005 by 1.7 times (from 51.3 to 30.3 per 100 thousand.), but in 2013 again showed an increase in this indicator till 51.1 per to 100 thousand.

There is still high number of adolescents who are on preventive supervision related with alcohol abuse (257.8 per 100 thousand.), drugs (60.8 per 100 thousand.) and non-narcotic drugs (55.9 per 100 thousand) (table 5).

For better understanding of social determinants of health and well-being of adolescents, we conducted a survey research, considering demographic and social impact on the health of adolescents (11-17 years) in the Republic of Sakha (Yakutia). Our study was conducted in July and November 2011 and May 2012 in Yakutsk city and 7 districts of the Republic Sakha (Yakutia) –Olekminsky, Ust-Maysky, Suntarsky, Aldansky, Tomponsky, Allaykhovsky, Churapchinsky.

We conducted an anonymous opinion poll (dispenser group questioning) of pupils from different educational institutions, using questionnaires the Global epidemic surveillance system health status of schoolchildren with support from WHO / UNAIDS / UNICEF / UNESCO. 748 adolescents aged 10-17 yearswas interviewed. There were 43.9% of boys and 56.2% girls.

According to results of the studies, every third boy and girl answered that never smoked. 35% of boys and 38% girls tried to smoke, 25% of adolescents of both sexesoccasionally smoke. Regularsmokersanounted 7% of boys and girls. Age-related test of first smoking among girls showed the following parameters: 14 years – 23%, 13 years – 12%, 15 years – 15.7%. The boys also start smoking at age 14 years – 26.7%, 13 years – 12% 15 years – 13%. The intensity of smoking was as follows: 1 cigarette per day in 27% of teenage smokers, then 6-10 cigarettes per day in 25%, 3-5 cigarettes per day at 23%.

Children and adolescents had a bad example of smoking due to their immediate environment: friends – 58%, fathers – 33%, mothers – 29%, teachers – 11%. Children of parents who smoke, smoke more frequently than children of non-smokers ($p < 0.04$).

About 30% of teens surveyed intake alcohol. 75% of them prefer beer, 10% wine, 3% vodka. The debut of the first test of alcohol among girls often been in 14-15 years – 42%, in 12-13 years – 32%, in 10-11 years – 11%; in boys the same age trend: 14-15 years – 39%, 12-13 years – 24%, 10-11 years – 16%.

From whole number of interviewed teenagers, 8 persons admitted to the use of narcotic drugs (1.1%), including 6 boys and 2 girls. They rest hashish, cannabis, marijuana and cocaine. The reason for the test, as in the case of smoking and alcohol was curiosity and the desire to feel like an adult.

Another actual medical and social problem of the modern society is children's disability. A level of disability, along with infant mortality, morbidity, physical development and demographic processes is a basic indicator of the health status of the child population. According to WHO experts (Healthforall.DateBase. - Copenhagen: WHO Regional Office Europe Update, 2006), the number of children under the age of 16 years with a limited life and social functions is about 10% of the world population, i.e. more than 120 million.

At the end of 2013 in the Republic Sakha (Yakutia) registered 1091teenager with disability, representing 18.3% of all children with disabilities. Of these, 8.8% – are teenagers with newly installed disabilities.

In recent years, there has been tendency to relative reduction of child, including and adolescent disability. Compared with 2006, the number of young people with disabilities in 2013 decreased by 6.5%. However, it should be noted decrease in the total number of child and adolescent population over the years (table 6).

The structure of the disability causes remains the same: diseases of the nervous system and sense organs 63.9%, congenital malformations 62%, mental illnesses 34.9%.

Another important socio-demographic problem ismortality of adolescents, especially from unnatural and violent deaths. Main place of deaths of teenagers take external causes. Among them, constitute a serious problem suicidal behavior, road traffic injuries, domestic violence, both physical and psychological, the latter is often the cause of suicide in adolescents.

In 2010, we studied202 cases of death among adolescents, which were registered by the Bureau of medical examination during the period 2005-2010. As well, we analyzed data of the Federal State Statistics Service, the territorial authority of the Federal State Statistics Service of the Republic of Sakha (Yakutia), the State report on the health state of the Republic of Sakha (Yakutia) population in 2009.

The following featuresrevealed that the lethality rate among adolescents were related with acts of violence, including suicide and accidents, which is one of the most negative trends in mortality of the child population. There were significant gender differences – deaths from unnatural causes among young men were almost 3 times higher than that of girls. In most cases recorded the death of teenagers from regions of the republic – 109 cases (54%), which may be associated with lower living conditions; in Yakutsk city– 66 cases (33%), the suburbs of Yakutsk – 27 cases (13%). In the structure of mortality from external factors in almost half of all cases are the cause of suicides – 48.5% (28.2% - mechanical asphyxia by airway compression, 9.4% - acute poisoning). The most of accidents are traffic accidents – 16.3%, drowning – 6.4%, a drop of 3.9%, the impact of natural low temperatures – 4.4%.

These results are consistent with the literature, according to which in the past three decades has been an increase of suicidal behavior among young people, when indicated polyvalence risk factors: the relationship between suicide and such factors as unfavorable climate in the family, school problems.

Thus, the analysis of the health status of the adolescent population in the Republic of Sakha (Yakutia) indicates the need for further implementation of therapeutic and preventive measures to reduce the incidence of teenagers. Needs to further improve the system of social assistance to families to ensure the availability and quality of psychological assistance to children and adolescents.

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Table 1.

Indicators of child population of the Republic of Sakha (Yakutia)

for the 1990-2013 years

	1990		1995		2000		2005		2010		2013	
	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%
Total population	1121,3	100	1035,5	100	986,0	100	950,7	100	949,4	100	955,6	100
Children 0-17 year	394,1	35,1	345,8	33,4	301,8	30,6	277,1	29,1	250,7	26,4	303,0	31,7
Adolescents 15-17 year	52,5	4,7	54,0	5,2	59,8	6,1	60,0	6,3	44,5	4,7	40,0	4,2

* The data, is based on the results of the National Population Census 2002

Table 2.

15-17 years adolescents morbidity (by 1000 the teenage population)

	2000	2006	2007	2008	2009	2010	2012	2013
Primary morbidity	763,3	1055,4	1027,0	1111,0	1244,5	1339,9	1457,4	1476,6
General morbidity	784,5	1772,0	1668,3	1740,9	1915,6	2001,6	2182,1	2136,0

Table 3.

Primary morbidity of adolescents aged 15-17 per 1,000 teenage population (according to the YRMIACdata)

Name of classes and certain diseases	by 1000 adolescents					
	2000	2006	2009	2010	2012	2013
Infectious and parasitic diseases	34,5	29,9	23,9	25,8	26,7	31,1
Neoplasms	1,9	5,2	3,7	3,6	5,7	6,8
Diseases of the blood-forming organs	8,3	11,1	16,4	12,4	15,8	14,5
Endocrine diseases, nutritional disorders	31,9	26,5	21,6	21,9	32,3	37,4
Mental and behavioral disorders	19,7	11,3	10,7	10,5	5,5	6,9
Diseases of the nervous system	24,7	41,5	44,8	57,7	59,0	72,3
Diseases of the eye	48,2	61,3	71,2	78,9	77,5	79,2
Diseases of the ear and mastoid process	14,7	20,0	21,8	22,8	24,6	24,6
Diseases of the cardiocirculatory system	7,5	12,3	14,7	13,8	16,7	20,7
Respiratory system diseases	**334,5**	**444,3**	**594,2**	**622,3**	**705,2**	**687,2**
Diseases of the digestive system	48,0	**117,4**	**119,4**	**126,9**	**149,4**	**159,5**
Diseases of the skin	**52,1**	68,2	67,6	76,5	88,1	92,5
Diseases of bones and muscle	16,4	35,7	49,2	54,7	59,5	54,2
Diseases of the genitourinary system	29,9	39,6	40,8	45,3	49,0	56,5
Pregnancy, childbirth and the postpartum period *	13,1	12,2	14,1	19,4	14,9	16,9
Congenital anomalies	2,7	2,7	3,9	3,3	3,4	3,7
Symptoms, signs and abnormal findings on clinical. and of lab. studies, not elsewhere classified, etc.	5,0	8,5	3,1	1,6	4,8	5,3
Injury, poisoning and certain other consequences of external causes	**76,6**	**113,9**	**130,6**	**152,5**	**127,0**	**115,9**

* Index, is calculated on the female population aged 15-17

Table 4.

The general morbidity of adolescents aged 15-17 years (according to the YRMIACdata)

Name of classes and certain diseases	by 1000 adolescents					
	2000	2006	2009	2010	2012	2013
Infectious and parasitic diseases	35,4	41,1	30,4	32,6	33,6	36,0
Neoplasms	2,0	8,2	7,2	7,1	4,4	3,9
Diseases of the blood-forming organs	8,6	29,1	29,2	25,4	29,7	28,2
Endocrine diseases, nutritional disorders	32,8	90,8	72,4	83,5	78,1	83,2
Mental and behavioral disorders	20,2	42,0	45,8	38,3	38,1	46,3

Diseases of the nervous system	25,4	151,6	154,4	162,1	203,4	174,8
Diseases of the eye	**49,6**	**163,8**	**193,5**	**215,4**	**236,5**	**254,0**
Diseases of the ear and mastoid process	15,1	31,9	33,4	33,4	35,4	33,3
Diseases of the cardiocirculatory system	7,7	7,9	6,5	5,1	39,7	39,9
Respiratory system diseases	**343,9**	**542,2**	**709,3**	**708,7**	**795,8**	**754,1**
Diseases of the digestive system	49,3	**204,0**	**199,0**	**202,4**	**226,9**	**230,0**
Diseases of the skin	**53,6**	91,5	89,8	102,3	112,7	113,7
Diseases of bones and muscle	16,9	68,3	80,3	89,9	98,8	88,9
Diseases of the genitourinary system	30,7	74,3	71,2	76,9	81,4	89,3
Pregnancy, childbirth and the postpartum period *	13,4	15,9	16,4	22,4	21,7	20,4
Congenital anomalies	2,7	15,0	18,3	18,9	17,2	18,8
Symptoms, signs and abnormal findings on clinical. and of lab. studies, not elsewhere classified, etc.		59,2	5,7	3,5	7,0	6,2
Injury, poisoning and certain other consequences of external causes	78,7	118,8	135,5	158,5	127,0	118,0

* Index, is calculated on the female population aged 15-17

Table 5.

Socially significant diseases in 15-17 years adolescents of Republic Sakha (Yakutia)

(with the first-ever diagnosis of 100 000 adolescents)

	2005	2006	2007	2008	2009	2010	2012	2013	РФ 2012
Addiction	-	-	-	1,9	2,1	4,3	-	2,4	3,3
Substance abuse	24,8	15,3	43,0	28,7	12,3	19,7	9,3	7,3	4,1
Consists on preventive supervision because the abuse:									
drug	24,8	47,7	44,8	13,4	14,4	35,04	2,3	60,8	н/д
non-narcotic agents	102,6	136,2	127,3	51,7	80,2	74,4	53,6	55,9	н/д
alcohol	395,7	570,5	476,9	633,4	646,0	562,9	116,5	257,8	н/д
Syphilis	36,4	15,3	30,5	30,6	37,0	32,9	14,0	14,6	21,2
Gonorrhea	97,7	93,7	71,7	95,7	86,4	81,0	53,6	38,9	28,6
Tuberculosis	51,3	49,2	30,5	38,3	39,1	32,8	30,3	51,1	32,1
HIV infection:									
Abs. number	1	-	-	-	-				н/д
On 100 000 children	1,6					4,4	-	-	

Table 6.

Dynamics of the number of teenagers who are on disability

In the Republic Sakha (Yakutia), in%

	2006		2010		2012		2013	
	abs	%	abs	%	abs	%	abs	%
Total child population	268,9	100	250,7	100	253,7	100	254,3	100
Total children with disabilities	7,172	2,7	6,166	2,5	6,045	2,4	5,952	2,3
Total teenage population	57,4	100	44,5	100	41,1	100	40,0	100
Adolescents with disabilities	1,750	3,0	1,294	2,9	1,139	2,7	1,091	2,7

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Congenital anomalies of urogenital system at children

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The analysis of 588 clinical reports of children with urogenital system pathology treated in Nephrological and Urological units of the Pediatric Centre SBI RS(Y) RH №1 – NCM for 2012-2014 was carried out in this research. The structure of congenital anomalies of urinary system in children is established for the first time.

Keywords: congenital anomalies, urogenital organs, children.

Introduction. Congenital anomalies (CA) of urogenital system (UGS) appear to be serious a medical-social problem as they cause the development of urinary tract infection (40-80%) [5, 7], up to the development of chronic renal failure (65%) [1, 4, 6]. CA of UGS refer to a list of the most frequent congenital anomalies which are included in the International defects register which are subject to genetic monitoring (International Birth Defects Monitoring System, Eurocat). According to the incorporated register EUROCAT and the register of the Russian Federation for 2000-2010 UGS defects occupy 3rd place (15,17 and 17,18% accordingly) in the structure of the leading congenital anomalies [2].

In the structure of UGS various cases of obstructive pathology (hydronephosis, ureterhydronephosis, gidrokalikoz) rating 12-17% of all CA UGS [5] are considered the most prevalent. In pediatrics vesicoureteral reflux (VUR) is noted as one of the most common congenital anomalies as well, its morbidity rating 35-64,5% at children with urinary infection. As a result of this complication reflux nephropathy is observed at 30-60% of children with VUR [3].

Thus, because of high incidence rate of the urogenital system and its great influence to the structure of infantile death rate, infantile morbidity and physical disability it is necessary to study the given problem firstly from the point of view of prevention, early diagnostics.

The aim of the research: to establish a structure of congenital anomalies of urinary organs at children.

Materials: Clinical records of 588 children from 1 month to 17 years with congenital anomalies of urogenital system for 2012-2014 are studied. Examination of children was conducted in nephrological and urological units of the Pediatric center of the State Budgetary Institution RS (Ya) RB №1 – NCM according to medical-economic standards of the investigation of children with urogenital system pathology.

Results and discussion: 588 children were involved in the survey, including 189 (32,1%) of them from 1 month to 12 months, 98 (16,7%) from 1 to 3 years and 301 (51,2%) of them 3 years old and over. Among them there were 245 (41,7%) girls and 343 (58,3%) boys. Out of all inpatient children 328 (55,7%) children were from Yakutsk and 260 (44,2%) were from rural areas . Among the rural children the greatest number of children were from Hangalassky (12%) and Mirninsky (7,7%) regions. As for ethnicity there were 361 (61,4%) Yakuts, 198 (33,6%) Russians and 29 (5%) of children of other nationalities.

The analysis of the clinical records showed that during the studied period 479 children with isolated and 109 children with combined congenital anomalies of urogenital system were examined. In the structure of the isolated anomalies of UGS vesicoureteral reflux (34,4%) and hydronephrosis (35,7%), and pyelocaliceal system enlargement (a piyeloectasia, calycectasis) were diagnosed at 7,7% of cases (Tab. 1). Thus, VUR in 37%, and hydronephrosis in 4% of cases had bilateral localization. Besides the isolated anomalies of urogenital system at children the combined anomalies (Tab. 2) were revealed. Among them the leading positions are taken by uretrohydronephrosis (39,4%) and VUR in combination with hydronephrosis (6,4%) and more frequently renal hypoplasia (5,5%). Generallly, in dynamics, for 2012-2014 the increase of the total amount of UGS pathology at children by 1,3-1,4 times was noted (29-30% to 41%).

Secondary chronic pyelonephritis is diagnosed at 423 (72%) patients. 24 children (5,6%) had complicated secondary chronic pyelonephritis: wrinkling of kidneys at 6 (25%) patients, chronic renal failure (stages 1 and 3) at 2 (8,3%) children and nephrectomy at 16 (66,7%) patients (concerning hydronephrosis - 12 and PMR - 4).

Conclusion. Thus, on the basis of the obtained data it is possible to make the conclusion that in the structure of anomalies of UGS vesicoureteral reflux (34,4%), hydronephrosis (35,7%), and as well as: uretrohydronephrosis (26,6%), VUR with hydronephrosis (6,4%), VUR with renal hypoplasia (4,6%) appear to be the most frequent cases at children. The urinary infection as a result of urodynamics disorder is registered in 72% of cases of congenital anomalies of UGS. The development of complications (5,6%) which can lead to children's disability is considered to be an important factor as well. Therefore, timely identification and carrying out surgical correction of these uropathy pathologies are needed that will allow to avoid serious consequences at congenital anomalies of urogenital system .

Table 1

The isolated congenital anomalies of urogenital system at children

Type of anomalies	2012 г. n=136		2013 г. n=138		2014 г. n=205		n=479
Vesicoureteral reflux	52	38,2%	40	29%	73	35,6%	165 (34,4%)
Hydronephrosis	52	38,2%	53	38,4%	66	32,2%	171 (35,7%)
Renal agenesis	5	3,7%	2	1,4%	5	2,4%	12 (2,5%)
Renal polycystic	5	8,4%	3	2,2%	5	2,4%	13 (3%)
Renal hypoplasia	6	4,4%	5	3,6%	8	4%	19 (4%)
Renal dystopia	2	1,5%	6	4,3%	4	2%	12 (2,5%)
Horseshoe-shaped kidney	2	1,5%	3	2,2%	3	1,5%	8 (1,7%)

Doubling of kidney	1	0,7%	4	3%	6	3%	11 (2,3%)
Pyelocaliceal system enlargement (piyeloectasia, calycectasis)	6	4,4%	11	8%	20	10%	37 (7,7%)
Ureterocele	2	1,5%	-	-	1	0,5%	3 (0,6%)
Syndrome Frehley	-	-	3	2,2%	-	-	3 (0,6%)
Nephroptosis	-	-	1	0,7%	2	1%	3 (0,6%)
Renal cyst	-	-	1	0,7%	-	-	1 (0,2%)
S-shaped kidney	-	-	1	0,7%	-	-	2 (0,4%)
Renal aplasia	-	-	1	0,7%	2	1%	3 (0,6%)
Vascular anomaly of kidneys	-	-	2	1,4%	3	1,5%	5 (1%)
Urinary fistula	1	0,7%	-	-	-	-	1 (0,2%)
Renal multicyst	2	1,5	-	-	6	4%	8 (1,7%)
Ureter bending	-	-	-	-	1	0,5%	1 (0,2%)
Agenesis of ovary	-	-	1	0,7%	-	-	1 (0,2%)

Table 2

The combined congenital anomalies of urogenital system at children

Types of anomalies	2012 г. n=35		2013 г. n=38		2014 г. n=36		n=109
VUR+doubling of kidney +ureterocele	1	3%	-	-	-	-	1 (1%)
VUR+posterior urethral valve	-	-	-	-	1	3%	1 (1%)
VUR+doubling of kidney	1	3%	1	2,6%	1	3%	3 (3%)
VUR+megaureter	2	6%	1	2,6%	1	3%	4 (3,7%)
VUR+renal hypoplasia	1	3%	3	8%	2	6%	6 (5,5%)
VUR+renal agenesis	-	-	1	2,6%	-	-	1 (1%)
VUR+renal dystopia	-	-	1	2,6%	-	-	1 (1%)
VUR+renal dystopia +renal hypoplasia	-	-	-	-	1	3%	1 (1%)
VUR+doubling of ureter	1	3%	-	-	-	-	1 (1%)
VUR+ Horseshoe-shaped kidney	2	6%	-	-	-	-	2 (2%)
Ureterhydronephrosis +posterior urethral valve	1	3%	-	-	-	-	1 (1%)
Ureterhydronephrosis +posterior urethral valve + VUR	1	3%	-	-	-	-	1 (1%)
Urethrohyrdonephrosis +VUR	1	3%	2	5,3%	-	-	3 (3%)
Ureterhydronephrosis +doubling of kidney	1	3%	-	-	-	-	1 (1%)
Ureterhydronephrosis	10	28,5%	19	50%	14	39%	43 (39,4%)
Ureterhydronephrosis +ureterocele	-	-	1	2,6%	-	-	1 (1%)
Hydronephrosis+ VUR	2	3%	-	-	5	14%	7 (6,4%)
Hydronephrosis +nephroptosis	2	6%	-	-	-	-	2 (2%)
Hydronephrosis+VUR+renal hypoplasia	-	-	-	-	3	8,3%	3 (3%)
Hydronephrosis + piyeloectasia	-	-	-	-	1	3%	1 (1%)
Hydronephrosis+renal dystopia +renal hypoplasia	-	-	-	-	1	3%	1 (1%)
Hydronephrosis + Renal mulicystosis	1	6,7%	1	5,9%	-	-	2 (2%)
Hydronephrosis + Horseshoe-shaped kidney	2	13,3%	-	-	-	-	2 (2%)
Hydronephrosis +удвоение почки	-	-	1	5,9%	-	-	1 (1%)
Renal hypoplasia+nephroptosis	1	3%	-	-	-	-	1 (%)
Renal hypoplasia+ renal dystopia	2	5,7%	-	-	2	5,5%	4 (3,6%)
Renal dystopia +doubling of kidney	-	-	1	2,6%	-	-	1 (1%)
Renal dystopia + renal hypoplasia	-	-	1	2,6%	-	-	1 (1%)
Renal dystopia +syndrome Frehley	1	3%	-	-	-	-	1 (1%)
Renal dystopia +L-shaped kidney	-	-	2	5,3%	-	-	2 (2%)
Renal agenesis + piyeloectasia	1	3%	-	-	-	-	1 (1%)
Renal agenesis +cyst	-	-	1	2,6%	-	-	1 (1%)

Horseshoe-shaped kidney+ piyeloectasia	-	-	1	2,6%	1	3%	2 (2%)
Horseshoe-shaped kidney + doubling of kidney +renal hypoplasia	-	-	-	-	1	3%	1 (1%)
Syndrome Frehley+ piyeloectasia	-	-	1	2,6%	-	-	1 (1%)
Doubling of kidney +renal dystopia	-	-	-	-	1	3%	1 (1%)
Renal mulicystosis+megaureter	-	-	-	-	1	3%	1 (1%)
Renal agenesis +hydronephrosis	1	3%	-	-	-	-	1 (1%)

Note: VUR - vesicoureteral reflux

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Cholecystitis and Cholangitis at Children

ABSTRACT

The purpose of this article was to study the features of course, prevalence, and the cholecystitis formation causes in children of Sakha (Yakutia). The following clinical features of cholangitis and cholecystitis in children: pain in the right hypochondrium, nausea, vomiting, fevers up to 37, 5 degrees C were revealed. Positive symptoms by Ortner, Musset, Murphy and Kera were found in the all examined children. On ultrasound thickening of the walls of the gall bladder, enlargement of the gallbladder, which is an indirect evidence of the inflammatory process, were revealed.

Keywords: dysfunctional disorders, biliary system, gall bladder, biliary path, diseases, pathology.

INTRODUCTION

Cholangitis, cholecystitis, non-specific inflammatory lesion of the bile ducts and gall bladder acute or chronic. Inflammation of the gallbladder, or cholecystitis in children more likely to have bacterial origin, it is sometimes secondary to biliary dyskinesia, the presence of gallstones, when parasitic infestations.

The nature of the pathological process of acute cholecystitis is divided into catarrhal, phlegmonous and gangrenous. These form part of the patients can be considered as the stage of the disease. The leading role in the development of acute cholecystitis infection belongs. The most common pathogen is Escherichia coli; less likely to cause disease staphylococci, streptococci and enterococci. Cholecystitis occurs when autolytic lesions of the mucous membrane of the gall bladder as a result of the cast in the cavity of the pancreatic juice. Inflammation is possible with helminthic infestation (ascariasis). It must be remembered that the infected bile does not cause inflammation of the gallbladder without predisposing factors - stagnation and damage to the walls of the body. Stagnation contribute to organic changes in ways bile outflow (compression or bend the neck of the gallbladder and ducts, obstruction of the duct by a stone, mucus, or worms), and dyskinesia of the gallbladder and biliary tract under the influence of the nutritional (rhythm, quantity, quality of food, overeating, eating fatty foods). The role of emotional stress, stress, physical inactivity, metabolic disorders, leading to changes in the chemical composition of bile. Inflammation of the gall bladder reflex may occur when the disease of the other organs of the gastrointestinal tract as a result of viscero-visceral interactions. Damage to the wall of the gallbladder is possible with the irritation of his mucous membranes by bile with modified physico-chemical properties (lithogenic bile), trauma calculi, worms, pancreatic enzymes flows into the common bile duct (spasm of the sphincter of Oddi).

Aim: to examine the course, prevalence and causes of formation of cholecystitis in children of Sakha(Yakutia)

MATERIALS AND METHODS

We conducted a survey and analysis of patient charts 51 children living in encampments (Zhigansky, Olenek, Abyysk, allaikhovskiy) of the Republic of Sakha (Yakutia) on the basis of the consultative polyclinic of the pediatric center of national center of medicine. All patients were examined by a pediatrician and specialists: gastroenterologist, cardiologist, endocrinologist, otolaryngologist, surgeon, orthopedist, allergist-immunologist. All

patients underwent General clinical research (General analysis of blood and urine, biochemical blood tests (liver function tests, rheumatology test, etc.), functional methods, in the presence of pathology. All children performed an abdominal ultrasound and liver, ultrasonography of the biliary tract, CT.

The obtained radiographs and tomograms well-visualized structure of the biliary tract, which can detect the cause of the obstruction.

Statistical calculations made on the basis of applied programs "SAS" and "SPSS" In the analysis of contingency tables (estimates of the correlation of the characteristic and evaluation of significance of differences between groups) used the criterion of □2 (Pearson and likelihood ratio and Fisher's exact test. Comparison of mean values was performed univariate analysis of variance using T-student criterion for assessing the equality of mean F-Fisher test to assess equality of variance. The relationship between parameters was assessed using coefficients of the linear and rank correlation. To assess the relative risk of each of the indicators of risk factors and their distant shades, as well as to select the most meaningful combinations of risk factors used logistic regression (univariant analysis for each of the characteristics separately and multiple step-by-step method for the totality of symptom).

RESULTS AND DISCUSSION

In 15 (29%) children with chronic cholangitis discovered Giardia, 10 (19%) -ascariasis, 30 (59%) children on the ultrasound detected bend the neck of the gallbladder, in 20 (39%) children the day before was psycho-emotional stress and overload.

Only in 5 children discovered cholecystitis, 2 children cholecystitis was calculous. The clinical course of cholangitis detected with the following features: pain in the right hypochondrium in 51 (100%) of the surveyed children, nausea was observed in 40 (78%) children, vomiting in 30 (59 %) of children 51 children was an increase in temperature to 37.5 degrees. Positive symptoms Ortner, Musset, Murphy and Kera found in all examined children. Symptom of hepatomegaly was detected in 40 (59%) children. Intoxication syndrome (weakness, loss of appetite) were observed in 51 children.

Symptom of jaundice was observed in 36 patients. Thus, Charcot's triad (pain in the right hypochondrium, jaundice and fever) were observed in 36 (60%) patients. 5 patients detected concomitant chronic hepatitis. On ultrasound in all the examined children revealed thickening of the walls of the gallbladder, more than 3 mm, and 50% of patients noted an increase in the gallbladder, which is an indirect evidence of the inflammatory process.

Laboratory studies revealed a different spectrum and intensity changes of liver function and other laboratory tests. In General, the analysis of blood revealed a moderate acceleration of erythrocyte sedimentation rate in 40 (78%) patients, lymphocytosis in 48 (80%) children. In biochemical studies revealed increased ALT activity and/or ACT in 50 children, dysproteinemia due to hypoalbuminemia and increased levels of gamma globulins in 40 children, moderate - total bilirubin due to the associated and to a lesser extent - free fraction, the activity of alkaline phosphatase was observed in 23 children. Serology confirmed the presence of hepatitis in 5 patients.

Immunological studies reveal decrease in the number of T-lymphocytes in 50 (95%) children, T-suppressors in 46 (76%), increasing T-helper cells in 38 (72%), increasing concentrations of immunoglobulins G and M in 51 children.

Thus, thickening of the gallbladder wall on ultrasound is a non-specific symptom, it is possible to establish the diagnosis of cholecystitis only one with this symptom, the Clinician may not, it needs to take into account the clinical picture of the disease and laboratory analysis data.

CONCLUSIONS

1. In biochemical studies of blood in children of patients with cholecystitis and cholangitis noted: hyperbilirubinemia at the expense of both factions, signs of inflammation - increased sialic acid seromucoid. Immunological studies reveal a decrease in the number of T-lymphocytes, T-suppressors, elevated levels of T-helper cells, increased concentrations of immunoglobulins G and M in 51 children in the concentration of immunoglobulins G and M in 51 children.

2. Thickening of gallbladder wall on ultrasound is a non-specific symptom, it is possible to establish the diagnosis of cholecystitis only one with this symptom, the Clinician may not, it needs to take into account the clinical picture of the disease and laboratory analysis data.

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Nutrition of the Sakha (Yakutia) Republic Children: Current State, Issues and Their Solutions

ABSTRACT

The modern characteristic of providing children of early age by specialized products of baby food in the Republic of Sakha (Yakutia) is given. The assessment of the organization of medical foods in the children's medical organizations is carried out. Separate problems at various stages of the organization of free and medical foods are revealed. In the solution of these problems scientifically based recommendations about food improvement are developed, pilot platforms are created, innovative technologies of optimization of structure of food of younger generation take root.

Keywords: optimization of structure of food, food of children and teenagers, specialized products, free and medical foods, innovative technologies.

INTRODUCTION

Health protection of population in the Republic of Sakha (Yakutia) is a priority of the Head and the government of the Republic of Sakha (Yakutia), medical science, practical health care and regional innovative development specialists, with providing safe and quality healthy food, as the major issue of national security and improvement of the life quality, adaptation potential and socialization, education and teaching of the rising generation.

Meanwhile, inadequate development of healthy lifestyle and food practices, incorrect eating behaviors and low eating culture, a decrease of food quality and safety facilitating development of many deficient states and alimentary diseases (iron-deficient states and anemia, iodine-deficient states and endocrinopathy, calcium- and phosphorus-deficient states, osteopenia, and osteoporosis), as well as many non-infectious diseases (metabolic imbalance, overweight and obesity, pancreatic diabetes, arterial hypertension and many allergic diseases) which risk factors pose certain goals and objectives before medical science, practical healthcare, and innovative development of the region in solving important nutrition problems.

Material and methods. Analytical databases of standardized questionnaires approved by the Ministry of Healthcare of the Republic of Sakha (Yakutia) (Form 1), questionnaires of healthy eating, and nomenclature indicators of standard diets (Form 2) were used in the work.

Results. In recent years, the Ministry of Healthcare of the Republic of Sakha (Yakutia) carries on work in the area of optimization of population nutrition, organization of activities on promotion of healthy and clinical food according to the Agreement on Cooperation between the government of the Republic of Sakha (Yakutia) (Head G.I. Danchikova) and the Federal State Government-Financed Research Institution, Research Institute of Nutrition (Director, member of the Russian Academy of Sciences V.A. Tutelyan) of June 24, 2010. Arrangement of free food distribution for children under 3 is done according to the Resolution of the government of the Republic of

Sakha (Yakutia) No. 105 of April 16, 2015 "*The Order of Provision of Expectant and Nursing Mothers as well as Children under 3 with Adequate Nutrition in The Republic of Sakha (Yakutia)"* [1]. The adopted Order prescribes indicators for provision of expectant and nursing mothers as well as children under 3 with a diet of high nutritional quality, and secures recording, accounting, and control of nutrition provision. The document confirms the form of requirements of freehealthy nutrition and a range of food for expectant and nursing mothers, as well as children till 3 years. Arrangement of clinical nutrition in children's healthcare institutions is regulated by the recommendations of the Core Commission on Dietetics, the Regional Expert Council of Healthcare, the Ministry of Healthcare of the Russian Federation and is carried out in pursuance of the Order of the Ministry of Healthcare of the Russian Federation "*On Improvement of Arrangement of Clinical Nutrition in Medical Institutions of the Russian Federation",* August 5, 2003 with amendments and additions [2]. The main coordinator of this work is the Center of Clinical and Preventive Nutrition, Research Institute, North-Eastern Federal University named after M.K. Ammosov.

Realization of measures for provision of children under 3 with free food has been conferred on the Ministry of Healthcare of the republic since 2012.

As for 2014, the total number of children from birth to the age of 3 amounted 48.511 in the republic, from them 31.666 children were provided with free food, 65.3 % of the total number of children. The number of consumed adapted milk formulas from 0 to 6 months was 111,087 tins and cartons (Similac Premium, Similac, Selia, NAN, Nutrilon, Nestogen, Agusha Original, Bebi, Hippcombiotic). Among 7 to 12 months, 94.348 tins and cartons were distributed (Selia, Nestogen, NAN, NAN Comfort, Similac premium, Similac, Agusha original, Frisolac, Nutrilon). Among infants from birth to 12 months, 35,764 tins were distributed (Nutrilac immune bifi), NAN, Similacantireflux, Similac premium, MD Mil kozochka). Infants of 1-3 years of age received 151.275 tins and cartons (Similac, Nutrilon, Nestogen, NAN, Frisolac, Hipp). Also, food with medioprophylactic effects was distributed: hypoallergic, cultured milk, lactose-free, antireflux, for premature, based on hydrolyzate, low lactose in amounts of 58.929 pieces and special-purpose manufactured baby food (baby porridge, purée, juice) in amounts of 8.046 pieces, in general, porridge was purchased by the Tattinskaya Central Hospital, juice by the Churapchinskaya Central Hospital. In some areas (the Chirapchinskiy and Neryungrinskiy regions) liquid milk was purchased in amounts of 50.524 l pieces. Generally, delivery of products in 2014 began mostly from July 2014, in the first half of the year product realization was made based on residues of 2013, including transfer from one district to another. In rural areas, products were generally, in 82.9 % of cases, kept in healthcare organizations, being generally distributed from children polyclinics.

Suntarskiy and Tomponskiy regions still have infant feeding centers and all products are distributed through them. In 42.9 % of medical institutions there are employees responsible for baby free food distribution, including dietary nurses in Eveno-Bytantayskiy, Churapchinskiy, and Tomponskiy regions; nurses of general-duty work in 12 other regions; storekeepers, logistics managers, and technicians are engaged in 17 regions, a hospital attendant is working in Khangalasskiy region. In general, all employees responsible for baby foods have no qualifications. In 28.6 % of central regional hospitals, employees responsible for distribution of free nutrition work for one wage rate, 8 do for 0.5 wage rate, in 17 medical institutions this work is an additional duty.

Issues of arrangement of clinical nutrition in medical-prophylactic institutions are regulated, first of all, by the Order of the Ministry of Healthcare of the Russian Federation of August 5, 2003. According to this order, work of a dietary doctor, a dietary nurse, and the Council of Clinical Nutrition is organized in medical-prophylactic

institutions of the Republic of Sakha (Yakutia). Clinical and enteric nutrition in medical-prophylactic institutions is arranged in accordance with various instructions.

General management of dietary nutrition at the medical-prophylactic institution is carried out by the Head Doctor, in his or her absence- by the Deputy for Medical Work. In 82.9 % of medical-prophylactic institutions, employees responsible for arrangement of clinical nutrition were appointed by orders of Head Doctors which is 20.7 % more than in 2013 (69.2 %). 40 % of medical-prophylactic institutions have Councils for Clinical Nutrition, in comparison with 2013, this indicator increased by 13.1 %. The Council includes members of the crew for nutritive support. In 2013, a team for nutritive support worked only in the Suntarskaya Central Hospital, but in 2014 they were organized in 5 more hospitals (Kobayskiy, Megino-Kangalasskiy, Mirninskiy, Nyurbinskiy and Olenekskiy hospitals). Staffing level increased during the period under consideration: there were 37.2 % of works managers which is 17.9 % higher than in 2013 (19.2); 103 cooks of various qualifications were working in different central district hospitals in 2013, with their number increasing up to 125 in 2014.

In a medical-prophylactic institution, a nutritionist is responsible for organization of clinical nutrition. In cases of absence of a nutritionist, a dietary nurse is responsible for this work. In the Republic of Sakha (Yakutia), 3 nutritionists professionally retrained in dietetics at the Nutrition Department, Russian Medical Academy of Post-Diploma Education (Moscow), were working at various medical-prophylactic institutions in 2014: at the National Medical Center *Republican Hospital No. 1*, the National Center *Phthisiology* and part-time in the state government-financed institution of the Republic of Sakha (Yakutia) the *Yakutsk Municipal Children's Hospital*. Dietary medical nurses are trained at the Head Medical College. At the end of 2014, medical-prophylactic institutions of the Republic of Sakha (Yakutia) were staffed with dietary medical nurses making 52.2 %, which is 13.7 % more than in 2013 (38.5 %). In 2014, eight medical workers studied at advanced courses for organization of clinical nutrition in medical-prophylactic institutions. In 23 medical-prophylactic institutions, consultations for wider population on issues of healthy and clinical nutrition are held.

One of the main steps in realization of prophylactic measures on clinical nutrition is the activity of the *School of Healthy Nutrition* approved by the orders of the Ministry for Healthcare of the Republic of Sakha (Yakutia), 2005 [3]. After 2014, *Schools of Healthy Nutrition* function in 12 medical organizations of the Republic of Sakha (Yakutia) (34.3 %) which is 25.7 % more than in 2013. In 2013, such schools worked only in the Namskaya, Lenskaya, and Olenekskaya central district hospitals.

To optimize clinical nutrition, develop organization and improve management of its quality, a system of standard diets, differing in their contents of main nutrients and caloric value, technology of food preparation and average daily food assortment, is being introduced in medical-prophylactic institutions of the Republic of Sakha (Yakutia). Medical workers in 91.4 % of medical-prophylactic institutions of the Republic of Sakha (Yakutia) use a new diet nomenclature (76.9 % in 2013), no diets have been elaborated in the Abyiskaya, Anabarskaya, and Oymakonskaya central district hospitals. In 62.9 % of medical-prophylactic institutions of the Republic of Sakha (Yakutia), analysis of effectiveness of organization of clinical nutrition is performed by employees responsible for nutrition or a dietary medical nurse (42.3 % in 2013).

Separate nutrition units are in 94.3 % of the medical-prophylactic institutions (88.5 % in 2013), and all of them are under the medical institution itself. 22.9 % of the nutrition units of medical-prophylactic institutions of the Republic of Sakha (Yakutia) have been renovated, 31.4 % have been redecorated, 22.9 % need renovation, and 22.9 % need redecoration. In comparison with 2013, a percentage of nutrition units requiring renovation decreased

in 2014 by 42.3 and 22.9 %, respectively. 37 % of nutrition unit equipment needs replacement, 17.1 % – an overhaul, and 24.6 % – medium repair. In 2013, these indicators were 50. 20.8, and 29.2 %, respectively.

Generally (92.3 %) imported products are used for food preparation, localproducts comprise only 7.7 % of the total volume of the products servedat medical organization. The technological process of clinical nutrition preparation consists of the full (94.3 %) and distributing (5.7 %) cycles. Food quality control at its arrival to a warehouse and a nutrition unit, control of food stock storage, control of food preparation is conducted by an employee responsible for organization of clinical nutrition. 85.7 % of medical-prophylactic institutions of the Republic of Sakha (Yakutia) have a 7-day menu, the Eveno-Bytantayskaya, Tomponskaya, Tattinskaya, Verkhnekolymskaya, Amginskaya central district hospitals lack menus. 60 % of them additionally have a “winter” and a “summer” options. Analysis of major documents (distribution cards, distribution record sheet, etc.) made in 2013revealed that 88.5 % of medical-prophylactic institutions of the Republic of Sakha (Yakutia) did not keep the records, with only the Eveno-Bytantayskaya central district hospital being an exception. The prophylactic medical examination of employees of nutrition units and cafeterias is performed according to the confirmed schedules. In 2014, nutrition unit employees of 71.4 % of medical-prophylactic institutions of the Republic of Sakha (Yakutia) were trained, sanitary-educational work on clinical nutrition was conducted in 68.6 % of medical-prophylactic institutions of the Republic of Sakha (Yakutia). In general, eating patterns involve 4 meals, 20 % of medical-prophylactic institutions prepare 3 meals, 60 % - 4 meals, and 20 % - 5- 6 meals a day.

According to estimations, in all children’s hospitals and departments of the republic there are 2.148 beds, including 24.029 children under treatment, the actual cost of eating for one child was in average 182 Rubles 72 Kopeks (in 2013, it made 150 Rubles 12 Kopeks). Food is unvaried, one product is insufficiently replaced by another one (25.7 %), specially prescribed products of clinical nutrition are insufficiently presented in a dietary intake (34.3 %), 26.9 % of them are produced in Russia, 15.4 % - abroad. In 31.4 % (50% in 2013) of medical-prophylactic institutions of the republic there are nostandards of dietary intakes of clinical nutrition elaborated by experts. The dietary intake includes: up to 100% of white bread, 40% of rye bread, 17.1 % of potato flour, 100% of cereals, beans, and pasta, 100% of potato, 85.7 % of vegetables and greens, 65.7 % of fresh fruits, 100% of dried fruits, 62.8 % of juice, 100% of sugar, 100% of confectionary, 100% of butter, 100% of vegetable oil, 60% of eggs, 9% of curds, 37.1 % of milk and 62.8 % of cultured mils products, 34.3 % of sour cream, 42.8 % of cheese, 100% of meat of the first category, 37.1 % of sausages, 77.1 % of birds of the first category, 22.9 % of sea food, 88.6 % of fish (filet), 14.3 % of herring, 31.4 % of coffee and cocoa of the daily requirement. All medical-prophylactic institutions hold the records of prepared food (Form No. 6-lp).

Nutrition units (83.9 %)are equipped with fully mechanical, heating, and refrigeratingmachines. Heat equipment is available in the Anabarskaya and Zhiganskayacentral hospitals (5.7 %), the Eveno-Bytantayskaya, Ust-Yanskaya, Srednekolymskaya,Abyiskaya central district hospitals (11.4 %) are equipped with refrigerating machines. For primary food processing, the following mechanical equipment is available: machines to process cereals, potato, and vegetables (15.4 % of the total number of medical-prophylactic institutions), machines to process meat and fish (53.8 %), machines to prepare dough (26.9 %), tanks and machines for dish washing (53.8 %), machines to cut bread and eggs (11.5 %), mixing machines for liquid formulas (26.1 %). For hot food processing, the following equipment is available in nutrition units of medical-prophylactic institutions of the Republic of Sakha (Yakutia): cooking (53.8%), frying (76.9%), and non-mechanized (42.3%) machines. From refrigerating equipment there are refrigerating chambers (88.5%) and refrigerating cabinets (57.7%). In 85.7% of medical-prophylactic institutions of the Republic of Sakha (Yakutia) they provide meals for caretakers of sick children. Prophylactic

examinations for employees of the nutrition units are held 1-2 times per year. Vitamin fortification of food is made in 60% of medical-prophylactic institutions, enteral nutrition is arranged and patients' nutrition status is estimated in 54.3% of medical-prophylactic institutions. To provide enteral nutrition, instant special purpose products are used (Nutrison, Neoshur, Alfare, Prenan, broths, 5% porridges), mostly enteral nutrition formulas were injected through a feeding sound in 71.4% of medical-prophylactic institutions, through a tube in 5.7% of medical-prophylactic institutions, and through a stoma in 2.8% medical-prophylactic institutions of the republic.

Thus, arrangement of clinical nutrition in medical institutions is one of the main medical measures for different diseases and pathological states. Clinical nutrition is a component of integrated therapy. One of problems of nutrition and health of infants is an increase of the number of functional health disorders. According to data of clinical-epidemiological examination conducted by the Nutrition Center, Research Institute of Health, North-Eastern Federal University, 2/3 of infants have functional disorders of digestion, iron-deficient states, paratrophic disorders, and others, exposing them to risk of many chronic non-inflectional deceases further in adult life. In this regard, the government of the republic pays a great attention to social aid to population with low income. At present, monitoring is conducted and the draft of the program "*National Program on Optimization of Nutrition of Infants from 1 to 3"* is being developed by Russian specialists.

Issues of prevention and treatment of children with diseases related to nutrition disorders have become a special topic of advanced training courses for medical workers of the republic. The course of training of specialists on dietetics and nutrition are held with participation of the department of dietetics and nutrition, Russian Medical Academy of Post-Diploma Education (Moscow). The course of training was taken by more than 200 employees from children medical-prophylactic institutions, medical institutions of higher and specialized secondary education, as well as workers of research institutes. For the last 5 years, 5 doctors in dietetics were trained in courses of professional retraining by the Ministry of Healthcare of the Republic of Sakha, 144 h thematic advanced training course *Modern Aspects of Nutrition of a Sick and Healthy Child* was held by the department of pediatrics with the courses of gastroenterology, nutrition, and dietetics, the Russian Research Medical University named after N.I. Pirogov, two webinars on important issues of children's nutrition (Kranskoyarsk State Medical University named after Voyno-Ysenetskiy), several elective cycles were held.

According to the Order of Dietetic Aid for Population, nutritionistrooms providing consulting and diagnostic aid to children have been organized. Within the framework of implementation of measures on modernization of healthcare, the Order of Providing Nutrition Aid to Children and Adolescents has been developed.

Informative and educational work on formation of healthy lifestyle including healthy eating is held through the network of Departments of Medical Prophylaxis and Centers of Health of the Ministry of Healthcare of the Republic of Sakha (Yakutia). Mobile expedition consulting-diagnostic work on estimation of health and nutrition statuses is held. The programs of the School of Health involving certain educational courses School of Healthy Eating and School of Brest Feeding have been introduced for medical workers and population.

Important are issues of nutrition arrangement at educational institutions and welfare teams. There arises a question of optimization of nutrition in organized collectives. Ministry of Education of the Republic of Sakha (Yakutia) and the Nutrition Center, Research Institute of Health, North-Eastern Federal University are elaborating a system of modernization of children's nutrition in preschool-school educational institutions, 24-day uniform menus for school meals and 21-day uniform menus for sanitary educational centers of the republic are being introduced. A pilot set is the Republican center for recreation and sanitation of children SosnoviyBor ("Pine Wood").

A systematic work on issues of analysis, systematization, and control of meals arrangement at educational institutions is underway. An active work on automated monitoring of nutrition system of children and adolescents studying at educational organizations of the Republic of Sakha (Yakutia) is perofrmed. The educational-instructional guide book "Nutrition of Children and Adolescents Studying in Educational Organizations of the Republic of Sakha (Yakutia)" published by employees of the Nutrition Center, Research Institute of Health, North-Eastern Federal University is for now a reference book for medical and pedagogical workers of educational organizations. The guide book is a winner of all-Russian and international exhibitions and is the best educational-instructional guide book of Russia, it is included into the database of the Russian Index of Scientific Citation with a high impact-factor. According to the Agreements on Mutual Cooperation between the Center SosnoviyBor and Health Center of the Ministry of Healthcare of the Republic of Sakha, as well as the Research Institute of Health, North-Eastern Federal University for Scientific-Methodical Support, innovative health-protecting and health-developing programs of revival and promotion of healthy eating are implemented. The republican center of recreation and sanitation of children SosnoviyBor is an innovative venue. It was proved by the joint I republican forum for medical workers and workers of nutrition units of educational organizations *Let us Keep our Health* in Yakutsk organized by the Ministry of Healthcare of the Republic of Sakha (Yakutia), the Ministry of Education of the Republic of Sakha (Yakutia), and the Nutrition Center, Research Institute of Health, the North-Eastern Federal University with participation of representatives of departments of higher and specialized secondary institutions of medical education of the North-Eastern Federal University named after M.K. Ammosov and Krasnoyarsk State Medical University named after professor Voyno-Yasenetskiy. Information about the conducted work is reflected in the Proceedings of the Forum.

Thus, at present, the Sakha Republic witnesses a number of problems of provision of children and teenagers with high quality food at various levels. To solve these problems, integrated systematic work on optimization of nutrition of children and adolescentsand modernization of nutrition in organized children collectives is held, also free food for families with infants a charity is available. The conducted work is most effective in development of skills and culture of healthy lifestyle and eating, keeping and promotion of health of children and adolescents in the Republic of Sakha (Yakutia).

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Epidemiological and Hygienic Aspects of Nutrition at Educational Institutions in Sakha Republic (Yakutia)

Introduction

Educational institutions make the only system of public education which covers all children and adolescents of the country during a long period of time. The pupils spend the most part of a day (more than 70%) at school. The time of their education coincides with the period of physical growth and development when a child's body is most sensitive to impacts of the external environment. High growth rates and intensive metabolism demand constant and sufficient inflow of nutrients with food.

But recent research conducted by the Research Institute of Nutrition in various Russian regions show that the children and adolescent diet significantly lacks a whole range of nutrients, including vitamins A,C, B2, iron, calcium, iodine, polyunsaturated fatty acids, and dietary fiber. Resulting from dietary disorders, the health state and anthropometric characteristics of children and youths deteriorate significantly. Health indices of students start deteriorating at elementary school. Presently, less than 5% of elementary school pupils are considered absolutely healthy. In senior grades, absolutely health pupils make about 2% [1].

The Sakha Republic (Yakutia) is the largest Russian region in terms of its territory and has the lowest population density; in 2012, its population was 955.5 thousand people, including 620.5 thousand urban residents and 335.9 thousand rural residents. In 2012, the natural population increase equaled to 8.0 thousand people. The demographic indexes in the Sakha Republic (Yakutia) have increased twice as compared with those of 2000, notably, the natural population growth index (per 1000 people) was 4.0 in 2000 and 8.5 in 2012 [2].

In 2013, common sickness rates among children aged 0 through 18 years decreased by 10.2 per 1000 children compared with rates in 2012. In 2013, the occurrence of digestive system diseases among children increased by 20.4 per 1000 children compared with the data for 2012 [3].

Feeding children and adolescents with high-quality food, especially, at educational institutions is one of the most important issues in regions under extreme climates, where many families have low income and the structure of population feeding has specific regional features.

Nutritional deficiencies and high sickness prevail among school-aged children in the Sakha Republic (Yakutia).

In the Sakha Republic (Yakutia), nutritional deficiencies and high sickness persistently prevail among school-aged children and adolescents. In this respect, epidemiological and hygienic aspects of conditions for education and feeding in educational institutions in the Sakha Republic (Yakutia) play a vital role.

Objectives. Assessment of feeding and food value of daily and school ration of children and adolescents studying in Sakha educational institutions.

Research Data An assessment of meals and eating habits was conducted based on the individual interviewing of children and adolescents in accordance with the international research standards of the WHO National Program on integrated prophylaxis of non-infectious diseases CINDI (European Regional Bureau, WHO,

Copenhagen 2003). A special questionnaire developed by the State Research Center for Applied Medicine of the Ministry of Health and of the Russian Federation and the Research Institute for Nutrition was applied in the survey, it was adapted by researchers of the Center for Nutrition, Research Institute for Health, North Eastern Federal University named after M.K.Ammosov, to children and adolescents in accordance with the local conditions. «24 h – recall» method was used to study meals patterns. Calculation of food variety and the chemical composition of food was performed in the laboratory for study of structure and planning of meals of the Research Institute of Nutrition.

The following documents were used in this research: the annual report (Form № 18) "Information on Sanitary Conditions in Russian Federation Regions" in 2011-2013; the state report "On Sanitary and Epidemiological Wellbeing of Population in Russian Federation in 2012"; the state report "On Sanitary and Epidemiological Wellbeing of Population in Russian Federation in 2013";

Research Results

The assessment of food intake by urban and rural schoolchildren showed that the calorie content of their daily ration was 2011 kcal and 1588 kcal, accordingly (the daily norm – 2675 kcal/ day). The survey also revealed insufficient intake of macronutrients (proteins, fats, and hydrocarbons) with food by schoolchildren. On average, urban and rural schoolchildren take in from food only 14% of the recommended doze of protein, 33% and 30% of fat, and 54% and 57% of hydrocarbons.

Thus, the protein contribution to the caloric content of the ration is lower than the recommended values which, in its turn, does not correspond to the protein intake norms recommended by the Research Institute of Nutrition for northern areas. The share of carbohydrates made more than 50% among rural and urban schoolchildren. The fat portion in urban schoolchildren's diets was higher as compared with that of rural children (Table 1).

Table 1

Calorie value of protein, fats, and carbohydrates %, n=1569

Macronutrients	Recommended values	Urban area (n=958)	Rural area (n=611)
Proteins	no less than 15	14	14
Fats	no more than 30	33	30
Carbohydrates	less than 50	54	57

Average daily intake of vitamins by urban and rural schoolchildren made: B_1 – 61.5% and 46.1%, B_2 – 73.3% and 53.3%, PP – 55% и 45% of recommended values. We have also found out insufficient intake of vitamin A with food in rural schoolchildren ration (4 times less than recommended values).

An average daily intake of vitamin C by urban schoolchildren was 10 mg/day less than recommended norms, and among rural children it was 12 mg higher than the recommended norm. It should be noted here that during the survey, tea with vitamin C was included into the ration of schoolchildren in rural areas (table 2).

Table 2

Average daily consumption of main vitamins, mg per day, n=1569

Vitamins	Recommended doze	Yakutsk (n=958)	Maya (n=611)
A	0.8-1	0.8	0.2
$B_{1,}$	1.3-1.5	0.8	0.6
B_2	1.5	1.1	0.8
PP	17-20	11	9
C	70	60	82
Retinolum, retinolum equivalent	800	641	548

Daily Ca intake among urban and rural schoolchildren made accordingly 50.9% and 32.2%, Mg – 76.3% and 58.6%, Fe – 75.8% and 57.7%, K - 77% and 62.5% of the recommended requirements. Daily Na intake by urban and rural schoolchildren is by 1.5 and 1.3 higher than the recommended requirements (Table 3). Excessive Na intake is connected with consumption of excessive amounts of table salt.

Table 3

Daily consumption of major minerals, mg per day, n=1569

Minerals	Recommended intake	Yakutsk (n=958)	Maya (n=611)
Fe	15-18	13	13
Ca	1200	610	387
Mg	300	229	176
P	1800	986	750
K	3000	2311	1876
Na	2000	3037	2724

Grouping the Sakha children and adolescent institutions into divisions depending on the sanitary and epidemiological well-being indicates the tendency to improvements. For the last 3years, the portion of children and adolescent institutions with inadequate sanitary and epidemiological well-being (3^{rd} group) has decreased by 3, while the portion of children and adolescent institutions of the 1^{st} group has increased by 3.6 (table 4) [5].

Table 4

Division of children and adolescent institutions into groups by sanitary and epidemiological well-being (SEW), Sakha Republic (Yakutia), 2011- 2013, number / (%)

Groups SEW / year	2011	2012	2013
1st group SEW	481 (20%)	505 (21%)	569 (23.6%)
2nd group SEW	1792 (73%)	1744 (73%)	1711 (71%)
3rd group SEW	188 (7%)	151 (6%)	125 (5%)

The improvement stated above reveals updated infrastructure, annual work on construction, re-construction, and repair of buildings. Today, 65% of schools have standard buildings, and 67% of schools are located in wood-log buildings. In this context, introduction of new federal state educational standards of general education and sanitary norms pose high demands for the content, conditions, and results of the educational process, educational specialists and authorities qualification upgrading methods.

Provision of schoolchildren with healthy and safe meals is a priority task of state sanitary and epidemiological supervision during the last years.

In 2013, the proportion of school children provided with hot meals increased from 97% to 99% (in the Russian Federation it made 85.1%) (Table 50). Hot meals provision by age groups makes: 100% (in the Russian Federation – 95.4%) –1- 4 grades; 99.2% (in the Russian Federation – 77.5%) –5-11 grades. In 2013, 58% of school children in the Sakha Republic (Yakutia) were provided with school meals twice a day (in the Russian Federation – 26.6.%), which is by 8% higher than rates in 2012 [3, 4].

Table 5

Provision of School Children with Hot Meals, %

Provision of Children in Educational Institutions	2011	2012	2013
Total	96.8	97.2	99
1-4 grades	98.6	99.4	100
5- 11 grades	95.7	95.8	99.2

The health index of school children serves as an index of effectiveness of school meal management. The proportion of school children of 3-5 health groups, i.e. children with chronic diseases, in schools with hot meal service makes 13% (in the Russian Federation – 21.5%), including: in secondary schools - 12% (in the Russian Federation – 31.8%), in general schools – 0.4% (in the Russian Federation - 11%), in elementary schools – 0.4% (in the Russian Federation – 7.5%); by grades – in the first grade, the proportion of children with chronic diseases makes 5% (in the Russian Federation – 16.3%), in the second grade- 7% (in the Russian Federation -24.8%), in the third grade- 1% (in the Russian Federation – 19.2%) [3].

During 2011-2013, the proportion of ready-to eat food which do not comply with the hygienic norms of sanitary – chemical and microbiological indexes decreased by 0.3% and 1.0%, respectively. The share of food samples which does not meet the norms by their calorific content and amount of Vitamin C has increased by 11.2% (Table 6) [5].

Table 6

Hygienic Characteristics of Ready–to-Eat Food in Children and Adolescent Institutions (%)

Indices	Share of samples not meeting standards, %		
	2011	2012	2013
Sanitary and Chemical	3.5	3.2	3.2
Micro-biological	9.7	8.7	8.7
Calorific and vitamin content	12	13.6	13.6
Vitamin C content	18.7	29.9	29.9

Major problems in meals service in at educational institutions are:

- inadequate quality of material and technical base, and technological equipment of school kitchens at some educational institutions;
- the problem of hot and cold water supply of rural school kitchens;
- absence of school meal combine
- disparity between school meals ration and physiological demands of children;
- inadequate development of the transportation infrastructure in the Sakha Republic, food products are delivered to remote northern regions only during the short period of navigation or by air transports, which complicates food product delivery and meals service at schools;
- shortage of school kitchen and medical workers [3].

Conclusions. Thus, the results of the research of epidemiological and hygienic aspects of meals, carried out in the Sakha Republic (Yakutia), have defined the character and specific features of children and adolescent nutrition in general and in organized groups. In recent years, the results of the research were used to draft the Concept of State Policy on Healthy Nutrition and "The Plan of Major Events, 2020", and to establish the Sakha Republic Children Recreation and Health Center "Sosnovyi Bor' ("Piny Wood"). The Center in association with the Nutrition Center, Health Research Institute, M.K.Ammosov North-Eastern Federal University is a coordinator of activities on nutrition promotion in the Sakha Republic (Yakutia).

Results of epidemiological and hygienic research have laid the foundation for up-grading school feeding in the Sakha Republic (Yakutia) within the framework of the federal program.

The Research has been conducted within the framework of the state task of the Education Ministry of the Russian Federation №3048.

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Dynamics of Amino Acids Excretion in Children and Adolescents using a new milk product 'Standard Growth Formula'.

The investigation of amino acids content in urine and assessment of effectiveness of the product «Growth Formula Standard» in nutrition of students was done. As it is shown the lack of basic amino acids in body slows down growth, mental capacity, development and hormonal maturation of organism. This is especially important during adolescence. The minerals and vitamins contained in the product «Formula Growth Standard» undoubtedly affect the change in the digestibility of amino acids. The introduction of a specialized product with the composition of amino acids in combination with vitamins and minerals resulted in height and weight increase, which indicated the efficiency of its use among schoolchildren.

Keywords: amino acids, children with growth retardation, specialized dairy products.

INTRODUCTION

Properly organized nutrition is very important for the normal physical and psychological development of the student. With food the child should receive the substances necessary for the construction of tissue - protein, fat, carbohydrates, minerals, vitamins [5]. Amino acids (AA) are the basic building blocks of every living cell. AA - the most important component of plant and animal origin, which play an important role in metabolism in the body: the formation of proteins and peptides in the biochemical synthesis of vitamins, hormones, enzymes. A particularly important role is played in the formation of the AA growing organism and adolescents in puberty. Stake muscle accounts for 50% of the total amount of free AA. Maintaining a constant concentration of amino acids in between meals depends on how balanced the power of the child in school and at home. It is important to the quality of the incoming protein.

Hitherto amino acid analysis in clinical diagnostics is mainly used for the detection of inherited diseases and metabolic disorders. However, the study of the amino acid composition of the urine is of great importance, especially in medicine, pharmaceutics. Amino acid analysis gives an accurate value of the content of AA in the protein, whereas the protein determination according to the amount of nitrogen may lead to erroneous results. [1]. Objective: To investigate the levels of AA in the urine, and to evaluate the effectiveness of the product "Formula Growth Standard" in the nutrition of students.

MATERIALS AND METHODS

The study involved 58 students 12 - 13 years who were studying in the school health number 1998 "Lukomorye" Moscow. Among the surveyed children were divided into 3 groups: Group 1 - 20 (normal weight) got milk "Formula Growth Standard" Group 2 (control) - 10 children did not receive "Formula Growth Standard." Group 3 - 14 children (with decreased body weight) were surveyed in the dynamics before and 1 month after the start of the product "Formula Growth Standard." Composition dairy product number given in Table 1.

Table number 1

The composition of the milk product "Formula Growth Standard"

Structure	100 ml of the product	Interconnection constituents active substances with the functions of the body
Vit A, mkg-eq	56	He takes part in the exchange of AK sulfur. Takes part in the synthesis of proteins, lipids, support normal skin and mucosal epithelium. It is a part of many enzymes. With the lack of this vitamin is related metabolic disorders, stunted growth, developing xerophthalmia.
Vit D, mkg	0,3	Participates in the absorption of calcium and phosphate in the intestine. Along with the two essential AA, lysine and L-arginine. Engaged with PTH release of calcium ions from the bone tissue, promotes the differentiation of monocytes and stimulates the immune system in terms of production of macrophages. Vitamin D increases the mineralization of bone matrix. It suppresses parathyroid hormone secretion indirectly via the increase in the concentration of calcium in the blood. It enhances calcium reabsorption in the distal tubules of the kidneys. Deficiency of vitamin D leads to the development of osteoporosis.
Vit E, mg	0,8	It has a strong antioxidant effect especially in the muscles. It participates in the metabolism of proteins, fats, carbohydrates, mineral salts. With a lack of vitamin E in the body muscle myosin is replaced by collagen, violated exchange of minerals, especially calcium and phosphorus metabolism. Increases levels of AA reduces the need for vitimine E.
Vit C mg	4,4	Participates in the regeneration of tissues and bleeding in the formation of collagen, serotonin from tryptophan, catecholamines, and in the synthesis of corticosteroids in immunomodulation (interferon synthesis), in

		the metabolism of phenylalanine and tyrosine proteins. It has antioxidant and antiplatelet properties.
Vit B1, mkg	80	The lack of thiamine leads to the defeat of the central nervous system and peripheral nervous system. Reduced conditioned reflex activity. It participates in the synthesis of methionine.
Vit B2, mkg	90	Lack of riboflavin leads to disruption of metabolism in tissues and organs, the formation of a number of enzymes. Vitamin B2 is needed in the conversion of tryptophane into niacin (vitamin PP).
Niacin, mg	1,0	Normalizes blood cholesterol from the body fills the lack of tryptophan niacin.
Pantothenic acid, mkg	490	Participates in the metabolism of carbohydrates, proteins and fats, it is important to maintain and restore tissue cells, is involved in the reactions which provide energy cell.
Vit B6, mkg	120	Lack of leucine and valine in an organism depends vit B6 shortage.
Vit B12, mkg	0,2	Associated with the exchange of folic acid. Deficiency leads to megaloblastic anemia.
Folic acid, mkg	19	The conversion of serine and glycine play a major role, enzyme cofactors, which are derivatives of folic acid. Lack of folate leads to the development of megaloblastic anemia.
Biotin, mkg	4,5	Coenzyme for carboxylase enzyme involved in the synthesis of fatty acids, isoleucine and valine, and gluconeogenesis. Biotin deficiency leads to alopecia (hair loss), may develop conjunctivitis, scaly dermatitis, neurological development simptomov-depression, apathy, hallucinations, numbness and tingling in the extremities.
|Choline, mg	22	The source of methyl groups (in particular, in the biosynthesis of methionine). In the formation of glycine from serine choline used as a donator of methyl groups along

		with other sources of these compounds.
Taurine, mg	12,5	It is an amino acid. Relieves irritability, anxiety, aggression, promotes the development of the central nervous system in children, reduces the convulsive compensates for heart failure and arrhythmia.
Carnitine, mg	20	The source of energy for muscle tissue, increases the processing of fat into energy and prevents the deposition of fat in the body, enhances the antioxidant action of vitamin C and E. The disadvantage carnitine leads to degeneration, impaired consciousness, appearance heart pains, weakness in the muscles.
Inositol, mg	23	Participates in protein synthesis, amino acid methionine (which is a supplier of methyl groups), necessary for the growth of muscle and bone, it is especially important for children and adolescents. Deficiency leads to deterioration of vision, and hormonal maturation, and further to infertility.
Phosphorus, mg	53	Participates in the enzyme that provides an energy favorable conditions for the reaction. It participates in the formation of phosphoserine that. then serine phosphorylated form.
Magnesium, mg	22	It takes part in the synthesis of aspartic acid. He is an active participant in the work of more than 300 enzymes, including respiratory, membrane transport
Iron, mg	0,8	Iron and histidine are included in the structure of a molecule of hemoglobin. AK cysteine, histidine, lysine digestibility increased Fe.
Zinc, mg	0,8	Zn deficiency leads to disruption of protein synthesis, dwarfism, ovoloseneniyu can cause acrodermatitis, psoriasis, anemia, delayed puberty. Isolation element depends on the cysteine and histidine.
Copper, mg	100	Lack of Cu deficiency is twofold gain

		peroxide processes, impaired transport of ATP. Copper is necessary for the mobilization of the tissue Fe Depot. At deficiency of Cu increased cholesterol, triglycerides, increases the risk of coronary heart disease. AK glycine, histidine, lysine Cu controlled delivery into cells.
Manganese, mg	100	It is essential for brain function and bone formation. It is necessary for normal insulin secretion. Interacts with choline Se - a powerful antioxidant that has anti-cancer effect, improves cardiovascular activity.
Chrome, mkg	2,2	Cr plays a role in lipid metabolism, lack of it can lead to the development of atherosclerosis involved in the metabolism of nucleic acids.
Molybdenum, mkg	3,8	It participates in the formation of enzyme complexes with proteins and oxo complexes. Catalyzes reactions associated with the exchange of complex proteins.
Selenium, mkg	3,8	Involved in the formation of proteins and nucleic acids and enzymes. Included in particular in the active site - glutationpiroksidazy (selenocysteine). Selenomethionine - the main natural source of selenium for the human organism. Vitamin C and vitamin E contribute to a better absorption of selenium. Lack of selenium leads to disruption of cellular integrity, disruption of thyroid hormone metabolism, enhance the toxic effect of heavy metals.

The daily urine amino acid spectrum was analyzed at the children involved in the study. The urine was collected by conventional rules. A portion of the acidified urine sulphosalicylic acid (SSA) and left in the refrigerator to stabilize the amino acids in the sample. Then it was centrifuged for 10 minutes at 3000 g in a centrifuge speed with cooling company Beckman Coulter (USA). The supernatant solution was diluted sample diluent in a ratio of 1: 1. 1 ml samples were prepared and placed in an amino acid analyzer firm KNAUER (Germany). In automatic amino acid analyzer AA reaction occurs with ninhydrin, wherein the color intensity is

directly proportional to the number of AA in the sample. The principle of the method is based on liquid chromatography-tandem mass spectrometry. Value indicators AA urine expressed in mol / mol creatinine.

RESULTS

When comparing the data obtained from the urine of adolescents groups 1 and 2 (see table number 2) found that students who received the product, decreased urinary excretion of AA, as aspartic acid, glutamic acid, alanine, valine, isoleucine, phenylalanine, homocysteine, arginine. This may indicate a better absorption AA body under the influence of trace elements and vitamins that are part of the specialized dairy product.

Table 2

Effect of receiving product "Standard Growth Formula" amino acids excretion

Amino acids	Group 1 received M ± m	Group 2 received no M ± m	confidence index
	product "Formula Growth Standard"		
Aspartic acid	0,5±1,5	1,02±0,1	p ≤ 0,1
Threonine	10,8±0,8	9,1±0,9	-
Serin	24,5±4,0	23,0±1,5	-
Glutamic acid	5,5±0,8	6,7±0,3	P ≤ 0,1
Glutamine	144,0±13,8	158,2±10,2	-
Alanine	16,7±1,9	19,8±1,9	P ≤ 0,1
Valine	3,4±0,4	4,1±0,3	p ≤ 0,1
Cystine	4,4±0,7	4,6±0,4	-
Methionine	2,5±0,3	1,9±0,2	-
Isoleucine	2,8±0,5	4,6±0,4	p ≤ 0,05
Leucine	6,6±0,9	2,8±0,1	p ≤ 0,05
Tyrosine	9,9±0,9	11,1±1,4	-
Phenylalanine	5,5±0,4	6,8±0,3	p ≤ 0,01
Homocystine	1,0±0,4	3,5±1,6	p ≤ 0,05
Ethanolamine	32,1±2,6	30,9±1,6	-
Tryptopan	4,8±0,4	5,8±0,5	-
Ornithine	2,5±0,4	2,8±0,4	-
Lysine	15,8±3,3	9,0±1,8	p ≤ 0,05
Histidine	103,7±24,8	53,9±8,2	p≤ 0,05
Aginine	119,3±31,0	161,5±29,0	p ≤ 0,05
Glycine	77,4±11,2	68,0±14,0	-

AA urine excretion was higher in adolescents who did not receive milk, which may indicate a lack of digestibility of AA in children and adolescents in the period of active growth (and / or children with growth retardation) may also associated with a deficit of trace elements and vitamins. Since it is known that valine is an energy source for muscle cells, it affects the level of serotonin in the body. In insufficient intake of vitamin B6 the level of valine in the body was reduced.

Lack of valine in an organism in turn causes ataxia, hyperesthesia. [4]. With a low content in the body of isoleucine somnolence, may decrease blood sugar (hypoglycemia), and the deficit as a consequence of lost muscle mass, impaired kidney function and thyroid. Glycine is required for the formation of connective tissue. With a lack of glycine connective tissue weakens. It participates in the brain and throughout the nervous system. With a lack of glycine, there is irritability, undue anxiety, nervousness and irritability. Phenylalanine accelerates the production of protein stimulates the removal of metabolic products of the liver and kidneys, controls the rate of metabolism and many other processes are also involved in the formation of replaceable AA - tyrosine. Furthermore, phenylalanine is involved in the formation of thyroid hormones, which is especially important during adolescence at the school.

In the group of students who did not receive specialized product, it was reduced urinary excretion of leucine. The main purpose of leucine is the construction and growth of muscle tissue, the formation of the protein in muscle and liver. Leucine prevents destruction of the protein molecules, it can also serve as an energy source for the organism. The lack of leucine, this is the result of poor nutrition or lack of vitamin B6 in the body. Lowering the excretion of Aa may be indicative of a general shortage of AA in these children. The third group included 14 adolescents (n = 14) underweight. This group conducted a study of excretion in the urine AA before and 1 month after receiving the "Formula Growth Standard." Table 3 shows the number of amino acids excretion in the urine. It was found that the additional inclusion in the diet of children's product "growth formula Standard" has led to a change in most of excretion AA, especially essential AA (Table number 3).

Table 3

The dynamics of the renal excretion of essential AA in patients receiving specialized dairy product "Formula Growth Standard"

Amino acids irreplaceable	Before receiving M ± m	After receiving M ± m	Significance of differences
	product "Formula Growth Standard"		
Methionine	3,6±0,5	2,0±0,2	P ≤ 0,01
Leucine	7,9±0,8	3,7±0,4	P ≤ 0,05
Lysine	13,4±3,4	8,1±0,9	P ≤ 0,05
Isoleucine	1,9±0,3	5,5±0,8	P ≤ 0,05
Histidine	99,9±20,4	54,4±6,8	P ≤ 0,05

There was a significant increase in essential digestibility of AA: methionine, leucine, lysine, directly involved in bone growth and increase in muscle mass of an organism. Methionine is known to help rapidly growing organism to extract energy from fat and ensures normal functioning of the liver. With lack of methionine in the body the development of atherosclerosis, adrenal insufficiency, deficiency of choline and adrenaline are detected. Leucine, moreover, prevents the decrease in the level of serotonin, causing the body is less prone to fatigue. Thus, reducing the excretion of leucine can be attributed to positive results. At the same time the excretion of essential AA increases isoleucine, which prevents lethargy and sleepiness, which is also a welcome sign, and indicates sufficient supply of isoleucine in the baby food. . Teenage body between hormonal aging and difficult adjustment of all functions and systems become more employable as a sufficient absorption of sugar, which is also dependent on the performance of pupils isoleucine increases during the training, activating the functional efficiency of the brain. In

children, there is increased activity of mental activity, improves mood, marked by activity in the behavior. There were no changes in the urinary excretion of essential AA is tryptophan, phenylalanine, valine, threonine.

The study revealed some change in the excretion replaceable AA. After 1 month in the group 3 after receiving the product "Formula Growth Standard" in urine excretion of AA decreased, as serine, glutamine acid, alanine, cysteine, tyrosine, glycine, which may indicate their better digestibility. Simultaneously slightly increased urinary excretion: aspartic acid, valine, isoleucine, arginine. This may indicate a sufficient supply of AA in the body of schoolchildren (Table 4).

Table 4

Effect of receiving product "Formula Growth Standard"
on the urinary excretion of replaceable AA

Amino acids interchangeable	Before receiving the M ± m	After receiving the M ± m	The significance of differences
	product "Formula Growth Standard"		
Glycine	107,8±16,6	68,3±7,2	P ≤ 0,05
Carnosine	12,9±1,2	9,4±0,8.	P ≤ 0,05
Aspartic acid	0,0±0,0	1,6±0,3	P ≤ 0,05

As can be seen from the table number 4, as a result of months of supplementation product "Formula Growth Standard" decreased urinary excretion of AA-essential such as glycine and carnosine. An increased excretion of aspartic acid. Before receiving this milk AA is detectable in urine. This fact may indicate that the elimination of the deficit of the AA in the body. It is known that the aspartic acid is a neurotransmitter necessary for normal functioning of the brain, particularly in children during the training period, increased teaching load and assimilation of large amounts of educational material. Another feature of the aspartic acid is its ability to increase cell membrane permeability to potassium ions and magnesium. Aspartic acid is a kind of "pulls" potassium and magnesium inside the cell. As a result, increases physical endurance and performance of the body. Aspartic acid is particularly advantageous effect on the heart muscle.

RESULTS AND DISCUSSION

Essential AA only enter the body with food. They can not be synthesized by the body but are essential for the normal life of the child. With a lack of protein in the diet of the child there is a weakness, it becomes sluggish, poorly gaining weight and growth, reduced its resistance to infections. [3,4]. Reduced working capacity, which is reflected in its performance.

The disadvantage, especially essential, AA in the body slows down growth, mental capacity, development and maturation of the body's hormonal. This is especially important during adolescence. [3].

The role of glutamic acid in children is the formation of enzymes to restore functionality tired muscles, and metabolism in the brain. Glutamic acid has the ability to bind and neutralize the ammonia, which is a strong poison for the nervous tissue.

The change in the digestibility of AA, of course, affect the minerals and vitamins contained in the product "Formula Growth Standard." Product Introduction specialized, with the composition of AA in conjunction with minerals and vitamins resulted in an increase in height and weight, which indicates the efficiency of its use among schoolchildren (Table №5).

Table 5

Changing length and weight of students in dynamics on the background of the product "Standard Growth Formula "

Children underweight, take the product (n = 14) group number 3			
Index	Before receiving the M ± m	After receiving the M ± m	reliability
body length , cm	155,85±1,8	161,83±2,0	P ≤ 0,01
Body weight, cm	40,5±0,9	46,3±1,67	P ≤ 0,01

AA are of great importance and considered to be the main products in the development of the organism. For normal operation, the liver and the intestine into the child's body are needed in large quantities of alanine and glutamine and methionine, i.e. AA supplied from the bloodstream into muscle and released from the muscle tissue. For normal kidney function are serine, alanine, glutamine, proline and glycine. For normal operation of the brain valine, phenylalanine is needed. A sufficient number of incoming AC to the baby helps to overcome physical and psychological stress and become children and adolescents to stress.

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Obesity in the Yakutia Children: Socio-Hygienic Aspects and ClinicalCharacteristics

ABSTRACT

The results of social-hygienic and clinical researches of children with obesity are given in the article. The sociological method was based oninterviewing. For the disclosure of social and hygienic characteristics of the child population a questionnaire consisting of three main blocks: sociodemographic, lifestyle, and genetics has been developed. The clinical method included anthropometrical measurements, clinical examination and biochemical test. Our clinical research showed that obesity of the I degree prevailed, and more often - among boys. The abdominal type of obesity was observed in 86% of children. One case of a metabolic syndrome was revealed.

Keywords: overweight, obesity, a metabolic syndrome, children, teenagers, fats, a carbohydrate range, prevalence, low body weight at the birth

INTRODUCTION

Obesity at children and teenagers refers to the most important medical-social problems of our modern society [1,2,4,6]. Along with the spread of obesity the serious somatic illness associated with it increases: diabetes mellitus (DM) of the 2nd type, arterial hypertension, coronary heart disease, atherosclerosis, oncological diseases and others. 2,5 million people die of the diseases connected with obesity in the world every year. Overweight in children's and teenage age is often transformed to obesity in adults which, in turn, represents serious threat for health [1,4,6]. According to WHO, the overweight and obesity are defined as "the pathological or excess accumulation of fat representing risk for health". There are cases of family obesity with the inheritance coefficient of 25% that testifies to a rather high influence of genetic factors in the development of this disease [1,2,4]. Despite the possible genetic and environmental factors of obesity, the cause of body overweight and obesity is always caused by two factors: excess nutrients with food and low level of the physical activity which isn't allowing spending the amount of energy of food.

The purpose of our research is social-hygienic and clinical trial of the children and teenagers with obesity living in Yakutsk.

MATERIALS AND METHODS

73 children at the age of 8-17 years took part in the research. All children lived in Yakutsk. Clinical and sociological methods of research have been used. The clinical method included anthropometrical measurements, clinical examination and biochemical test. The sociological method was based on interviewing. Children of 14 years old and younger were interviewed together with their parents. All researches were done after receiving the informed agreement.

For sociological research we have developed the questionnaire consisting of 32 questions grouped in 3 blocks:

1. Social and demographic (12): age, family, financial position of the family, age of parents, education of parents.

2. Way of life (13): food, physical activity, health.

3. Genetics (7): hereditary predisposition to diseases.

Clinical examination of all respondents was conducted for the purpose of identification of deviations in health.

The anthropometrical measurements with determination of growth, body weight, the body weight index (BWI), waist measurement (WM), Hip-Ratio (HR), Waist-To-Hip-Ratio were done in all children and teenagers. Also, arterial pressure was measured and laboratory diagnostics from biochemical indicators of blood was carried out: triglycerides, cholesterol, high density lipoprotein and level of glucose.

The body mass index was calculated for the assessment of level of body overweight and obesity and it was estimated with the help the percentile tables for a definite age and sex (WHO, 2007). BWI between 15 and 85 percentiles was considered to be normal, BWI within 85-97 percentile was estimated as overweight, over 97 percentile – as obesity.

The waist measurement was taken according to WHO recommendations by measuring tape horizontally in the middle between bottom edge of costal arch and iliac bone. The volume of hips was measured horizontally in the widest place of hips. To compensate the differing extent of development and ethnic origin in children's and teenage groups, the preference was given to percentile, but not to absolute values of waist measurement where ≥90% percentile showed abdominal type of obesity by IDF criterion. The arterial pressure was measured by Korotkov's method on both hands sitting 5 minutes rest later, MSSBP and MDIA were taken for the analysis, after triple measurement we took mean value of systolic and diastolic pressure.

Blood test was carried out on empty stomach after night starvation in laboratories of children's city hospital where such indicators as cholesterol, triglycerides (Triglyceride ФС № ФСР 2009/04744), high density lipoprotein (HDL – Cholesterol – Nova № B8024), and glucose level of empty stomach and after 2 hour activity by means of glucose oxidase test (Novogluk – K, M (500) №B-8005) were considered.

The body mass index was calculated with the formula: The body weight (kg)/height (m ²), where the criterion of obesity of the I degree was 25-29,9, the II degree – 30-39,9, the III degree – ≥40, (Litvitsky P.F.). Other indicators were checked according to criteria of the international association of diabetes (IDF - International Diabetes Federation) where abdominal obesity was considered according to the percentile table ≥90% percentile; arterial pressure ≥130-85; level of triglycerides ≥1,7 mmol/l; LPVP of ≤1,03 mmol/l; glucose level in 2 hours after acxtivity ≥5,6 mmol/l. Children at the age of 10 years were also possible to diagnose a metabolic syndrome of abdominal obesity and existence of two or more other components (the increased level of triglycerides and the lowered level of cholesterol of lipoprotein of the low density (LPNP), high arterial pressure, the increased glucose level in blood).

RESULTS AND DISCUSSION

Totally 73 children at the age of 8-17 years have been examined. Boys - 61,7%, girls – 38,3%. Average age of children was 11,8 ±0,5 years.

The analysis of the social and demographic characteristic of the children has revealed that the social and economic status of families were the following: 42,8% normal living wage, 34,2% - low living wage and 22,8% - above. Most children live in the full families (63,2%) with 1 child (73,4% bring up 1-2 children). Average age of

parents among fathers was 43,2±0,8 years old, among mothers - 38,6±0,7 years old. The education of parents were 60% special secondary education, 35,7% higher education, 2,8%, incomplete higher education, 1,4% incomplete secondary education.

Nowadays we absolutely know and obtained enough data confirming the unique value of breast milk for feeding of the newborn. The low protein and energy received with breast milk in comparison with artificial mix reduce release of insulin and thus influence on fat adjournment and obesity. According to the researchers, breastfeeding can strengthen long-term protection against developing of diabetes of the 2nd type in connection with the low level of glucose and concentration of insulin in blood serum in babies and minimum low level of insulin in the future [3]. The questions of breastfeeding were included in the block of way of life for the purpose of detection of this risk factor. The analysis has established that only 15% of respondents were on full breastfeeding till 1-1,5 years. Short breastfeeding (till 3 months) was in 31,5%, till 6-9 months - 23,3%. The others 30,1% of children were on artificial feeding.

As a result of diet assessment it was established that we met voluntary regime more often than systemic one. Only 2,9% of respondents have meal in certain hours. Quality of food depends not only on a set and capacity of food, but also on hot meal during a day, good breakfast. So, only 28,8% of children eat thermally processed food three times during a day in certain hours. 52,4% of children had double meals and 18,8% – single hot meal.

The distinctions in breakfast value among children and teenagers were noted. Children of younger and middle school age had breakfast 3 times more often than teenagers.

The most common causes of irrationality and imbalance of food was lack of time, lot's of additional classes, faculties and absence of parents at home (there was nobody to cook dishes).

American scientists have proved that products of tobacco burning lead to a metabolic disorder in cells that will lower sensitivity to insulin hormone action. It leads to the increase of glucose level in the blood and overweight. Thus, passive smoking belongs to one of factors of development of obesity. In our research, 34,2% of respondents are subject to continuous influence of tobacco smoke. 17,8% of mothers smoked in the I trimester of pregnancy, 9,6% - in the II trimester and 6,9% throughout all pregnancy.

Assessment of negative influence of environment factors on the baby in the antental period of development showed that 47,1% of mothers had an adverse course of pregnancy. The greatest number of pathologies were shown in the form of toxicosis of moderate severity and SARS (12,8% in both cases), 8,5% of mothers early terms of pregnancy were proceeded with gestosis, 2,8% with abortion threat.

Adverse intranatal period was characterized by operational childbirth in 24,7% of mothers, prompt childbirth – in 11,4%, childbirth with stimulation – in 8,5%, the tightened childbirth – in 1,4%.

The role of hereditary predisposition in the development of obesity doesn't raise doubts: statistical data testify that obesity in children, whose parents have no overweight, develops approximately in 14% of cases, and in children when both parents have obesity – in 80% of cases [5]. Obesity arises not only since the childhood, the probability of its development remains throughout all life. In our case the hereditary load of the overweight and obesity in both lines of relationship was 47%, by mother line - 36%, by father line - 17%. Thus, the hereditary load of the body overweight and obesity was available for each child.

The theory of fetal causes origin (fetal origins hypothesis) of the development of obesity has the increasing popularity within the last several years. It was established that the high body weight of the newborn contributes to the future body overweight. According to the study, 26% of children were born with the body weight higher than 4000 grams at the birth.

Three critical periods are distinguished in the development of child's organism: early child's age, preschool age and period of puberty. Active development of fatty depots happens these years with the frequency of the development of obesity increase. In our experimental group the greatest number of children (41%) started gaining overweight in the period of younger school age. At preschool age overweight was gained by 21%, 12,3% of children – at early children's age.

The clinical part of the research has revealed obesity of the I degree in 64% of children, among girls – 38%, boys – 62%; The II degree – 34%, among girls – 40%, boys – 60%, the III degree – 2% (one boy). According to percentile tables all children depending on age and sex had higher than 97% percentile. The abdominal type of obesity was observed in 86% of children, among girls – 41%, boys – 59%. High arterial pressure to 145/90 mm Hg was revealed in 5% of children with obesity of the I degree, the II degree – in 1%, the III degree – in 5%.

Complaints generally were: good appetite and fast fatigue. Children with obesity of the II-III degree complained of dyspnea when moderate physical activity, thirst, dyspeptic disorders.

The results of biochemical analysis have revealed the increase of lipoprotein of high density in three children with the I-II degree of obesity, increase of level of triglycerides in one girl with obesity of the II degree, hyperglycemia in two girls with the I-II degree of obesity. One boy of 14 years old had the metabolic syndrome according to criteria of IDF.

This article is a fragment of complex research of children with obesity, our research and the analysis of materials is being proceeded.

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Physical Development and Features of Nutrition of Children with Urinary Diseases

ABSTRACT

The aim of the study was to evaluate the physical development and diet of children with diseases of the urinary system. According to the results of the study it was found that children with diseases of the urinary system lagged behind their healthy peers on anthropometric parameters. At the analysis of the patient's body weight deviations from recommended one it was revealed that in the majority of patients of the main group mild to moderate malnutrition degrees were noted. At comparing the diets, it was noted that low-protein diet helps to reduce the rate of fall in glomerular filtration.

Keywords: children, physical development, diseases of the urinary system, nutrition

Physical development of the growing organism is one of the indicators of child health. The more significant violations in the physical development of the child, the greater the probability of having the disease. [1]

The aim of our study was to evaluate the physical development and diet of children with diseases of the urinary system.

MATERIALS AND METHODS

The study included 34 children. The study involved 17 children with diseases of the urinary system (9 girls and 8 boys) aged 5 to 17 years. By disease children were distributed as follows: chronic glomerulonephritis - 9 children, toxic capillary nephritis - 2, acute glomerulonephritis - 3, tubulointerstitial nephritis - 1, chronic pyelonephritis - 2.

For all the children anthropometry was conducted. Body growth was measured stadiometer accurate to 0.5 cm, body weight was determined on the health scale accurate to 0.1 kg. Head circumference and chest circumference measuring tape measured accurate to 0.5 sm. Skinfold measured triceps.

From growth-weight ratios the Ketle index was used, calculated by the formula: M / L, where M - mass in kilograms, L - height of the individual, measured in meters squared. Normal values range from 20 to 25, below 18 is considered as an indicator of malnutrition above 27 - as obesity. [2]

Also, indicators such as the percentage deviation from the recommended body weight. Decrease in the ratio of body weight/body weight recommended, measured in % to 80% in patients without edema, usually means a slight degree of malnutrition; decrease this value to 70% or less indicates severe malnutrition [4]

To compare the anthropometric data of 17 healthy children were collected. [5]

Children with diseases of the urinary system referred to as "main group" healthy children named as the "control group".

All patients were asked to maintain a food diary.

RESULTS AND DISCUSSION

Glomerular pathology was diagnosed at all children aged 5 years, including 1 child with tubulointerstitial nephritis, 1 - with toxic capillary nephritis glomerulonephritis and 1 child - with chronic glomerulonephritis. Children 6 years: two with chronic pyelonephritis and 2 children - with acute glomerulonephritis. Among children 7 years old 1 child was with acute glomerulonephritis and two - with chronic glomerulonephritis. All children are 14, 15, 16 and 17 years were with chronic glomerulnefritom.

According to the anthropometry children with urinary diseases lag behind their healthy peers in such parameters as body weight, chest circumference, as well as in growth at children up to 7 years (table 1).

In comparison with the norm in children with diseases of the urinary system the lower skinfold thickness is determined (table 2).

We determined Ketle index depending on the type of urinary tract disease in children.

As the table 3 shows all the children were below 18 figures, indicating malnutrition. The lowest rates were in children with chronic pyelonephritis.

We have determined the percentage deviation from the recommended weight children, which is calculated by the formula: m1 × 100% / m2, where m1 - weight of the subject, m2 - recommended body weight (RBW) (table 4,5) .

In the analysis of deviations from the patient's body weight recommended we revealed that male children in the main group one child with severe disease malnutrition was bound at least (body weight less than 70% of the recommended). The majority of patients of the main group had mild to moderate malnutrition. And anyone from the main group had no recommended body weight. In the control group, only two children had a slight degree of malnutrition, the rest of them had recommended body weight. In children, females practically, we observed the same pattern. In children with severe malnutrition hydronephrosis kidney and chronic glomerulonephritis with nephrotic syndrome were observed on the background of chronic pyelonephritis. All patients on the results of additional studies were divided into two groups:

Group 1 - 12 patients who adhered to the prescribed diet;

Group 2 - 5 patients, with a free diet.

All the children were tested for glomerular filtration rate, albumin, calcium and phosphorus in the beginning and end of the survey (table 6).

The evaluation results of protein intake in group 1 showed that patients on average during the observation consumed protein - 0.5 g / kg, in group 2 - 1.1 g / kg per day. The glomerular filtration rate (GFR) was higher in the group of patients with free diet, also there was increase in the level of phosphorus, calcium and albumin reduction.

Conclusion. Thus, as a result of our study we revealed that all children have protein-energy malnutrition of middle and low degrees. According to the anthropometry, children with diseases of the urinary system lag behind their healthy peers on such parameters as body weight, chest circumference and children up to 7 years for growth. In comparison with the norm in children with diseases of the urinary system the lower skinfold thickness is determined. The low-protein diet helps to reduce the incidence rate of GF.

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Table 1. Average anthropometry in the groups studied depending on the age.

Groups	Age, years	Body Weight, kg	Height, sm	Head circumference, sm	Chest circumference, sm
The Main Group	5	17,9	106	54,1	59,3
	6	22,2	126,7	54,3	61,7
	7	25,3	128	53	63,3
	14	50	176	57	71,5
	15	40	153	55	78
	16	48	175	53	86
	17	54,3	161,7	57,7	91
The Control Group	5	21.5	108	54,9	61,7
	6	26,3	127	55,8	63,4
	7	27	129	54	64.5
	14	60,4	176	-	79
	15	66,5	171	-	82
	16	67	175	-	89
	17	68	176	-	94

Table 2. Average skinfold thickness triceps in the groups studied depending on age, in mm

Age, years	thickness of subcutaneous fat layer with the skin	
	Boys	Girls
5	3	2,2
6	2,9	3.2
7	4,2	2
14	2.5	-
15	-	3,2
16	-	3
17	3	2,5

Table 3. Ketle index in the groups studied.

Diagnosis	Number of children й	Ketle index
Chronic glomerulonephritis	9	17,5
Toxic capillary nephritis	2	16,7
Acute glomerulonephritis	3	16,8
Tubulointerstitial nephritis	1	17,3
Chronic pyelonephritis	2	15,4

Table 4. Deviation from the RBW boys

Groups	Recommended body weight	Degree of protein-energy malnutrition (PEM)		
		Weak (> 80% RBW)	Medium (70-80% RBW)	Weight (<70% RBW)
The main (n=8)	0	1	6	1
The control (n=8)	6	2	0	0

Table 5. The deviation from the RBW girls

Groups	Recommended body weight	Degree of protein-energy malnutrition (PEM)		
		Weak (> 80% RBW)	Medium (70-80% RBW)	Weight (<70% RBW)
The main (n=8)	0	2	6	1
The control (n=8)	6	3	0	0

Table 6. Dynamics of laboratory parameters in the groups studied.

Indicators	Group 1 (n=12)	Group 2 (n=5)
Protein intake, g / kg per day	0,5	1,0
Drop Speed GF ml / min per month	0, 30	0,50
Albumin, initially / at the end of the study, g / l	44,3/44,2	43,9/42,9
Calcium initially / at the end of the study, mmol / l	2,41/2,3	2,34/2,0
Phosphorus initially / end of the study, mmol / l	1,60/1,58	1,55/1,80

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Management of Patients' Nutrition in Children's Tuberculosis Sanatorium ofthe Republic Sakha (Yakutia)

ABSTRACT

Analysis of nutrition management of children infected with Mycobacterium tuberculosis, being treated in the children's sanatoria of the Republic Sakha (Yakutia) was done. Data reporting on patients' nutrition management were analyzed, 640 menu-layouts derived from 9 regional children's tuberculosis sanatoria for 2011-2012were studied. In the children's sanatoria of Sakha (Yakutia) Republic discrepancies toRAMS Institute of Nutrition recommended standards of consumption of basic foods, calorie, protein, fat and carbohydrateswere established.

Keywords: tuberculosis, children, nutrition, sanatorium.

INTRODUCTION

The Republic of Sakha (Yakutia) is one of subjects of the Russian Federation, owing to climatic conditions there is high risk of tuberculosis illness among the population. The main attention in the republic is paid to questions of prevention of the disease of tuberculosis among the children's population. Function on prevention of tuberculosis at children is carried out by the children's tubercular sanatorium (CTS). Now in the republic there are 9 regional DTS located mainly in the regional centers of municipalities. The Republican children's tubercular sanatorium of T.P. Dmitriyeva is considered the head establishment on rendering the medical and diagnostic, preventive, rehabilitation help children from risk groups with tuberculosis by the order of Ministry of Health of the Republic of Sakha (Yakutia) No. 01-8/4-101 of March 14, 2007. "About improvement of work of children's tubercular sanatorium in RS (Ya)". This establishment carries out mobile work for the purpose of rendering organizational - methodical and practical help, and also annually analyzes indicators of their activity.

MATERIALS AND METHODS

We analyzed reporting data on catering services of children in 9 children's tubercular sanatoria of the Republic of Sakha (Yakutia) for 2010-2012. The analysis of financing of food article per one patient a day is carried out. Besides, consumption of main food ration in grams per one child a day is estimated. For the purpose of definition of an optimum diet of children in conditions of DTS we estimated food rationof patients by calculation of chemical composition and caloric content of food. In total 640 menus requirements from 9 regional sanatoria for 2011-2012, i.e. actually used for 10 days every quarter were analysed. We also estimated the nutritional and energy value of food of patients in comparison with norms of the Scientific Institute of Food of the Russian Academy of Medical Science (2007) recommended for children with tuberculosis.

In DTS the main contingent of patients included children from risk groups being treated from 3 to 6 months, the age of children generally was from 2 to 14 years.

RESULTS AND DISCUSSION

It is established that in regional DTS due to shortage of dietary sisters, their duties are assigned to senior nurses. Elder sisters make daily menus apportions, control quality of the delivered food, storage and observance of products, and also terms of their realization. Also they control quality of cooking, compliance to physiological needs of children, and also sanitary state of catering department and observance of personal hygiene by workers.

The analysis allowed to reveal the existence of household administrative problems in regional DTS. So, unsatisfactory organization of food provision, low qualification of the personnel of catering departments naturally connected with low wages which is received by this category of workers is noted. Unsatisfactory equipment of catering departments is also established by processing and refrigerating appliances, kitchen stock. The material resources of catering departments in many DTS don't meet requirements, shortage of seats in dining rooms is noted as well.

Catering services in children's tubercular sanatoria, certainly, depend on financing. Data of financial meanson actual food expenses for one bed-day are presented in table 1.

As it is shown from the table in all regional DTS in 2012, except Churapchinsky region there is a tendency to increase a level of financing for food, in comparison with 2010. In general in regional DTS in 2012, in comparison with 2010, the amount of financing of one bed-day increased by 24,2% and averaged 200 rub 14 kopeks.

Results of the analysis of consumption by patients of meat and fish products are presented in table 2.

From the table it is visible that in a number of sanatoria the low level of meat products consumption is noted. So, in Vilyuysky DTS it was 34,4% lower, in comparison with the recommended norm, in Suntarsky – for 35,3%, in Ust-Aldansky – for 25,9%. Meat consumption above the recommended norm is noted in Verkhnevilyuysky and Nyurbinsky DTS where excess of norm made 9,9 and 12,5% respectively.

On consumption of fish production considerably low indicators are noted in Vilyuysky, Ust-Aldansky, Megino-Kangalassky and Tattinsky DTS. The consumption of fish production which was closer to the norm is noted in Suntarsky and Churapchinsky DTS.

Results of the analysis of consumption of dairy and sour-milk products and oils are given in table 3.

Volumes of consumption of milk and sour-milk production in five regional DTS are much lower than the norm recommended to scientific research institute of food of the Russian Academy of Medical Science, were closer to norm is noted in Megino-Kangalassky and Ust-Aldansky DTS, norms almost twice - in Churapchinsky DTS are higher. In all sanatoria absence in a diet of patients of cottage cheese and sour cream is revealed. Cheese appeared in a diet of patients in 2012 almost in all DTS. Creamy and vegetable oil is closer to norm patients in Upper-Vilyuysky, Megino-Kangalassky, Suntarsky and Ust-Aldansky DTS received.

According to the data obtained the main food ration of children in the conditions of regional DTS consists of pasta and grain. Volumes of consumption by patients of these types of products are presented in table 4.

As it is presented in Table, volumes of pasta and grainconsumption considerably exceeded the recommended norm in all regional sanatoria, the lower indices are noted only in Megino-Kangalassky DTS. In Verkhne-Vilyuysky DTSthe parameters exceeded 6 times, in Tattinsky – by 2,7 times, in Churapchinsky – by 2,6 times. Volumes of flour and bread consumption also in the majority of DTS exceeded the recommended norm. Considerable distinctions are also noted in consumption of sugar and confectionery. To sum up, in the majority of children's tubercular sanatoria in the diet of patients essential distinctions are noted.

Fresh vegetables and fruit are one of the most important sources of vitamins B inchildren's organism. We carried out also the analysis of consumption of fruit, vegetables, dried fruits and nuts which results are reflected in table 5.

From Table 5 it is visible that consumption of fresh vegetables in all DTS remains lower in 2011-2012 than the recommended norm, fruit considerable excess is noted inVerkhne-Vilyuysky and Ust-Aldansky DTS, lower norms are in Nyurbinsky DTS.

It is also established that in the daily diet of patients low volumes of consumption of dried fruits in Ust-Aldansky, Churapchinsky, Nyurbinsky and Vilyuysky DTS are noted. Nuts appeared in a diet of patients of Suntarsky and Ust-Aldansky DTS only in 2011, lack of them was still noted inNyurbinsky and Tattinsky DTS.

Results of assessment of nutritional and energy value of products are reflected in Table 6.

It is necessary to pay attention to balance of food, i.e. to the ratio of proteins, fats, carbohydrates and power value, compliance of their quantity to physiological needs of children. When comparing with the recommended norms, insufficient consumption of proteins is noted in three sanatoria: Vilyuysky, Megino-Kangalassky and Ust-Aldansky. In many sanatoria excess of fats and carbohydrates is observed. In comparison with 2011 in Vilyuysky, Churapchinsky and Ust-Aldansky DTS in 2012 the caloric content of food of patients decreased almost by 1,5 times.

CONCLUSION.

The analysis of catering services in regional DTS revealed much moreserious problems. So, in the diet of patients volumes of consumption of the main food have considerable distinctions which testify to the lack of systematic assessment of food of patients. The absence of experts – nutritionists, lack of analysis and control of catering services are the main reasons for these problems. This problem demands attention for the purpose to remedy and reduce compliance with the recommended norms of the Scientific Institute of Food of the Russian Academy of Medical Science.

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The influence of Changing Social Conditions and Diet of Indigenous Population on the Dynamics of the ViluyEncephalomyelitis Epidemic Process

ABSTRACT

The paper presents results of the analysis of traditional food, economic activity and lifestyle in foci of VEM. It shows the influence ofchanging living conditions in the epidemic process of the disease. The positive influence of improving living conditions to reduce the incidence of VEM acute cases VEM, at the same time it creates the problem of diagnosis of the disease in patients with primary chronic form.

Keywords: meningoencephalomyelitis, persistence, immune resistance, socio-economic factors, epidemic process.

INTRODUCTION

A clinical and epidemiological study of Viliuisk encephalomyelitis (VEM) having been conducted intensively since 1950s of the twentieth century to the present, showed that the dynamics of VEM epidemic process demonstrates changes in the ratio of its clinical forms and maintaining relative stability in the General level of the disease. In recent years, the share of the most common progressing cases has reduced and at the same time the number of primary chronic forms of encephalopathy has increased. Quantitatively unequal incidence rate of VEM progressing cases in different periods of time (about 2-3 cases annually in the 1960s, 1 case after 1-4 years in the 1980s, 1 case after 4-5 years in the 2000s) is caused by combination of factors: host susceptibility to the disease state of his immune resistance and feature of ecological niches. VEM pathohistology identified the possibility of self-limiting inflammatory stage, sometimes followed by re-exacerbation of the foci, detected in brain samples of dead from VEM. Self-limiting of brain inflammation in some VEM patients in the chronic stage provided a long period of stabilization during the life of the patients, and the exacerbation occurred against the backdrop of persistent infection [4].

Equally important in understanding the pathogenesis of the VEM, starting with predisposition to the disease, is the study of external and internal environmental factors, particularly dietary habits of the population foci of VEM. To study the dynamics of epidemic process VEM shows the greatest spread of the disease from the some rustic epidemics in Viliuisk area to the Central areas of the Republic in 1950s -70s, clearly associated with migration of the population [3].

The first biomedical understanding of it can be found in the work of T. A. Kolpakova (1933), where in some detail descripted a small group of patients-boskhongoors (<boskhon> is Yakut name of VEM, means <relaxed>) in Mastakh area of Viliusk district. An important assumptions and conclusions) contains in extant records [6] that can be used as starting points in the study of the nature of theVEM. Relying on an even earlier mention of R. Maak[8], who first described similar to VEM individual patients, you can have an idea about the low level of social and living conditions and extreme scarcity of food for the local population Viliuisk district, continuing until the mid-nineteenth century.

Thus, it is possible to see that the VEM had spread for at least a century and a half amid fierce social conditions of life, contributing to low levels of immunity aboriginal population. These conditions persisted and increased in the period of the Second World War and in the 1950-60s, when registered the highest number of acute/subacute forms of VEM [2]. The decline of the epidemic happened since 1980-90 s, in parallel to improving the quality of life of the local population. The study of individual aspects of this phenomenon deserves attention in relation to understanding the mechanisms of susceptibility and the launch of the manifestation of the pathological process VEM. So obviously, stress triggers VEM factors were and remain more significant in the first its foci, as currently VEM "returned" in these stable foci, having gone from more affluent areas of Central Yakutia.

Aim: To evaluate the influence of living conditions and diet of the indigenous population in the VEM foci on the dynamics of the epidemic process of Viliuisk encephalomyelitis.

MATERIALS AND METHODS

We have studied the materials of our expeditionary epidemiological studies, describing the factors that have potential influence on changes in the dynamics of the epidemiological process and clinical polymorphism of VEM. Data from the first and further expeditions from the 1950s., (387 patients in whom the disease began between 1951 and 2003) were compared with the most recent.

In recent expeditions (November 2006 and February 2007) collected a variety of epidemiological data among indigenous rural population of the Viliuisk and Nyurba districts of the Sakha Republic (Yakutia). Sampling for epidemiological data amounted to 138 people. Three groups of observations were allocated: VEM patients; persons with prolonged contact with patients; a control group of people living in the same localities, but does not have a close contact with VEM patients.

Out of more than 1000 examined patients with suspected VEM, 387 the above cases that meet the diagnostic criteria for reliable VEM [6] were included in this study. A retrospective evaluation of the clinical and epidemiological materials patients have done. Motor function is further examined on a scale of Lindmark [10] in 50 patients with chronic VEM.Social conditions were assessed by questionnaire.

Patients with reliable VEM were identified in 109 of 295 villages in 9 districts (uluses). The ratio of men to women was 42%: 58%. Accordingly, the age of onset of the disease ranged from 11 to 68 years, with an average of 35.0 years; 338 patients (87,0%) died.

A statistical analysis was performed using SPSS 16.0 software. Comparison of the frequency in groups of patients was performed using the Pearson's chi-square test. The values of $p<0.05$ were considered statistically significant.

RESULTS AND DISCUSSION

In expeditionary studies we have evaluated the migration activity in the period of life of generations considered. Draws attention to the high rate of rural population, stable lives in the same district (87.7%).Low migration activity may contribute to prolonged contact of the inhabitants of the affected villages, including patients with VEM.

But as noted by E. N. Fedorova[9] among the population in 1926 was dominated by those born in rural areas (95.8 per cent). Among births in the village, the proportion of local residents (77.0%) exceeded the proportion of local urban residents are almost twice. In the second half of the 20th century (1989) in the population was

dominated by those born in the cities of 57.5%. Thus, the data indicate a significant decline in the share of rural population of Yakutia in the second half of the 20th century, which is reflected in the manifestations of the epidemic process of VEM.

Dynamics of the incidence of the event demonstrates the change in the ratio of its clinical forms. This ratio was evaluated on the basis of registration within the isolated interval of time because of chronic patients accumulate in the population, creating the impression that chronic VEM significantly prevail over other forms. In accordance with the published data acute and subacute forms of the disease were the majority during the early registration periods in the 1950s. In the 1960s and 1970s there were many acute/subacute cases, but more people moved into the chronic phase. So, 1970-1979, there were 119 patients with reliable VEM, 58 of them had acute or subacute VEM (49%), 31 had acute onset of disease with subsequent development of chronic (26%) and 30 were initially developed chronic VEM (25%). Among those who fell ill in the 1980-ies, acute/subacute VEM was observed in 7%, while in 43% of patients developed a chronic course and the proportion of primary chronic cases increased to 50%, significantly exceeding the figure for 1970-ies ($P < 0.01$) [3].

The impact of the favorable factors found mostly in villages close to the regional centers and Federal highways, compared to distant villages having population more than half of the VEM patients.

To negative factors should be ranked as low employment of residents. Only 69 % of the working population is employed in the national economy. In the villages on average 39% of the families belong to the poor.

A retrospective view in the not so distant Yakutia past allows you to come to an understanding of the many risk factors that influenced the spread of various diseases in the aboriginal population of Yakutia. And although Soviet medicine has made tremendous strides in the improvement of the population of the Republic, malicious echoes of the past can be found in unsolved and severe progressive diseases of the nervous system of our contemporaries. Evidence of such reasoning we can see in the same report the epidemiological unit [5]: "*In a regular household survey of the population, as with the challenges, and, simultaneously, epidemiological detachment was discovered in the Viliuisk district the 25-ve different infectious and parasitic diseases"* And further: *"Undoubtedly, living and social conditions of life of the Yakuts, particularly related to housing and food, contribute significantly to the subsidence of the listed infections and expansive development of all kinds of epidemics".*

We got in the population surveyin the 2006-2007, the conclusion that the group of VEM patients provides itself their own food to a lesser extent compared with the other two groups of contact and control. The same conclusion, about the worst situation in developing their own agriculture, and relates to the breeding of livestock (cows and horses) and to the presence of greenhouse agriculture (table 1). However, this single slice can only indicate the difficulties faced by VEMpatients, doing household chores. The members of their family largely engaged in the care of thesepatients.

Table 1: Own agriculture

Figure	VEM patients	Contact	Control	In all
Not bred livestock	5/26,3	10/14,7	6/15,4	21/15,2
The presence ofgreenhouse	10/52,6*	54/79,4*	35/89,7*	99/78,6

Note: The numerator is the number of observations, the denominator %

*- p=0,005; Pearson's chi-square test

Identify several logic contradicts the data of the questionnaires on traditional activities (see table 2). It turns out that hunting, fishing and harvesting of hay VEM patients, who almost without exception (94,7% - according to the questionnaire survey) are disabled, are more active compared with other compared populations.

The details of the assessment of VEM patients on the scale of Lindmark (171,2±9,1 VEM in patients severe [n=12], and 350,3±51,3 VEM in patients of mild and moderate severity [n=38]) show that most patients with chronic VEM are in the stage of stabilization. In these cases physical labor plays a certain rolein rehabilitation of patients.

Table 2: Traditionalactivities

Figure	VEM patients	Contacts	Control	In all
Hunting	10/52,6*	18/26,5*	6/15,4*	34/27,0
Fishing	6/31,6	16/23,5	4/10,3	26/20,6
Hay	15/78,9	49/72,1	29/74,4	93/73,8

Note: The numerator is the number of observations, the denominator %.

*- p=0,011; Pearson's chi-square test

The research also to carry out certain parallels between the state of resistance of the population and the nature of power, radically changed in the last 2-3 decades. In the past, the diet of VEM patients were not significantly different from the traditionally accepted norms of power in the foci of the disease in the Viliuisk district, characterised by a lack of flour product, salt, predominant use of monotonous small lake fish [5]. Perhaps low calorie diet was defined by a high proportion of acute cases. Contemporary high calorie diet of the population of Yakutia [1, 7] has reduced the acute cases on the increased cases of primary chronic VEM forms.

The positive impact of improving living conditions for the reduction of morbidity, including reliable VEM, at the same time creates the problem of diagnosis of the disease. Encephalopathy status, to which are applied the definition of "organic neurological microsymptoms (ONMS)", "torpid encephalopathy possible and/or probable (questionable) VEM", according to the latest clinical and epidemiological data are becoming more common, whereas the painfulness of the typical VEM forms is significantly reduced.

CONCLUSION

Changing social conditions and diet of the population of Yakutia leads to lower level of acute /subacute VEM cases and to increase the proportion of encephalopathy conditions in the VEM foci, at the same time creates the problem of diagnosis of the disease.

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Evaluation of Actual Nutrition, Quality and Safety of Food Raw Materials and Food Products in the Republic Sakha (Yakutia)

ABSTRACT

The evaluation of actual nutrition of the population in various medical and economic areas of the republic (industrial, agricultural, Arctic) by frequency analysis of food consumption, in accordance with a standardized questionnaire developed by FGBNU «Nutrition Research Institute» employees and the State Research Center for Preventive Medicine, Ministry of Health of the Russian Federation and supplemented by the Nutrition Center of Research Health Institute NEFU named after M.K. Ammosov is carried out. The analysis of compliance of the quality control andfood safety in the Republic Sakha (Yakutia), the requirements of the legislation of the Russian Federation, legislation of the Customs Union is made. The parameters of the consumption of certain food groups by people living in a variety of medical and economic areas of the Republic, including products of local food staples and national dishes are established. Also the researchers identified problems, causes of biosafety of food in the Republic.

Keywords: actual nutrition, frequency method of studying, food, local food raw materials, the national dish, the doctrine of the food security of the Russian Federation, monitoring, supervision, quality food production and food safety, sanitary-chemical, microbiological, parasitological parameters.

INTRODUCTION

The actual nutrition of the population depends on many factors, among which are the main, it is the socio-economic, climatic and geographic conditions of residence and national-cultural. At present, social and economic reforms in the Republic of Sakha (Yakutia) are associated with the exacerbation of many negative phenomena, including poor maintenance of various groups of the population balanced diet according to physiological norms, reducing the quality and safety of food products, provoke the development of disease and reduced quality of life population. Given the characteristics of the region of residence, the country has a difficult situation with food security quality and safety of food, especially in remote areas. This is largely due to the high proportion of transport costs and complex multistep commercial security system, which significantly increases the cost of food and essential commodities related to the population of the republic as a whole.

The staff of the Center for Food Research Institute of Health NEFU named M.K. Ammosov monitoring the actual power of the adult population of the republic by the daily food recall revealed an unsatisfactory response power dynamics for 10 years (2001-2012). The parameters inadequate intake certain food groups such as dairy, dairy, meat and fish products, and excessive consumption of bakery, confectionery, sugar and sweets. [4]

In the study of food energy value and chemical composition of rations in accordance with the approved rules of physiological consumption, low levels of most necessary nutrient reserves are revealed [3]. The greatest contribution of simple carbohydrates and saturated fats are found in the dietary energy. In assessing the availability of individual rations macronutrient and micronutrient deficiency we revealed combined deficiency of nutrients,

including essential vitamins and minerals. The close connection with different malnutrition deficiency states, anemia, osteopenia, pathology of pregnancy, childbirth and fetal overweight and obesity is found [5].

The Republic of Sakha (Yakutia) is the largest region of the Russian Federation with a population of less than one million people, therefore referring to one of the lowest population density in Russia (with Chukotsky and Nenets Autonomous Districts). Yakutia is a region with high levels of natural resource economic potential. The republic has a complicated transportation scheme, the region's infrastructure is underdeveloped in many remote areas, with the exception of only large industrial and administrative centers. Today, the function of state control and supervision over the quality and food safety, and prevention of infectious, mass non-infectious and occupational diseases in the country assigned to the Department of Federal Service in the field of Consumer Protection and Human Welfare in the Republic of Sakha (Yakutia).

The lack of positive trends in morbidity and mortality from chronic diseases, the development of which is largely due to the nutritional factor, determines the goals and objectives of our study.

The aim is a comprehensive assessment of actual nutrition by frequency of certain food consumption, quality and safety of food raw materials and food products in the Republic of Sakha (Yakutia).

MATERIALS OF THE RESEARCH

The assessment of actual nutrition by frequency of food consumption was carried out in a group of 51 products, including 12 national dishes. The study involved adults aged 18 to 75 years old living in the three medical and economic areas of the republic (agricultural, industrial, and Arctic). The sample consisted of 2118 people [4].

Analysis of the quality and safety of food raw materials and food products was carried out using indicators of the industry's annual statistical reporting form №18 «Data on the health status of a subject of the Russian Federation" for 2007-2014 years, State reports "On the state sanitary and epidemiological welfare of the population in the Russian Federation in 2013 "state Report" On the state sanitary and epidemiological welfare of the population in the Republic of Sakha (Yakutia) for 2001-2014 years ".

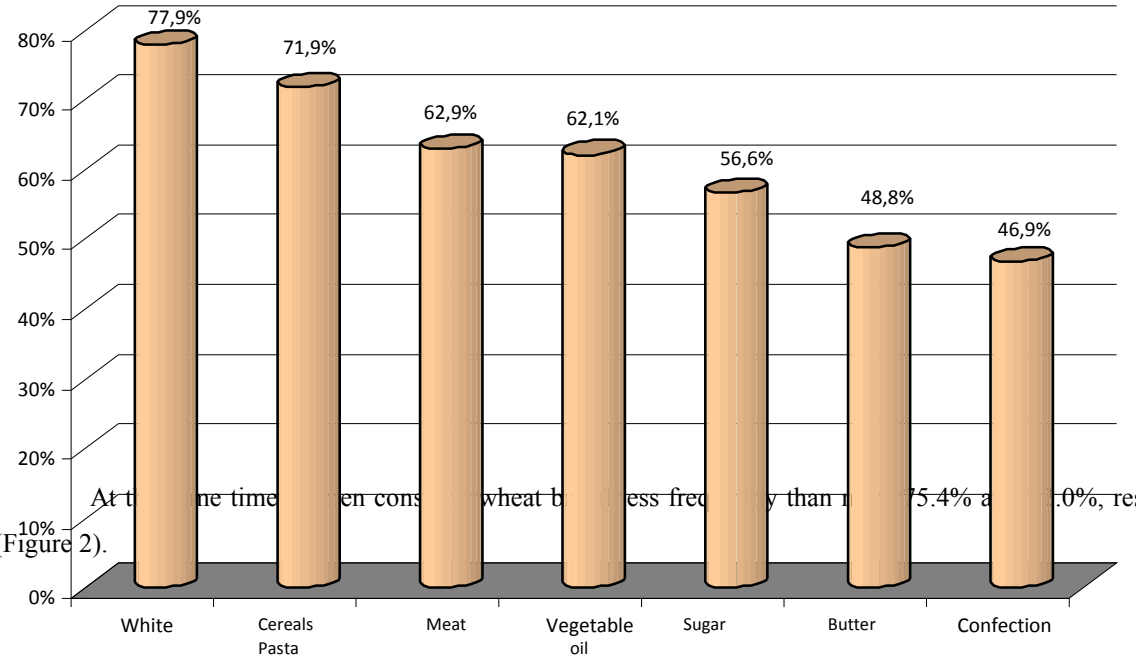
RESULTS

The evaluation of food consumption by a frequency questionnaire method included the following questions: Do you often eat some food "every day", "once a week", "1-2 times a week" and "rarely or never".

In general, the consumption of certain food, prevailing in the diet showed the following parameters in% of the total number examined presented in Figure 1.

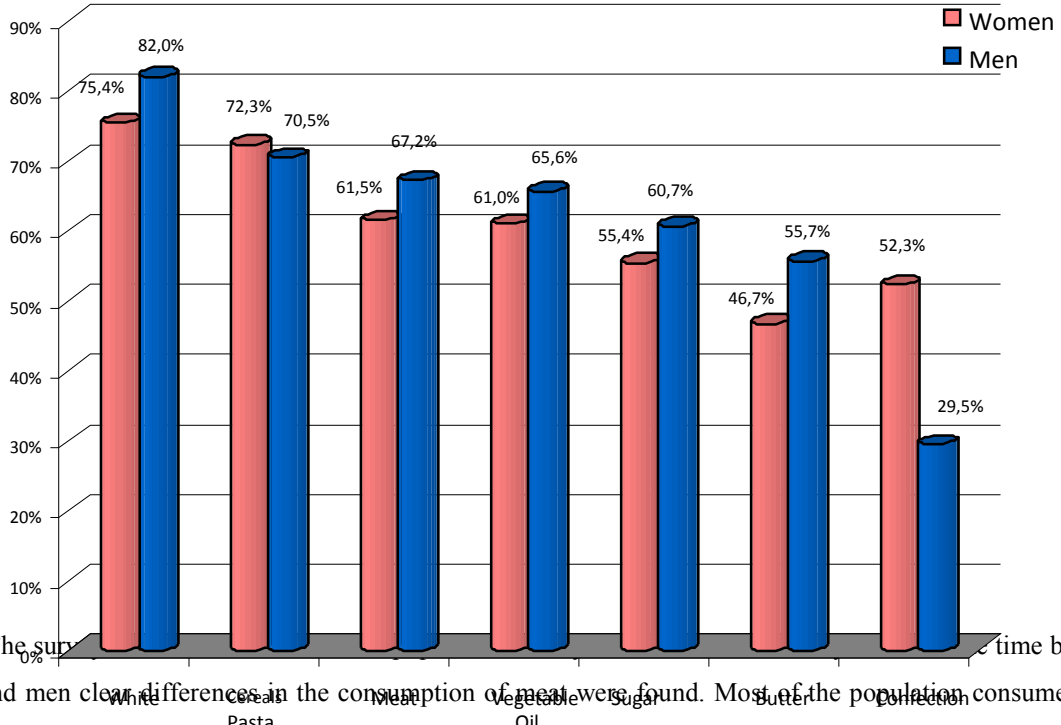
Fig. 1 Basic food groups prevailing in "daily" diet surveyed

"



At t ne time en cons wheat b ess fre y than r 75.4% a .0%, respectively (Figure 2).

Fig. 2 The frequency of certain food consumption among women and men



The sury e time between women and men clear differences in the consumption of meat were found. Most of the population consumes beef, compared with other types of meat. Also, clear differences in the consumption of staple foods in the daily diet of women and men have been identified (Figure 2).

With regard to the consumption of fish and fish products we found the following parameters as of the total number surveyed only 18.0% of men and women consume fish "every day", despite the fact that men consume fish more often than women, 24.6% and 15.9% respectively. Liver is a valuable source of organic iron and protein necessary for blood formation and in general for the normal functioning of the human body. However, during the

week it is included in the diet only at 29% and 30.5% of the population, depending on the health and economic zone of residence, including daily use of 1.7%, several times a week - 6.2% and 1-2 twice a week - 21.3% of the surveyed population. From sausage cooked sausage daily use - 8.6% and smoked sausages - 4.3%, respectively. At the same time, men consume sausage more often than women, 24.0% and 44.7% respectively. Milk and dairy products (whole milk and milk products, cheese, cottage cheese) have a number of very valuable nutritional properties that can not be replaced by other products. Milk is consumed daily only by 11.3% of respondents. It should be noted more half of the respondents 62.5% consume dairy products (yogurt, butter milk) and prefer consumption of local products. It was revealed that 58.5% of women 34,7% of men consume cottage cheese and sour cream are rarely or not at all to eat. Such foods as potatoes and fresh vegetables, herbs consume "several times a week '43.1% and 39.1% of the male and female population respectively. Fresh fruits in your diet includes 1-2 times a week, 36.7% of respondents. With regard to the consumption of dried fruits, nuts, found that these types of products are used "rarely or never" 77.4% women and 70.2% men respectively. According to the recommendations on nutrition, the basis of a healthy diet is the regular consumption of a variety of cereals. According to information received daily rump consumes 71.9% of respondents, while men consume the product more often than women, 56.1% and 33.6%, respectively.

The study found that 48.8% of the surveyed population consume butter "daily", while between women and men clear differences in the consumption of these products have been identified.

With respect to such food as vegetable oil, an indispensable source of vitamin E and polyunsaturated fatty acids, the proportion of people consuming the product 3-6 times a week amounted 62.1%. Thus, often consume oil men than women, 65.0% and 36.8% respectively.

The study showed that overall 56.6% of the respondents consume sugar "on a daily basis." The proportion of people who use sugar "rarely or never", is 30.5%, with women more likely to consume sugar, than men, 86.2% and 68.0%, respectively.

Table 1 - Frequency of certain food consumption among the population of Arctic, agricultural and industrial areas of the Republic of Sakha (Yakutia)

The study population was studied consumption of beverages such as tea, cocoa drink coffee cereals, carbonated beverages and fruit and vegetable juices, vitamin drinks.

The majority, 93.8% of respondents drink tea "every day", no sex-related differences in the consumption of tea are revealed. 23.8% of respondents answered that they consume cereal drink coffee "every day" and 76.2% said that they never drink coffee. At the same time men consume coffee more frequently than women, 55.3% and 38.4% respectively. With regard to the consumption of carbonated drinks, more than half of the surveyed population, 86.3% prefer to drink these beverages. Fruit and vegetable juices and vitamin drinks are daily consumed by 15.2% of respondents, while 29.3% drink rarely.

We would like to highlight the frequency of food consumption of local raw food or national dishes, which can be divided into 3 groups of products: meat (elk meat, venison, hare, black pudding, giblets; lactic fermented milk products (kuercheh, suorat, byyppah, mare's milk), flour (pancakes, waffles, salamat). The food consumption frequency is very low, only 40.2% of respondents said that pancakes are consumed 1-2 times a week.

The main criteria that characterize the quality and safety of food raw materials and food, is it potentially dangerous contamination by toxic and microbiological agents. The monitoring of food raw materials and food products, indicates that, over the past two decades (18 years), the proportion of production that does not meet quality standards for microbiological indicators ranges from 12-11% [2]. The Republic of Sakha (Yakutia) refers to the

subjects of the Russian Federation, with the great number of testing food raw materials and food products, exceeding hygienic standards for microbiological indicators [1]. In 2014 the figure was 9.5%, which exceeds the average 2-fold (RF in 2013- 4.6%) [1,3]. Nevertheless, the republic continues the downward trend of testing not requiring hygienic standards for microbiological indicators as compared in 1997- 11.7%, in 2000- 12.5%, 14.7% in 2005, in 2007 - 12.9%, 12.1% in 2010, in 2012- 11.8%. It should be noted that the aggregate share of imported products that do not meet the requirements in terms of microbial contamination leveled from 7.2% to 2.1% (3.4 times). [2].

According to the parameters of chemical safety in the republic a tendency to low specific gravity of food product samples was established that do not meet the requirements of sanitary legislation, from 5.8% in 1997 to 0.5% in 2014. [2]. In 2014, the proportion of samples of food raw materials and food products that exceed hygienic standards on the content of chemical contaminants was 0.5%, which is at the national average (the Russian Federation in 2013- 0.6%) [1,4]. At the same time, the proportion of samples of imported products do not comply with sanitary and epidemiological requirements for this indicator on average ranges from 4 to 2% [2, 5].

Ensuring the safety of food for parasitological indicators remains relevant in the country. According to the accounting data for the past 8 years, there is a decrease the proportion of samples of food raw materials and food products that do not meet sanitary and epidemiological requirements for parasitological indices by 0.5% (from 1.6% in 2007 to 1.1% in 2014). In 2014 the number of samples studied by parasitological parameters exceeds the number of samples in 2013 1.6 times (2014- 1248, 2013.- 770). According to the research, the proportion of samples that do not meet hygienic standards is 1.1% (in 2013 - 1.7%), which exceeds the figure in Russia is 1.8 times (RF in 2013.- 0.6%) [1,4]. The largest share of non-standard set of samples in a group of food products "fish and non-fish species and products produced from them" - 10 of the 308 samples (3.2%) did not comply with standards. [4]

When considering meaningful review issues of quality and safety of food raw materials and food products, it should be noted that the most critical indicators of the sample proportion of products not meeting the requirements for microbiological parameters in the basic food groups are as follows: "milk and dairy products", "meat and meat products "," bird and poultry products "," fish and fish products "," bakery "," vegetables, herbs dining room". However, the dynamics of the past 10 years shows a steady downward trend in the sample proportion of products not meeting the requirements of the following categories: "Milk and dairy products" - in 2.1 times (2000- 20.2%, in 2014 - 9,5%); "Meat and meat products" - 1.7 times (11.6% in 2000, in 2014g.- 6.5%), "bakery" - in 1.5 times (2000- 10.5% , 2014- to 6.7%) (Table 2) [2,4].

Table 2 – The sample proportion of food raw materials and food products that do not meet hygienic standards for microbiological parameters

Significant improvement in product quality can not be achieved because of unfavorable sanitary condition of facilities, lack of centralized water supply, sanitation, lack of water treatment systems. The state policy in the field of equipment of enterprises, agricultural cooperatives, modern technological equipment, as well as the allocation of funds for the reconstruction of facilities makes a significant contribution to solving the problems of providing the population with food products of assured quality. However, the weakening of intra-industrial inspection at manufacturing enterprises, improving food quality indicators is not possible. In addition, the notorious that workers and food processing businesses are "decreed contingent" in general, the quality of products depends on the health status and the general level of professional training.

Control over the safety of food raw materials and foodstuffs from genetically modified sources is conducted in the framework of the Resolution of the Chief State Sanitary Doctor of the Russian Federation from 31

December, 2004. N 13 "On strengthening the supervision of food derived from GMO". Since 2008 on the basis of the virology laboratory conducted research on the identification of genetically modified sources. In 2014. studied 138 samples of meat, milk, flour, cereal, fruit and vegetable products, canned food, cereals, the content of genetically modified sources above the permissible requirements were found (in 2013y.- 77 samples, 80 samples 2012y., in 2011y. - 133 samples) the presence of GMOs in the period 2008-2014 not established [2,6].

CONCLUSION

The evaluation of dietary intake using the frequency method of studying food consumption has revealed insufficient intake of useful basic foodstuff such as milk, fish, meat products, on average, the proportion of daily consumption of such food is between 11.3% and milk dairy products to 37.1% of fish products or 1-2 times a week. Depending on a place of residence, the frequency of food consumption changes as well. In the Arctic zone the population generally rarely sees milk and dairy products, vegetables, fruits and herbs, however their local products are common, 6.3% - 62.9% and fish - venison respectively. Meanwhile, the population of the Arctic zone consume higher consumption of sugar and confectionery products, 56.6% and 35.5%, respectively. At the same time, women are more likely to consume sugar-containing products than men, 86.2% and 68%, respectively.

The above results suggest a certain degree of possible deficiency or excess of nutrients, vitamins, minerals, originating from food for functioning. For example, rare or insufficient consumption of meat and meat products gives grounds to make an assumption about the insufficient consumption of protein (essential amino acids), unsaturated fatty acids, the iron in the diet, causing the body's protein-energy malnutrition, iron deficiency and anemia and other disorders. Insufficient frequency of consumption of milk and dairy products, fish and fishery products allows you to think about possible shortage of calcium and phosphorus for proper bone mineralization and osteoporosis, fermented milk products - about lack of lactic acid bacteria, contributing to the development of normal microflora.

According to the monitoring of the state of food raw materials and food products, carried out by the Office of Rospotrebnadzor for the Republic of Sakha (Yakutia), over the past two decades (18 years), the proportion of production not meeting quality standards for microbiological indicators has ranged from 12-11%. In 2014 figure was 9.5%, which exceeded the average 2-fold (RF in 2013 - 4.6%).

The republic has established the downward trend of low specific gravity of testing food products that do not meet the requirements of sanitary legislation, from 5.8% in 1997 to 0.5% in 2014. In 2014, the proportion of food raw materials and food products that exceed hygienic standards on the content of chemical contaminants was 0.5%, which is at the national average (the Russian Federation in 2013 - 0.6%).

In the dynamics of the last 10 years in the major food groups: "milk and dairy products", "meat and meat products", "poultry and poultry products", "fish and fish products", "bakery", "vegetables and dining greens" retained the largest share of product samples not meeting the requirements for microbiological parameters.

Control over the safety of food raw materials and foodstuffs from genetically modified sources is carried out since 2008, the presence of GMOs in the period 2008-2014 not installed.

Thus, conducting such monitoring studies assessing the actual nutrition to study the frequency of consumption of specific products and analysis of the quality and safety of food raw materials and food products will enable a comprehensive approach to solving the problem of epidemiological and sanitary-hygienic state power and find ways to optimize the structure of nutrition and prevention alimentary- related diseases in the Republic of Sakha (Yakutia).

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Nutrition and Lifestyle of Indigenous Rural Population of Yakutia

ABSTRACT

On sample of indigenous rural population research of a nutrition, physical activity, and monthly level of the income, the social status and anthropometrical indexes is carried out. At a significant proportion of the surveyed population against an unbalanced nutrition and insufficient physical activity signs of the metabolic disorders bound to the raised mass of a body are observed. High degree of prevalence of overweight and obesity, probably, is a consequence of a misbalance between energy consumption and energy costs.

Keywords: indigenous population, lifestyle, nutrition, physical activity, metabolic disorders, overweight, obesity.

INTRODUCTION

The prevalence of overweight and obesity over the past decade has increased significantly. Among Russians, the proportion of working-age people who are overweight is 25-30%, but with varying degrees of obesity - 15-25%. (Antsiferov, 2007), (Grandfathers, 2006). Obesity is the result of an excessive accumulation of adipose tissue in the body and the associated violations of the functional activity of adipocytes. Adipocytes produce 30 hormonal factors involved in the regulation of metabolism and energy (Santa 2004). Obesity is also related to risk factors such social diseases as hypertension, coronary heart disease and type 2 diabetes. The main reasons leading to obesity are excessive amounts of high calorie foods and combined with a reduction in energy costs, in particular physical activity. The prevalence of obesity will vary in different populations, depending on the ethnic and socio-economic factors (Gurov, 2010). In this connection it is necessary to examine the prevalence of overweight and obesity in specific regions and population groups. It should be noted that the prevalence of overweight - state before obesity poorly understood (Antsiferov, 2007). The purpose of this work is to determine the nature of the nutrition and lifestyle of the indigenous rural population to improve methods of prevention of obesity and metabolic disorders.

MATERIALS AND METHODS

In 2013-2014 within the framework of international cooperation programs Research Institute of Health NEFU and Northwestern University, USA, conducted a joint field work to study lifestyle, nutrition, metabolic status of the indigenous population of Yakutia. During the surveyed representatives of 210 adults (151 female and 59 males aged 20 years and older). Of those in the age group 20-39 years - 40 people, aged 40-59 - 103, aged 60 and over – 67. The average age of those surveyed was 52 years. The study protocol was approved by the local Committee for Biomedical Ethics at the Yakut Scientific Center of complex medical problems, SB RAMS (Protocol №16 of 16.04.2009). The study was conducted under the condition of voluntary informed consent of participants by trained personnel. The examination program included a survey of a questionnaire on socio-demographic characteristics of respondents voltage (and frequency of consumption of certain foods), physical activity, participation in traditional activities, doubling the measurement of blood pressure, anthropometric and biochemical research. Measuring height (body length) was performed using a standing stadiometer to the nearest 0.1 cm. The body weight (up to 100 g), and body composition (fat percentage and weight, fat-free mass, muscle mass and bone)

was determined using bioimpedance analyzer "Tanita SSC 330" (Japan). Skinfold thickness was measured by calipers by a standard technique. Body mass index was calculated as the ratio of the body weight (kg) by height (m^2). When assessing the body mass index using WHO criteria (WHO, 2000). Waist circumference was measured in a standing position in the middle of the distance from the bottom edge of the costal arch to the iliac crest, with an accuracy of 0.1 cm. Hip circumference measured in a standing position at the level of the greater trochanter. The work was conducted in the framework of the base part of the public task of the Ministry of Education and Science of the Russian Federation №3052 «Adaptive capacity, values and settings to preserve the health of the indigenous population of Yakutia" (state registration number 01201460280).

Statistical analysis was carried out in an environment of the application package IBM SPSS Statistics version 22. Assessment conjugation qualitative characteristics were performed by using chi-square test of Pearson (χ^2) with a threshold level of significance 0.05.

RESULTS AND DISCUSSION.

Results of the participants social status study showed that the proportion of families was 66%, unmarried - 16%, widowed - 12%, and divorced - 6%. The average number of family members was 4 persons. The average household income of respondents was at the level of 44 thousand rubles per month, and the individual - 23 ths. rub. The monthly incomes of the majority of respondents (84%) were equal to the minimum subsistence level or exceed it. The main source of income for 31.4% of the population surveyed is wages, and 41.4% - wages plus pension. Health status was assessed by 63% of respondents as "average" and as "good" - 23%. According to a questionnaire survey of 50% of the surveyed population had high blood pressure, 21% - fasting hyperglycemia, 9% - type 2 diabetes.

Results of the analysis of sources of food have shown that the needs of the township 80% met through purchases in the store (Table 1). The share of production of domestic origin in the nutrition of the population surveyed an average of 18%. Help families to provide food and occupy a small share of total needs. The demand for meat and dairy products only 11-27% was met by farms. The sources of vegetables and berries were basically home vegetable garden and harvesting of wild berries.

Table 1

Results of the study diet showed that the majority of respondents most frequently consumed baked products, animal fats and meat (Fig.). From vegetables every day half of the respondents used the onions. The most popular drink is tea. Every third respondent consumed sweets daily. Least Eat foods are fruits, berries, eggs and fish.

Fig. The percentage of respondents who use daily individual food

Physical activity of the Berdigestjah population mainly formed from an agricultural labor, gardening and livestock care, collecting wild berries, hunting and fishing. These activities are seasonal in nature with the exception of animal care. Picking berries is engaged 82% of the population, backyard gardening - 77%, hay - 33%, animal care - 17%, and hunting and fishing - 29%. The duration of the seasonal physical activity an average of 7 to 15 days at year, except for backyard gardening. Daily physical activity of the working population is low. Most of the persons interviewed during the working day in the main sitting. The population of working hours in a sitting position holds 4 hours, while after hours on foot walking accounts for only about 1 hour. Only 35% of respondents during the

working day primarily go and carry little weight, are engaged in heavy physical labor 8%. Thus, only 43% of the working population is showing a significant physical activity during the workday. Physical exercise are not engaged or involved in very rare 38% of respondents, of which 15% limit physical activity for medical reasons. Daily physical work for 20-30 minutes until slightly sweating engaged only 15% of those surveyed, while 1 per week - 12%. Lack of physical activity can be one of the causes of diseases of the cardiovascular system and metabolic disorders, and energy (Wilson, 2015), (Wilson, 2014).

The results of anthropometric measurements showed that overweight and obesity are found in 50.4% of the surveyed population. Including obesity 2 and 3 degrees occurs in 4%, obesity of 1 degree - 13.6%, overweight - at 32.8% of the population. This male normal weight is recorded more frequently than women - 63.2% and 39.0%, respectively ($\chi 2$ = 12,2, p = 0,032). Gradations in body weight are presented in accordance with WHO recommendations based on the values of body mass index. The high degree of prevalence of overweight and obesity among the indigenous population was observed by us earlier (Klimov et al., 2012). Average anthropometric indices surveyed population, mainly dependent on gender (Table. 2). For women, characterized by a large fat mass, skin fold thickness at all points of measurement exceeds that of men. The average body mass index of women exceeds the normal value (25 kg/m^2), which indicates that this group of the population is more prone to obesity.

Table 2

The results of evaluation supply frequency method showed that individuals with underweight rarely use these types of meat like pork and young horse meat, beef and consume at least 2-3 times a week, while people with normal body weight consume it, usually on a daily basis. In the diet of people with overweight and obesity 1 degree (about 60-85%) dominated animal fats - cream, whipped cream and sour cream, which they use on average at least 1-3 times a week. This butter is included in the daily diet of the majority of the surveyed population (about 60-64%). It should also be noted that the majority of people with normal body weight (55-62%) on a daily basis to eat vegetables (cucumbers and tomatoes), while people with different degrees of obesity (87-90%) use them less often 1-3 times in Week. People who are overweight are also relatively more likely to use the berries: red and black currants, blueberries. It should be noted that, traditionally, the berries are eaten as a jam or in the form of fresh frozen with sugar, which increases the content of calories.

Results of the study indicate that the indigenous population is modern lifestyle with income to meet nutritional needs. These traditional economic activities associated with significant physical exertion, in most cases, are seasonal and do not last for an average of more than 2 weeks in a year. Sedentary lifestyle is typical for the majority of the respondents, as Daily work activity is not associated with significant physical exertion. It should be noted that part of the population that wants to contain farmstead livestock, largely feels the need for mechanization of fodder. For example, 61% of breeders indicate the need to purchase tractors and other agricultural machinery ($\chi 2$ = 69,5, p <0,001). The desire to alleviate the physical work in conjunction with the high cost of agricultural equipment and the costs of its contents, presumably to limit the public's ability to conduct a traditional way of life.

CONCLUSION

Thus, the daily diet of the population rather monotonous, the main place is occupied by bakery products, butter, meat and sweets. A small percentage of respondents in the daily diet include dairy products, vegetables, fruits, berries, eggs and fish. Even given the limitations of frequency method on nutrition study, resulting in an incomplete picture, it should be noted the imbalance in the diet of the rural population. Physical activity in daily life

is characterized as insufficient. Evidence of an imbalance between energy consumption and energy costs is increased prevalence of overweight. At the time of the study in a population was marked associated with obesity metabolic disorders. To change the situation, along with the state policy in the field of healthy nutrition and to create conditions for physical training, the population must be motivated to improve the life quality.

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Table 1

Sources of food

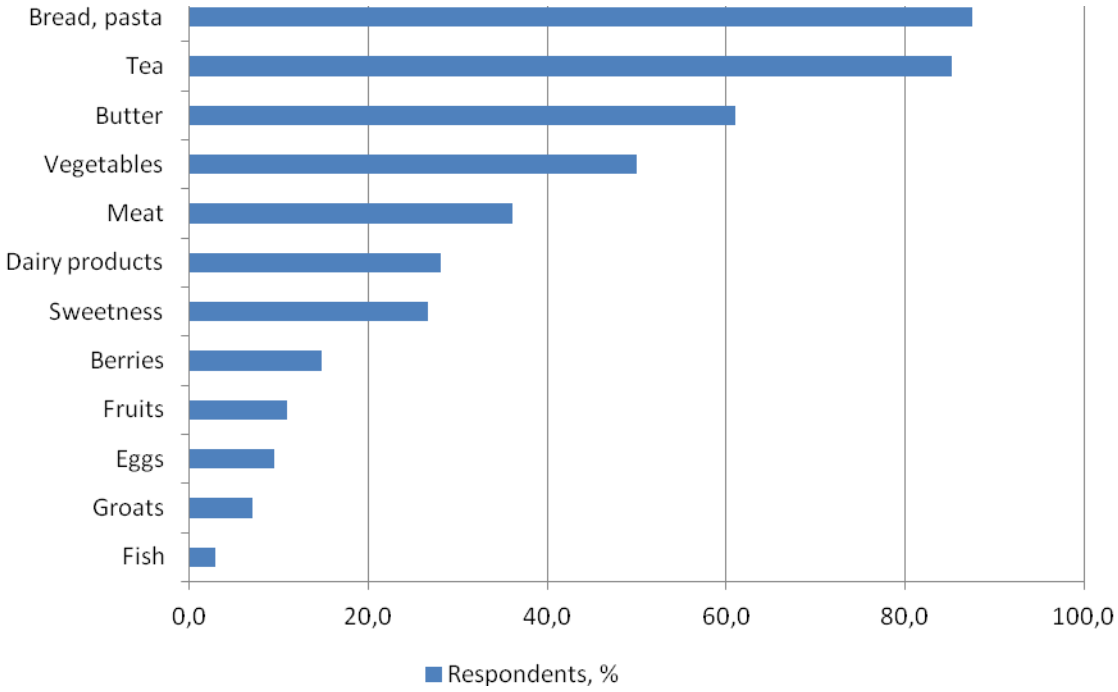
Food items	Store, %	Domestic, %	Exchange, %	Families, %	In total, %
Meat and fish	61,7	26,8	0,2	11,3	100
Dairy products	87,6	10,8	0,2	1,4	100
Fats	91,4	7,5	0,0	1,1	100
bakery products	99,5	0,2	0,0	0,3	100
Groats	100,0	0,0	0,0	0,0	100
Vegetables	51,9	46,4	0,0	1,7	100
Fruits	100,0	0,0	0,0	0,0	100
Berries	16,3	81,1	0,0	2,6	100
Beverages (tea, juices, mineral water)	97,7	2,3	0,0	0,0	100
Sweetness	99,7	0,3	0,0	0,0	100

Table 2

Anthropometric characteristics of the adult population the Berdigestjah village

Anthropometric indices	Women			Men		
	n	M	δ	n	M	δ
Height, cm	150	154,4	5,8	59	164,8	7,1
Body mass, kg	150	62,4	12,1	59	65,4	9,6
Arm circumference, cm	150	30,2	4,2	59	29,7	3,4
Waist circumference, cm	150	94,4	13,2	59	88,1	9,3
Hip circumference, cm	150	97,1	7,4	59	94,9	7,6
Triceps skinfold, mm	150	34,0	9,7	59	17,3	10,0
Biceps skinfold, mm	150	22,8	11,0	59	8,1	4,9
Subscapular skinfold, mm	150	26,5	9,7	59	18,9	8,6
Suprailiac skinfold, mm	150	45,7	12,7	59	32,5	16,4
Sum of skinfold, mm	150	129,0	38,4	59	77,2	34,3
Fat mass, kg	150	21,7	9,3	59	14,7	6,3
Fat mass, %	150	33,5	9,4	59	21,3	6,7
Fat free mass, kg	150	40,9	4,0	59	51,4	5,6
Muscle mass, kg	150	38,8	3,8	59	48,8	5,4
Water mass, kg	150	28,3	3,2	59	36,3	4,0
Water mass, %	150	46,0	5,8	59	55,4	5,1
Bone mass, kg	150	2,1	,2	59	2,6	,3
Body mass index	150	26,3	4,9	59	24,3	3,4

M – average, δ – standard deviation, n – the number of observations



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Clinical Case of Surgical Treatment of Neck and Retrosternal Goiter.

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ABSTRACT

The article presents a clinical case of neck and retrosternal goiter. We describe the clinical features and diagnosis of cervical-retrosternal goiter when intrathoracic goiter location cannot be determined by palpation.

Keywords: retrosternal goiter, thyreoscintigraphy, surgical treatment.

INTRODUCTION

Retrosternal goiter falls below the jugular notch of the sternum. The degree of ptosis can be different, but the upper pole of the crop is generally available to palpation. Retrosternal goiter occurs as a result of thyroptosis, gradual lowering of thyroid gland in the chest.

The main source of retrosternal goiter is low thyroid gland location. Emerging in the lower pole of this gland nodes gradually during growth may be omitted behind the breastbone and collarbone. The resistance of the powerful muscles of the front of the neck (especially in people with a short neck) inhibits the growth of the crop in front, and the movement assembly swallowing its own weight contribute to the growth it toward least resistance towards the mediastinal tissue is extremely pliable.

Retrosternal goiter is not among the rare diseases. The frequency of chest goiters among goiters usual localization varies widely - from 0.2% to 50%, with an average of 3-6%. This diversity is explained by statistics, above all, the lack of a clear definition of "retrosternal goiter," because there is no unanimous opinion, what is the degree of lowering of the thyroid gland should be referred to the retrosternal localization.

According to Petrovsky, approximately 12-20% of all goiters in varying degrees fall behind the breastbone.

According to our data neck and retrosternal goiter found in 12.4% of patients operated on for thyroid cancer, male to female ratio was 1: 11.5 (8% and 92%). Neck goiter is prevalent in the age of 50, while more than half of patients with neck and retrosternal goiter were older than 50 years, which coincides with the majority of domestic and foreign publications. Neck and retrosternal goiter is most common in women over 50 years brachymorphic build, with a relatively short neck and a wide upper thoracic aperture, living in regions of Yakutia, endemic goiter.

The clinical picture depends on the size of the crop and its relation to the surrounding organs. Diagnosis of intrathoracic goiter is very difficult. He usually detected incidentally on chest radiography and diagnosed as a tumor. In the diagnosis of great importance is attached to X-rays and computer and magnetic resonance imaging, contrast studies of the esophagus, tireostsintigrafii.

MATERIALS AND METHODS

Patient M. born in 1944 living in a rural area, addressed to the endocrinologist of the clinical advisory department of the Republican Hospital №1 - National Center for Medicine, HM of Sakha (Yakutia) with complaints of air hunger and body position changes, discomfort sensations in the neck, sweating. The anamnesis showed that

she had been sufferingfrom multinodular goiter for 5 years, in the last year the increase in thyroid cancer was noted. Two years ago she was examined in the endocrinology clinic, after diagnosed as multinodular goiter with subclinical hyperthyroidism. She took thyrosol scheme, since she didn't address to medical care. The patient was not burdened with thyroid disease.

The patient in the ECC underwent thyreoscintigraphy. On thetireoscintigram enlargement of the thyroid gland on the rightlobe was marked. The size of the right lobe is 7.3 x 4.9 cm, the left lobe is 4.1 x 2.2 cm. Location of the thyroid gland is normal. The contours of both lobes are rough, fuzzy. In bothlobes increased accumulation of the radiopharmpreparation as"warm" sites are marked.

The patient was routinely hospitalized in the surgical department N#2 of the Clinical Center RH№1-NCM. While examining in RUC and thehospital №2 the enlarged thyroid gland was estimated by O.A.Nikolaev as a 2nd degree. A few days after admission the patient underwent subtotal resection of the thyroid glandperformed under endotracheal anesthesia. From the operation report of the patient M.: typical Kocher incision on the neck. Divorced straight neck muscles. The thyroid gland is emphasized. During the investigating it was found that the right lobe sharply increased in size 8.0 x 4.0 x 3.0 cm. resulting to the formation of a tumor diameter of 4.5 cm. In whitish capsule adenomatous and colloid nature.Isthmus 4.0 x 4.5 x 1.5 cm. The depth of the cut in the whitish portion is measured 1.5 x 0.7 cm. Because of the bigger size of the tumorof the right lobe the trachea is squeezed to the left, the right lobe extends retrotracheally. The lower pole moves to the retrosternal space (Fig. 1). Both lobestightly adjoin the trachea. The left lobe with dimensions 4.0 x 3.5 x 1.0 cm. contains a calcification of 0.7 cm.

During the operation the rapid biopsy was done. Cytology detectedcolloidal goiter in the left lobe, mixed adenomas on the background of cystic-colloid goiterin the right lobe. When frozen section in the left lobe revealed macrofollicular colloid struma with focal cystic fibrosis in the right macrofollicular colloid struma with focal adenomatosis, fibrosis with lymphoid infiltration.

The final morphological diagnosis: macrofollicular colloid goiter with cystic degeneration, focal fibrosis.

RESULTS

The presented case is interesting because during the preoperative examination on the neck with the help of palpation we determined not only by the upper pole of the right lobe, and "lower" pole of the right lobe above the jugular notch, as acervical narrow portion of its tissue connected the chest part of the thyroid gland with the neck site. This area was so narrow that only many years of experience of the operating surgeon didn't allow to reserve a part of the right lobe of the sternum. Just when thyreoscintigraphy retrosternal site does not accumulate radioactive iodine as a result of pronounced degenerative changes that did not give a full picture of the size of the crop. In this connection the necessity of radiological diagnostic methods, allowing to evaluate objectively the degree of magnification and location of the thyroid gland, as well as the degree of narrowing of the lumen of the trachea.

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Fig. 1 macropreparations right lobe of the thyroid gland isthmus and retrosternal part.

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Diagnostics at Alimentary Prevention of Non-Specific Diseases

ABSTRACT

In order to identify risk factors of nutrition-related diseases using a system Nutritest IP-3 the nutritional status of 3500 patients (mean age 48.4 ± 0.3 years), living in the Moscow region, has been examined. In the analysis of dietary intake on the average increased ration calorie due to excess intake of the total and saturated fat has been shown. Patients were overweight and obese. Osteopenia and osteoporosis were detected. Analysis of the results of biochemical studies revealed in patients increased levels of cholesterol, LDL cholesterol, triglycerides and glucose. These experiments allow developing a system of prevention of noncommunicable diseases, to carry out a personalized alimentary correction of violations of nutritional status taking into account gender and age features.

Keywords: actual nutrition, nutritional status, hypercholesterolemia, hyperglycemia, bone density.

Healthy diet is an essential component of healthy lifestyle and implies the need for food intake and biologically active substances, ensuring optimal implementation of physiological and biochemical processes enshrined in the human genotype [2,4].

Nutritional structural disturbance leads to changes in nutritional status that promotes the development of non-infectious diseases, which account for more than half of mortality causes in our country. It is proved that the contribution of nutrition to the development of cardiovascular diseases, diabetes, osteoporosis, obesity, some forms of malignancy ranges from 30 to 50%.

Currently, as a part of the nutritional prevention and correction of non-infectious diseases in FSBSI "Research Centre of Nutition" to create a consultative and diagnostic center "Healthy Nutrition", whose main task is to provide highly consultative and diagnostic assistance for optimal nutrition.

The aim of the present study was to assess dietary intake, nutritional status and identifying risk factors nutrition-related diseases in patients who were examined, comprising modern genomic and post-genomic approaches analysis, consultative and diagnostic center "Healthy Nutrition".

Materials and methods

On the basis of the "Nutritest SP-3" 3,500 peoplewere surveyed (average age 48,4 ± 0,3 years) living in the Moscow region [1, 3, 5, 6].

Determination of body composition (water content, absolute and relative weight of adipose tissue and muscle) was performed using the bioimpedansmetra «InBody 720" ("MEDASS", Russia).

The study of energy expenditure at rest by indirect calorimetry was performed using a portable metabolografa VO2000 («MedGraphics», USA).

Determining the degree of mineralization of bone tissue to detect the risk of osteoporosis is performed using ultrasound densitometer «Sunlight Omnisense 7000» («BeamMed», Israel) on the basis of studies of 4 areas of the skeleton (radius, tibia, thumb phalanx III, V metatarsal bone).

Biochemical parameters that characterize the state of the lipid, protein, carbohydrate and mineral metabolism were determined using the analyzer c «ABX PENTRA 400» («HORIBA ABX SAS», France), in the automatic mode.

Determination of serum levels of insulin, C-peptide, testosterone, estradiol, thyroid stimulating hormone (TSH), triiodothyronine (T3), thyroxine (T4), parathyroid hormone, homocysteine, vitamin B12 and folic acid was carried out using an automated analyzer immunohemilyuminestsentnogo «Immulite 2000 XPi »(«Siemens Healthcare Diagnostics Inc», USA).

Statistical processing of the results was performed with the use of PASW Statistics 20. Tests for compliance with Hardy-Weinberg equilibrium and the identification of associations by Pearson $\chi 2$ performed using DeFinetti at the Institute of Human Genetics (Munich, Germany).

Results

In the analysis of the actual food in the majority of the surveyed excessive intake of cholesterol, saturated fat was found out. Along with it, 16-80% of the patients had insufficient content in the diet of polyunsaturated fatty acids (PUFAs), omega-3 family, dietary fiber, vitamins A, B1, B2, PP, calcium, and magnesium.

As it can be seen from Table. 1, patients have increased caloric intake due to excess consumption of the total (44.2% in calories) and saturated fat (13.6%). Energy value of the diet was significantly higher in men than women ($p < 0.05$). Along with this, men are significantly more protein consumed in the diet ($p < 0.05$). There was no significant age differences in the chemical composition of the diet of persons of different ages.

Based on the results of the survey we revealed that 30.0% of patients were overweight and 34.1% obese. According bioimpedansmetry 67.0% of patients had an increase in body fat, mainly due to visceral fat, from 21.4% - excess fluid and 34.0% - low skeletal muscle mass.

As it is shown on the Table. 2, women and people with overweight had significantly higher levels of body fat and the visceral fat area, and lower - skeletal muscle mass ($p < 0.001$). The content of total fluid was significantly lower in women than men and significantly higher in individuals with overweight and obesity ($p < 0.001$).

According anthropometry in patients over 30 years showed an increase in body mass index (25.0 + 0.28 kg / m2 and 30.1 + 0.20 kg / m2, $p < 0.001$), waist circumference (70.8 + 1, 36 cm and 80.7 cm + 1.02, $p < 0.001$), the hips (91.1 + 1.36 cm and 96.3 cm + 1.13, $p < 0.01$).

Patients over 60 years old there was a significant decline in the relative value of fat mass (22.2 + 0.70% and + 0.57 31.2%, $p < 0.05$), the visceral fat area (79.3 + 2.52 cm2 and 120.3 + 1.94 cm2, $p < 0.05$), and reduced - the content of total liquid (37.9 + 0.48 kg and 35.5 kg + 0.36, $p < 0.001$), and the mass of skeletal muscle (28.4 + 0.39 kg and 26.4 kg + 0.29, $p < 0.001$). Research resting energy expenditure by indirect calorimetry revealed their significant decrease in patients older age group (1794.2 + 32.4 kcal and 1738.2 kcal + 29.36, $p < 0.05$).

Blood pressure was significantly higher in men and individuals with overweight and obesity ($p < 0.001$). Systolic (114.0 + 0.96 mmHg and 139.5 + 1.41 mmHg, $p < 0.001$) and diastolic blood pressure (74.5 + 0.68 mm Hg and 86.6 + 0.81 mm Hg, $p < 0.001$) was significantly increased in patients older age group.

According to the ultrasonic osteodensitometry osteopenia was found in 31.0% of men and 25.0% women, and osteoporosis - respectively, 20.9% and 30.3%. At the same time women's group average risk of osteoporosis was significantly higher than in men ($p < 0.05$). In patients older than 60 years were revealed a significant decrease in the T-test, which characterizes bone mineral density (-1.14 + 0.08 and 0.09 + -1.23, $p < 0.001$).

Analysis of the results of biochemical studies characterizing the state of nutritional status, revealed the presence of hypercholesterolemia in 68.7% of patients. Reduced levels of HDL cholesterol in the blood serum was

observed in 5.8% of patients, the increased concentration of LDL cholesterol - at 63.9%, triglycerides - at 22.5%, glucose - at 29.4%. In individuals with overweight were found significantly higher levels of total cholesterol ($p < 0.01$) and lower - HDL cholesterol ($p < 0.001$). At the same time in men ($p < 0.01$) and obese ($p < 0.001$) had significantly higher levels of triglycerides and uric acid in the blood serum.

The excess of normal levels of homocysteine in the blood serum was observed in 7.6% of men. The level of homocysteine in men was significantly higher ($p < 0.05$) than in women. At the same time decrease in providing patients with folic acid, involved in the metabolism of homocysteine, it was detected in 12% of patients. The contents of the serum vitamin B12 were within normal range in all groups surveyed.

It had higher cholesterol levels (4.88 ± 0.10 mmol / L and 5.67 ± 0.05 mmol / L, $p < 0.05$) and glucose (5.28 ± 0.07 mmol / l and 6, 16 + 0.08 mmol / L, $p < 0.01$) in the serum of patients older than 30 years and triglyceride levels - over 60 years (1.13 ± 0.11 mmol / l and 1.92 + 0.40 mmol / l, $p < 0.05$). The content of cholesterol and serum glucose associated with body mass index surveyed.

In patients older than 30 years had significantly higher levels of uric acid in the blood serum (274.3 + 7.09 mmol / L and 305.6 + 4.39 mmol / L, $p < 0.001$) and older than 60 years - the concentration of urea (4.76 + 0.12 mmol / l and 7.90 + 1.98 mmol / L, $p < 0.01$).

There was a significant decrease after 60 years of iron levels in the blood serum (16.5 + 0.62 mmol / L and 16.1 ± 0.41 mmol / L, $p < 0.001$) and a significant increase in the calcium concentration (2.45 + 0, 01 mmol / l and 3.14 + 0.60 mmol / l, $p < 0.02$).

The study of vitamin provision revealed a significant decrease in people older than 60 years the level of folic acid in the serum (6.94 + 0.96 ng / ml and 4.98 + 0.62 ng / ml, $p < 0.05$). The content of vitamin B12 and homocysteine in the blood serum with age tended to decrease.

In the analysis of indicators of hormonal status there was a significant reduction in serum levels of triiodothyronine (116.6 + 14.6 ng / dl and 88.8 + 5.60 ng / dl, $p < 0.05$) in patients older than 30 years and testosterone (182.2 + 44.9 ng / dL and 114.8 + 28.4 ng / dl, $p < 0.01$) - in the older age group surveyed.

These experiments allow based on high-tech methods to develop a system of prevention of noncommunicable diseases, to carry out a personalized alimentary correction of violations of nutritional status.

Table 1. Chemical composition and energy content of the diet of patients according to gender and body mass index (M ± m)

Index	Gender	
	Men	women
Energyvalue, kcal	2903,6 ± 17,1	2429,5 ± 5,59*
Protein, g	99,6 ± 5,88	86,0 ± 1,98*
Protein,% bycaloric	13,4 ± 0,37	13,7 ± 0,17
Totalfat, g	136,8 ± 7,36	125,5 ± 3,31
Fat% oncaloric	42,0 ± 1,26	44,6 ± 1,11
NLC% oncaloric	14,0 ± 0,44	13,8 ± 0,16
Totalcarbohydrates	318,5 ± 18,6	238,9 ± 6,10***
Carbohydrates% oncaloric	43,3 ± 1,56	37,3 ± 0,51
Sugaradded,% ofcaloric	10,1 ± 1,03	9,27 ± 0,33

Note here and in Table. 2: * - significant differences ($p < 0.05$), the index of women against men, ** - significant differences ($p < 0.01$) ** * - significant differences ($p < 0.001$).

Table 2. Clinical and metabolic characteristics of patients according to gender and body mass index (M ± m)

Index	Gender	
	Men	women
Age, Mr.	45,4 ± 0,71	49,2 ± 0,33
BMI, kg / m2	28,0 ± 0,26	28,8 ± 0,16
Systolic blood pressure, mm Hg	131,9 ± 1,22	125,7 ± 0,72***
Pulsebeats. min.	72,9 ± 1,65	73,9 ± 1,02
T-score	-0,95 ± 0,09	-1,17 ± 0,05*
Fatmass,%	25,8 ± 0,72	31,4 ± 0,48***
Water, kg	47,7 ± 0,43	35,1 ± 0,15***
Skeletalmusclemass, kg	36,3 ± 0,35	26,0 ± 0,14***
The area of the visceral fat,%	104,1 ± 2,85	114,5 ± 2,08***
Energycostsalonekcal	2122,4 ± 45,7	1719,2 ± 14,3***
Totalcholesterol, mmol / l	5,52 ± 0,09	5,67 ± 0,05
HDL Cholesterol, mmol / l	1,35 ± 0,05	1,52 ± 0,01***
LDL Cholesterol, mmol / L	3,30 ± 0,10	3,34 ± 0,05
Triglycerides, mmol / l	2,08 ± 0,42	1,46 ± 0,03**
Glucosemol / l	5,85 ± 0,10	6,01 ± 0,07
Totalprotein, mol / l	75,3 ± 0,72	74,2 ± 0,39
Creatinine, mmol / l	88,5 ± 3,07	76,3 ± 3,29
Uricacid, mmol / l	337,7 ± 8,83	291,3 ± 3,51***
Urea, mmol / l	7,24 ± 1,84	4,99 ± 0,06*
Calcium, mmol / l	2,50 ± 0,02	2,62 ± 0,15
Ironmmol / l	19,1 ± 0,58	15,9 ± 0,27***
Thyroid-stimulating hormone (TSH) ng / dL	3,97 ± 2,28	2,48 ± 0,26
T4, ng / dL	1,07 ± 0,06	1,01 ± 0,03
T3, ng / dL	95,8 ± 9,38	93,6 ± 5,16
Testosteron, ng / dL	307,0 ± 30,6	94,7 ± 15,7***
Estrogenpg / ml	34,7 ± 4,41	85,5 ± 13,4
C-peptide, ng / ml	1,96 ± 0,19	2,08 ± 0,11
Homocysteine, begging / l	11,6 ± 1,15	9,43 ± 0,48*
Folicacid, ng / ml	6,09 ± 0,60	7,03 ± 0,56
Vitamin B12 pg / ml	512,1 ± 71,8	528,7 ± 58,1

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COMORBIDITY IN PATIENTS WITH ACIDITY-RELATED DISEASES AND HYPERTENSION IN THE SAKHA REPUBLIC (YAKUTIA)

ABSTRACT

The aim of the investigation was to study the comorbid status in patients with acidity-related diseases and hypertension.

Materials and Methods.A retrospective analysis of medical records of 63 patients with acidity-related diseases, which were treated in the therapeutic department of the Republican Hospital №1 of Yakutsk, was done.

The study identified comorbid course of acidity-relateddiseases with arterial hypertension, respiratory diseases and urinary system that may be associated with a single mechanism of lesions of various organs and systems.

Keywords:acidity-relateddiseases, chronic gastritis, peptic ulcer disease, gastroesophageal reflux disease, comorbidity.

INTRODUCTION

Acidity-related diseases (ADD) occupy a leading position in the overall incidence of the North. They are prone to chronic relapsing course, affect the most productive age, reduce the quality of life of the population and cause enormous social and economic damage. Acid disorders include such common diseases as chronic gastritis, peptic ulcer, gastroesophageal reflux disease (GERD). GERD is a chronic relapsing disease, the cause of which is a pathological cast of the stomach content into the esophagus. By its frequency, temporary disability and complications is a socio-medical problem in the modern society, including those in the North [3, 5, 6]. Questions of diagnostics, etiology, pathogenesis, clinical symptoms and treatment of these diseases have not lost the sharpness of perception and continue to be relevant.

Nowadays, with the development of diagnostic capabilities of medicine, it is hard to talk about one disease, as in most clinical cases there are comorbidities. Interference of diseases significantly changes clinical symptoms and course of disease, the nature and severity of complications, impairs the quality of life of the patient, retards diagnostic and treatment process. The combination of acidity-relateddiseases and arterial hypertension (AH) is a new state of regulatory system. Their sintony is not accidental, because for both nosologies common etiological and pathological communications are identified. The presence and progression of inflammatory changes in the mucous membrane of the stomach and esophagus in these patients contributes to a specific profile of blood pressure [2, 6].

Objective –to study the comorbid status in patients with acidity-related diseases and hypertension.To identify interference of diseases depending on gender, age, laboratory and instrumental methods of research.

Materials and methods. We randomly analyzed medical records of 63 patients from 20 to 72 years (mean age 58 yrs), 40women and23men, who were hospitalized in therapeutic departmentof the Republican Hospital №1, Yakutsk. In the selected historycasesacidity-relateddiseases and their combination with other somatic diseases, regardless of the reason for hospitalizationwere highlighted. The analysis of medical history, physical examination, laboratory data and instrumental methods has been done.

Results and discussion. According to our data among patients with ARDwomen (67%)dominated.Chronicgastritis (CG) was diagnosed in women in 2 times more often than in men (Table). It is known that the CG is the most common disease of the gastrointestinal tract. This is not only inflammation, which

affects the mucous membrane of the stomach, but the organism overall disease. It is proved that certain clinical and morphological forms of the CG precede or accompany the development of these prognostically unfavorable diseases such as peptic ulcer (PU) and gastric cancer. Thus, the CG is a kind of link between the different diseases, not only of the stomach. The high prevalence of the CG in the Yakutia residents is also associated with Helicobacterpylori infection [1, 4].

Diseases of the digestive system in hospital patients, %

Diagnosis	Female	Male	Total
Gastroesophageal reflux disease	33.3	66.7	9.0
Chronic gastritis	77.7	33.3	54.5
Peptic ulcer disease	80.0	20.0	15.1
Chronic cholecystitis	53.8	46.2	39.9
Cholelithiasis	70.3	29.0	21.2

According to our data, there was a predominance of gastric ulcer in women compared to men; the ratio was 4: 1. Whereasin the men more often duodenal ulcer and in 2 times more common GERDwere diagnosed. Peptic ulcer disease is among the most frequent diseases of the adult population (about 5-10%), and takes on the prevalence the second place after coronary heart disease (CHD) [5].Relying on the results of our research we can indicate comorbid course of chronic gastritis and hypertension - 27% (female- 33%, male -67%), CG and dyscirculatory encephalopathy - 18% (67 and 33% respectively). Comorbidity was noted in patients with chronic gastritis, and respiratory diseases such as chronic bronchitis - 27% (33% female and 67% male), pulmonary fibrosis - 52% (82 and18%), CG and chronic kidney disease - 42% (female - 64, male - 36%). In women comorbid course was for PUD and osteochondrosis- 39%, osteoarthrosis- 24, uterine myoma - 15%. In women, the disease of the stomach and duodenum is often associated with use of the nonsteroidal anti-inflammatory drugs (NSAIDs) to treat the diseases of the musculoskeletal system. Such background diseasesas atherosclerosis, diabetes mellitus (DM) lead to the development of comorbidities. Hyperglycemia and peripheral neuropathy at diabetes lead to the emergence of non-ulcer dyspepsia and GERD. According to our observation, in 6% of patients with diseases of the upper gastrointestinal tract DMwas detected. Comorbidity was in the patients with hepatobiliary disease and hypertension - 24% (female - 75, male - 25%), ischemic heart disease - 15% (80 and 20%), dyscirculatory encephalopathy - 21% (57 and 43%), respectively, in the blood chemistry lipid metabolism, elevated levels of cholesterol, LDL, glucose were revealed. It is known that the metabolism of cholesterol can lead to gallbladder cholesterosis, cholelithiasis, and fatty liver and is a risk factor for atherosclerotic vascular lesions of the heart, brain, hypertension.

Conclusions. The frequency of diseases of the gastrointestinal tract increases with age. Women are more often than men diagnosed with chronic gastritis, duodenitis, chronic cholecystitis, and cholelithiasis. Women often take NSAIDs concerning comorbidities. Comorbid diseases of the digestive system and hypertension, respiratory and urinary tractwere revealed. The presence of common pathogenetic mechanisms of diseases that make up this combination requires a series of investigations. Knowledge of current comorbid diseases is necessary for a doctor, not only in diagnostics, but also to avoid polypharmacy. The use of drugs, affecting a single pathogenic mechanism of diseases, allows achieving a positive effect of treatment with minimal use of drug therapy.

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Features of Metabologram at Patients with Coronary Heart Disease and Obesity

ABSTRACT

Features of metabologram in patients with coronary heart disease and obesity according to indirect calorimetry were studied. It wasrevealed that the respiratory quotient (RQ) was significantly higher in patients with angina and obesity. Elevated levels of RQ can be seen as a predictor of cardiovascular risk and reflect a violation of fat oxidation.

Keywords: coronary heart disease, obesity, respiratory quotient, indirect calorimetry, fat oxidation, energy expenditure at rest.

INTRODUCTION

Cardiovascular disease (CVD) and obesity are actual problems of modern medicine.Coronary heart disease (CHD) is a major cause of morbidity and mortality worldwide [16]. More than 250 cardiovascular risk factors describedin the literature [1, 2], one of which is obesity. Obesity is associated with the development of hypertension, dyslipidemia, type 2 diabetes, and becomes an independent risk factor for CHD at a BMI over 35 kg / m2. [4] It is well known that an imbalance between energy intake and energy expenditure leads to weight gain. However, macronutrient oxidation may also play an important role in the development of obesity and associated diseases.

Metabolic status includes data about resting metabolic rate (RMR) and respiratory quotient (RQ) and could be evaluated with the indirect calorimetry. RQ - the ratio between oxygen consumption and carbon dioxide production reflecting the utilization of the macronutrients in a subject. RQ depends on the ratio of oxidized energy substrates (protein, fat and carbohydrate). The endogenous fat stores oxidation is associated to adecreased RQ, while a high level of RQ reflects the trend of reducing fat oxidation by increasing carbohydrate oxidation. The evaluationofmacronutrientoxidation in patients with CVD and obesity is very important in connection with the results of recent studies. It was found that the reduced fat oxidation associated with a high rate of subsequent weight gain [10], hypertension [8], increased Carotid Intima-Media Thickness [11] and left ventricular concentric remodeling [14].

The aim of this study - to research the features of the metabolic status of patients with coronary heart disease and obesity according to indirect calorimetry.

MATERIALS AND METHODS

The study included 224 patients (89 men and 135 women) with class I-III obesity aged from 34 till80 years. Patients were examinedin the department of cardiovascular disease at the clinic of Institute of nutritionfrom October 2010 to August 2014. Patients were divided into 2 groups. The main group consisted of 112 obese patients with stable angina pectoris (I-IV functional class). The control group also included 112 obese individuals without concomitant angina.Patients in both groups were similar on clinical characteristics and receiving the same pharmacological and dietarytreatment. Pharmacological treatmentincluded angiotensin-converting enzyme inhibitor

or angiotensin receptor II, beta-blockers, calcium antagonists, peripheral prolonged action, aldosterone antagonists, acetylsalicylic acid.

The study excluded patients with clinically significant concomitant diseases(cancer, inflammatory diseases, anemia), endocrine disorders, organic cardiac disease (heart disease, cardiomyopathy), patients with myocardial infarction during the last year, and patients taking drugs that affect metabolic processes. Body composition was measuredby bioelectrical impedance analysis (InBody 520, Korea). The metabolic status assessed by indirect calorimetry («Quark», company COSMED, Italy). Statistical analysis was performed in the program Statistica for Windows 6.1. Data are presented as the mean and standard deviations (M ± SD).Between-group comparisons were analyzed with a Mann-Whitney U test, χ2-test. Relations between variables were sought by correlation analysis (Spearman's r). Statistical significance was set at $p<0,05$.

RESULTS AND DISCUSSION

The patients in both groups were comparableby sex, height and body composition. Thus, the patients had no significant differences in body weight, body mass index, lean and fat body mass, muscle massand total body water(Table 1), but there were differences in age($p = 0,000$). The average age in the group of obese patients with angina pectoris was significantly higher - 59,44±7,9 years than in obese patients without concomitant angina - 51,93±9,4 years. This datacan be explained by the fact that age is an important risk factor for CHD and frequency CHD increases with age.It wasfound that patients in the main group had greater area of the visceral fat (243,8±49,0 cm^2)compared to patients in the control group (229,6 ± 57 cm^2), but these differences were not statistically significant ($p = 0, 06$).

Data of resting metabolic rate and protein oxidation had no significant differences between groups. But RQ was significantly higher in obese patients with angina pectoris: 0,829±0,08 vs. 0,796±0,05 ($p=0,003$). Since RQ reflects the ratio of fat and carbohydrate oxidation, the difference in RQ between the two groups resulted in significant differences in the rate of fat oxidation ($p= 0,000$) and carbohydrateoxidation ($p = 0,073$). Obese patients with angina pectoris had decreasedfat oxidation (96,91±59,0 g/day) and increased carbohydrate oxidation (197,3±150,0 g/day) compared with control patients (124,16±51,0 g/day and 158,8±113 g/day, respectively) ($p<0,05$).Trend continues in the analysis of macronutrients utilization in the percentage of RMR. The groups were comparable by the percentage of protein oxidation (14,89±5,8% against 14,87±3,9%, $p=0,627$), but the percentage of fat oxidation (46,34±25% versus 56,55±18%, $p=0,002$) and carbohydrate oxidation(39,92±27% versus 32,32±20%, $p=0,048$) in the main and control groups were significantly different.

In our study the fat oxidation does not depend on the of the body composition, since the group did not differ in body mass index, as well as the fat and lean body mass. These findings are consistent with studies B.Ukropcova et al [6], which revealed that the differences in the metabolic status does not depend on the percentage of fat mass. They have been suggested that the level of fat oxidation is genetically determined, and not a result of obesity or insulin resistance.

On RQ, and on the fat oxidation can influence energy balance, macronutrient composition of the diet and the availability of substrate oxidation in the blood plasma (glucose, fatty acids) [7]. Fatty acids are available and the main source of energy in the absence of food intake during sleep, that is reflected in lowering RQ awakening. No reduction of RQ after an overnight fast (high fastingRQ) may reflect a violation of some of the mechanisms of fat oxidation [7, 9]. In our study, all patients received comparable dietary treatment. Measurement of the metabolic status conducted under the same conditions in the fasting between the hours of 7:00 am and 8:00 am. Thus, our

findings cannot be attributed to differences in macronutrient composition of the diet and energy balance, andmost likely reveal a violationof fat oxidation in patients with angina pectoris.

The leading role in the development of CVD plays the atherosclerotic process. High RQ in patients with angina pectoris suggests that violationof fat oxidation can play an important role in the pathogenesis of CVD, participating in atherogenesis. This is confirmed by the fact that the increased RQ associated with an increased Carotid Intima-Media Thickness [14], hypertriglyceridemia [12] and other risk factors for CVD [8, 10]. Visceral obesity is also associated with the development of atherosclerosis [2, 3]. In our study, it was found a tendency to increase the level of visceral adipose tissue in patients with angina pectoris (Table 1). Correlation analysis showeddirect correlation between the area of visceral fat and fat oxidation (r=0,193, p =0,018) (Picture 1), which may indicate the effect of a violation of fat oxidation in the distribution of adipose tissue, and thus reflect some mechanisms implementing violations macronutrientoxidation in atherogenesis.

Different forms of CHD including angina pectoris, have a strong influence on the macronutrientoxidation in the myocardium and cardiac function. In a healthy heart β-oxidation of fatty acids is 60-80% of the ATP production [16] and the remaining 20-40% explained by oxidation of carbohydrates (glucose and lactate) and ketone bodies. Unlike normal heart, where the ratio of fat and carbohydrate oxidationis carefully regulated, process of ischemia and reperfusion violate these regulatory mechanisms [13, 16]. As a result, the metabolism of the myocardium at rest is totally dependent on the oxidation of free fatty acids received from the circulation [14].Thus,myocardium becomes more sensitive to any change in the substrate oxidation. It is well known that the overall contribution of myocardial metabolism in RMR of the whole organism less than the contribution of the internal organs such as liver, brain, and skeletal muscle.However, the rate of metabolism of the heart is approximately two times higher than the liver and the brain, and about 30 times greater than that of skeletal muscle [6]. Therefore, considering these facts, reduced fat oxidation according indirect calorimetry may be accompanied by deficiency of substrate oxidation in the myocardium that leads to its subsequent morphological and functional disorders.

Thus, measurement of the metabolic status by indirect calorimetry in patients with angina pectoris and obesity is very important. Data of RMR and RQ can provide the necessary information for the selection of appropriate pharmacological and dietary treatment for each patient according tothe macronutrient oxidation.

CONCLUSION

1. It was found that RQwas significantly higher in obese patients with angina pectoris.

2. Increased levels of respiratory quotient may beconsidered as a predictor of cardiovascular risk and reflect a violation of fat oxidation. High RQ in patients with angina pectoris suggests that the violation of fat oxidationcan play an important role in the pathogenesis of CHD.

3. The data of metabolic status of the patients allows creating a personalized dietary treatment according tothe macronutrient oxidation.

Table 1.Total characteristic of patients (M±SD).

Indices	Control group (112 people)	Treatment group (112 people)	P
Sex (M/F)	48/64	41/71	P=0,339
Height, cm	167,6±10,7	167,9±10,5	P=0,833
Age	51,93±9,4	59,44±7,9	P=0,000
Body mass, kg	123,73±29	125,11±28	P=0,636
IMT, kg/m2	43,82±8	44,17±8	P=0,585
Fatty mass, kg	59,00±18	59,46±16	P=0,612
Lean body mass, кг	64,66±16	65,44±16	P=0,62
Muscle mass, kg	34,69±9	35,11±8,5	P=0,61
General liquid, kg	47,66±12	48,10±12	P=0,643
Visceralfatarea, cm^2	229,6±57	243,8±49	P=0,06

Table 2.Estimationofmetabologramatpatientswithstenocardia and obesity (M±SD).

Indices	Control group (112 people)	Treatment group (112 people)	P
Energy expenditure of rest, kcal / a day	1973±499	1877±482	P=0,145
Oxidationofcarbohydrates, g / a day	158,8±113	197,3±150	P=0,073
Fatoxidation, g / a day	124,16±51	96,91±59	P=0,000
Protein oxidation, g / a day	72±22,5	68±25,7	P=0,264
Respiratory ratio	0,796±0,05	0,829±0,08	P=0,003
% oxidation of carbohydrates	32,32±20	39,92±27	P=0,048
% fat oxidation	56,55±18	46,34±25	P=0,002
% protein oxidation	14,87±3,9	14,89±5,8	P=0,627

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Glucose-Insulin Indicators at Patients with Verified Coronary Atherosclerosis in Yakutia: Ethnicity and Gender Features

The results of glucose-insulin indicators levels study in patients with verified coronary atherosclerosis in comparison with persons without clinical signs of coronary heart disease, depending on ethnic and gender are presented in this article. Among inhabitants of Yakutia coronary atherosclerosis correlated with all studied indicators: since elevated levels of glucose (r=0.344, p<0.01), C-peptide (r=0.713, p<0.01), insulin (r=0.566, p<0.01) and HOMA-IR index (r=0.581, p<0.01). In comparison groups ethnic differences were characterized by higher levels of insulin (p=0.004) and HOMA-IR index (r=0.026) in native women, while in non-native men and women were higher glucose levels (p=0.000). Gender differences were also obtained in comparison groups: insulin and HOMA-IR index levels (p=0.000) in native women, also C-peptide (r=0.004) and insulin (r=0.000) levels in non-native women were higher unlike men.

Keywords: insulin resistance, coronary atherosclerosis, Yakutia.

Introduction

Insulin resistance is an independent risk factor for cardiovascular disease. Hyperinsulinemia is the earliest and a permanent marker of insulin resistance. Insulin resistanceand hyperinsulinemia have both direct and indirect atherogenic effects of blood vessels, contribute to the development of endothelial dysfunction, dyslipidemia, numbers of hormonal, metabolic, procoagulant and inflammatory disorders, activation sympathoadrenal system.

Saturated fatty acids in an excess of from food caused structural changes of cell membranes phospholipids and impaired expression of genes controlling insulin signal transduction in cell, i.e. cause to the development of insulin resistance. Inactivity is decelerating of triglycerides (TG) lipolysis and utilization in muscle and adipose tissues, reduction of glucose transporters translocation in muscles, which leads to the development of insulin resistance[7, 12].

As a result of decrease the sensitivity of target cells to action of insulin is disrupted glucose of insulin-dependent uptake tissues (liver, muscle and adipose tissue) and created the preconditions for development of hyperglycemia. However, due to a compensatory increase ofb-cell pancreatic insulin secretion the glucose concentration in blood serum for a long time canremain of normal. With a powerful lipotropic action the hyperinsulinemia promotes weight gain due to accumulation of adipose tissue mainly in upper body and abdominal cavity (omentum and mesentery).

Hyperinsulinemia also promotes the disruption of blood fibrinolytic activity through the mechanism of synthesis in adipose tissue of plasminogen activation inhibitor, thereby slowing the rate of fibrin cleavage. Insulin resistance is increases of blood platelets adhesion and aggregation, which, according to some authors, is one of the major triggers of hemorheological disorders that contribute to thrombosis and microcirculatory disturbances [1, 3, 4, 9].

Material and methods

This study included results of a survey 939 urban and rural residents of Yakutia aged 45-64 years. The main group included 396 men (189 native, mean age of 54.34 ± 0.44 yr and 207 non-native, mean age 54.76 ± 0.43 yr) and 60 women (28 native, mean age 53.39 ± 1.28 yr and 32non-native, mean age 55.81 ± 1.01 yr) with verified

coronary atherosclerosis according to selective coronary angiography, who referred by the hospital examination in cardiology department of the Republican Hospital No.1-National Medical Center of Yakutsk.

The comparison groups are formed of 212 men (108 native, mean age 51.28 ± 0.57 yr and 104 non-native, mean age 51.09 ± 0.52 yr) and 271 women (145 native, mean age 51.19 ± 0.43 yr and 126 non-native, mean age 51.37 ± 0.47 yr) without clinical signs of coronary heart disease (CHD)to base on results of the complex medical examination during the expedition trips in areas of the Republic of Sakha (Yakutia). The study period: 2007-2010. Yakutians are considered to be representatives of native nationality, non-native nationality – Russians, Ukrainians and Belarusians living in Yakutia constantly.

The survey was conducted according to standard procedures and include the following obligatory sections: standard poll under Rose's questionnaire (for comparison groups) and the questionnaire developed for assess of objective state; triple of arterial pressure measurement using mercury sphygmomanometer to determine the presence and degree of arterial hypertension; electrocardiogram registration in rest; selective coronary angiography (for main groups of patients with CHD); fasting blood glucose, C-peptid and insulin assays. Selective coronary angiography was spent on angiographic installation «Axiom. Artis BA»(Siemens, Germany) according to the standard method of Judkins. As the contrast material used omnipak.

Biochemical parameters were determined by enzymatic method on an automatic analyzer «Cobasmira plus», La Roshe, Switzerland, using commercial kits «Biocon», Germany. For immunoferment analysis used kits «DGR», Germany (determination of insulin) and «Monobind Inc.», USA (determination of C-peptide). The index HOMA-IR was calculated using the formula of D. Matthews et al., 1985: Fasting serum insulin (mU/ml) x fasting plasma glucose (mmol/l) / 22,5. Evaluation of the results of this study was carried out by the conventional classification.

All studies were carried out with the informed consent of the subjects in accordance with ethical standards of Helsinki Declaration (2000) (the protocol of local committee o9n biomedical ethics of YSC CMP No.13 of November 27, 2008).

Statistical analysis of research materials made using the program SPSS (version 13). Used of standard evaluation criteria of statistical hypotheses: Student's t-test, Mann-Whitney test. Data are expressed as M - mean ± m - standard error of mean. To identify the relationship between the studied parameters we used the method of Spearman's correlation analysis. Comparisons were considered statistically significant at $p < 0.05$.

Results and discussion

The mean glucose levels were higher in patients than in persons without CHD (native: Men – 5.39 ± 0.09 vs 4.22 ± 0.05; women – 5.07 ± 0.20 vs 4.49 ± 0.11; non-native: Women – 6.22 ± 0.45 vs 4.92 ± 0.07 mmol/l, p = 0.000, respectively), excluding non-native men(5.50 ± 0.10 vs 5.22 ± 0.07 mmol/l, p = 0.059, respectively). In comparison groups the gender differences were characterized by higher levels of glucose in non-native men, unlike women (5.22 ± 0.07 vs 4.92 ± 0.07 mmol/l, p = 0.009, respectively). The mean glucose level was higher among native women without CHD, living in city compared to rural women (4.89 ± 0.08 vs 4.32 ± 0.14 mmol/l, p = 0.000, respectively). In other groups no significant differences depending on place of residence have been identified (Table 1).

The mean levels of C-peptide, insulin and HOMA-IR index were significantly higher in all patients with coronary atherosclerosis compared with relevant persons without CHD (native: Men – C-peptide 2.53 ± 0.18 vs 0.77 ± 0.17 ng/ml; insulin 19.41 ± 2.08 vs 8.23 ± 0.38 mU/ml; HOMO-IR index 4.75 ± 0.50 vs 1.57 ± 0.08, p = 0.000; Women – C -peptide 2.99 ± 0.29 vs 0.89 ± 0.18 ng/ml, p = 0.000; insulin 18.52 ± 2.01 vs 11.75 ± 0.52 mU/ml, p = 0,002; HOMO-IR index 4.36 ± 0.62 vs 2.48 ± 0.17, p = 0,000; non-native: Men – C-peptide 2.35 ± 0.12 vs 0.29 ±

0.04 ng/ml; insulin 19.15 ± 1.06 vs 7.98 ± 0.27 mU/ml; HOMO-IR index 4.63 ± 0.27 vs 1.83 ± 0.07, p = 0.000; Women - C-peptide 2.78 ± 0.38 vs 0.46 ± 0.06 ng/ml, p = 0.000; insulin 21.79 ± 4.75 vs 9.63 ± 0.47 mU/ml, p = 0.001; HOMO-IR index 6.25 ± 1.32 vs 2.08 ± 0.12, p = 0.000, respectively) (Table 1).

The significant ethnic and gender differences in groups of patients have been identified. Among native women without CHDwere higher of insulin and HOMA-IR index levels, than men (insulin 11.75 ± 0.52 vs 8.23 ± 0.38 mU/ml; HOMO-IR index 2.48 ± 0.17 vs 1.57 ± 0.08, p = 0.000, respectively). In non-native women without CHD were higher of C-peptide and insulin levels compared with men (C-peptide 0.46 ± 0.06 vs 0.29 ± 0.04 ng/ml, p = 0.004; insulin 9.63 ± 0.47 vs 7.98 ± 0.27 mU/ml; p = 0.000, respectively).

In both native groups (patients and persons without CHD) and among non-native persons without CHD the significant differences depending on place of residence are revealed.

In rural non-native men with coronary atherosclerosis was significantly higher of C- peptide level compared with urban men (2.63 ± 0.14 vs 2.13 ± 0.17 ng/ml, p = 0.011, respectively).

Table 1

Comparative characteristics of the glucose- insulin indicators in theexamined groups of men and women, M±m

Groups			Glucose, mmol/l	C-peptid, ng/ml	Insulin, mU/ml	Index of HOMA-IR
1 group CHD (+) Native	Men (n=189)	urban	5.62±0,18	2.41±0.21	16.16±1.09	4.38±0.40
		rural	5.25±0,11	2.60±0.27	21.40±3.26	4.98±0.77
		total	5.39±0,09	2.53±0.18	19.41±2.08	4.75±0.50
		p	$p_{1-3}=0.000$ $p_{m-w}=0.067$	$p_{1-3}=0.000$	$p_{1-3}=0.000$	$p_{1-3}=0.000$
	Women (n=28)	urban	5.55±0.45	3.04±0.46	19.91±3.67	5.49±1.55
		rural	4.81±0.17	2.97±0.38	17.87±2.46	3.83±0.55
		total	5.07±0.20	2.99±0.29	18.52±2.01	4.36±0.62
		p	$p_{1-3}=0.000$	$p_{1-3}=0.000$	$p_{1-3}=0.002$	$p_{1-3}=0.001$
2group CHD (+) Non-native	Men (n=207)	urban	5.69±0.18	2.13±0.17	18.09±1.61	4.47±0.42
		rural	5.35±0.10	2.63±0.14	20.55±1.20	4.83±0.31
		total	5.50±0.10	2.35±0.12	19.15±1.06	4.63±0.27
		p	$p_{2-4}=0.059$	$p_{2-4}=0.000$ $p_{c-c}=0.011$	$p_{2-4}=0.000$ $p_{c-c}=0.060$	$p_{2-4}=0.000$
	Women (n=32)	urban	6.53±0.72	2.89±0.57	22.70±7.27	7.00±1.99
		rural	5.78±0.36	2.57±0.33	20.17±3.41	4.93±0.93
		total	6.22±0.45	2.78±0.38	21.79±4.75	6.25±1.32
		p	$p_{2-4}=0.000$ $p_{1-2}=0.007$ $p_{m-w}=0.052$	$p_{2-4}=0.000$	$p_{2-4}=0.001$	$p_{2-4}=0.000$
3group CHD (-) Native	Men (n=108)	urban	4.20±0.07	0.65±0.14	7.36±0.40	1.37±0.07
		rural	4.23±0.07	0.88±0.29	9.02±0.61	1.76±0.14
		total	4.22±0.05	0.77±0.17	8.23±0.38	1.57±0.08
		p		$p_{3-4}=0.029$ $p_{c-c}=0.066$	$p_{c-c}=0.050$	
	Women (n=145)	urban	4.89±0.08	0.97±0.24	11.67±0.67	2.47±0.15
		rural	4.32±0.14	0.80±0.30	11.84±0.83	2.49±0.31
		total	4.49±0,11	0.89±0.18	11.75±0.52	2.48±0.17
		p	$p_{m-w}=0.072$ $p_{c-c}=0.000$	$p_{c-c}=0.001$	$p_{3-4}=0.004$ $p_{m-w}=0.000$	$p_{3-4}=0.026$ $p_{m-w}=0.000$
4group CHD (-)	Men (n=104)	urban	5.14±0.10	0,28±0.06	7,70±0,37	1,74±0,08
		rural	5.28±0.09	0.30±0.05	8.26±0.40	1.92±0.10
		total	5.22±0.07	0.29±0.04	7.98±0.27	1.83±0.07
		p	$p_{3-4}=0.000$ $p_{m-w}=0.009$			$p_{3-4}=0.000$

Non-native	Women (n=126)	urban	4.94±0.12	0.55±0.10	10.66±0.84	2.33±0.22
		rural	4.91±0.09	0.38±0.06	8.69±0.42	1.86±0.10
		total	4.92±0.07	0.46±0.06	9.63±0.47	2.08±0.12
		p	$p_{3-4}=0.000$	$p_{m-w}=0.004$	$p_{m-w}=0.000 p_{c-c}=0.094$	$p_{m-w}=0.071$

Conclusion. In patients with coronary atherosclerosis increased levels of C-peptide, insulin and HOMA-IR index compared with persons without clinical signs of CHD. Among inhabitants of Yakutia coronary atherosclerosis was closely correlated with elevated levels of glucose (r=0.344, p<0.01), C-peptide (r=0.713, p<0.01), index of HOMA-IR (r=0.581, p<0.01), and insulin (r=0.566, p<0.01), that consistent with the fact that hyperinsulinemia and insulin resistance are keys starting torque of atherosclerosis [1, 5, 6, 10].

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Determination of Control Locus Form as a Diagnostic Criterion For Successful Treatment of Obesity

ABSTRACT

In order to define a control locus form in obese patients and a degree of its influence on effectiveness of weight loss 58 people aged 25-56 years with body mass index of more than 27, 0 kg/m2 were studied. The nutrient mixture «Slim» (FF specialized dry food mixed composition «Slim») was applied. The evaluation of the control locus form at first revealed that some patients being externals at baseline, moved into the group of internals at the end of treatment; no people underwent the reverse transition . In a group of patients who were externalities in the early treatment and at the end changing form of control locus, potency in the weight loss is of intermediate value, but the highest degree of commitment is revealed. It was found that the best compliance with the program for short-term weight loss was typical for patients with predominant externality. In the long term there is a trend towards greater commitment to the recommendations of the internals.

Keywords: locus of control, externality, internality, obesity.

INTRODUCTION

Effective methods of obesity treatment are known: adequate diet therapy and physical activity. All other methods of excess weight correction are auxiliary. Surgical operations, in fact, can radically change the course of the pathological process, but does not affect the behavioral characteristics of a person who just lead to overeating and subsequent sets of overweight. Considering the high frequency rate of obesity, clinicians and scientists from different countries, in turn, are actively looking for ways to increase the commitment of proven conservative procedures to obese patients , however, no reliable methods for predicting have not been worked out [7].

The degree of compliance can influence the shape of control locus – concept in psychology characterizing property of the person to attribute their successes or failures of internal or external factors. The tendency to attribute the results of external factors is called "external locus of control" (externality), internal factors – the "internal locus of control" (internality). Internal factors here are those of the individual properties of the individual as their own efforts, their own positive and negative qualities, the presence or absence of the necessary knowledge, skills, etc. To determine the locus of control questionnaire used J. Rotter [8].

In this regard, we do not exclude, but rather emphasize the fact that the control locus of a patient may affect the dietotherapy to a greater degree, defining externality or internality for better characteristics. In fact, if internality patient himself takes responsibility for their actions in the process of weight loss and the results and follows a policy of constructive cooperation, then the externality patient would rather wait for a dominant part in his fate of others – your doctor, family, and most agree that favorable changes in his life for himself can't afford [3]. On the other hand externalities are easy-going and led by a bright new idea. They are interested in something and try to learn. Their success in any case can't be sustained, but rapid and pronounced. Internals, standing defined goals, go

to them gradually, without obvious ups and downs; they are more interested in long-term. Hence internal people should, in our opinion, better diet, to work with your doctor to find out the circumstances on which the effect of the treatment and gradually accept all the changes within their lives, while the "externalities" patients will soon enjoy instant results against the background of close cooperation with the medical program, and then search for the reasons why they fail to adhere to certain recommendations at the end of such, in unison, their psychological orientation are increasingly allowing externalities feeding behavior [4]. Because of the current relevance of nutrition-related diseases is high [6], and the question of the effect of diet therapy, depending on the locus control shape has not been yet studied, we have attempted to study it.

The aim of our research is to determine the shape of locus of control in obese patients and the degree of its influence on the effectiveness of weight loss.

MATERIALS AND METHODS

In this study, we analyzed the results of compliance programs, we reduce the weight of 58 people – 13 men and 45 women aged 25-56 years who are overweight and obesity (BMI> 27.0 kg / m 2). Among them there were 25 internals, 33 externalities.

The study used the nutrient mixture of "Slim" (FRR dry specialize Rowan-food mixed composition "Slim"). Specifications TC 9197-005-54050164-13 [5].

Patients comply with the combined program of the application of the nutrient mixture FRR "Slim": two days a week for free choice, they held a series of rules that allow them reduce the daily caloric intake [1], in particular:

- Make food less fat compared to baseline;
- Make meals less sweet compared to baseline;
- It is reasonable to treat wounds, use them after meals and not instead of;
- Use techniques that help to slow down the act of eating;
- Eating fractional with moderate portions at frequent intervals;
- Eat smaller portions than in the previous period;
- To develop food dietary fiber;
- Reduce alcohol consumption compared with baseline.

Nutrient mixture patients these days are produced in a total amount of 4 servings per day, 1 serving before lunch and dinner, and other portions are instead of a snack during the day and another – as a light snack before bedtime.

For the other five days a week, patients comply with the discharge mode, which was an afternoon handling and set as follows: patients were allowed one meal a day of their choice, which is recommended in building mainly of low-fat products. Instead other meals, as well as for snack overnight patients received 5 portions nutrient mixture, vegetable-conductive weighing about 800 g bran and 2-3 slices of bread to 30 grams each.

Patients are encouraged to make daily walks briskly pro-duration 30-40 minutes a day. This target heart rate were at the height of the load does not exceed 110-115 beats per 1 minute, subjective-controlled absence Corollary discomfort, shortness of breath and palpitations.

As a self-observation, patients kept a diary, where they mentioned the nature of actual nutrition and physical activity.

The patients adhere the above diet and lifestyle to 12 weeks. In the process of adherence to once every 4 weeks, patients were examined, measured their weight, waist and hip circumference, analyzed diaries nutrition and physical activity.

In addition, all patients were asked to visit the "School of obese patients", which consisted of 5 sessions including theoretical material, practical exercises, interactive communication and discussion with the lecturer unclear point, answers to questions. These schools have a great success in treatment of obesity [2].

In order to assess the form of locus of control questionnaire used test level of the subject-foot control (ACC) J. Rotter [8].

The quantitative characteristics of the studied parameters were subjected to statistical analysis, is to calculate the arithmetic mean value. In order to determine the differences of arithmetic values used t-test Student. It evaluates the significance of differences of arithmetic values between groups of surveyed people at a significance level ($p<0,05$).

RESULTS AND DISCUSSION

Table 1 shows data characterizing the severity of the effect of reducing the body weight, in the observed group of men and women and the correlation dependence of the effect of weight loss on the sex, age and initial body weight of the patient.

As it can be seen from the data, if the effect is to provide absolute Dig-Arts (the difference between the initial and final weight in kilograms), the more pronounced results are observed at men. However, in presenting the result as a percentage of the original weight, this difference is leveled, and therefore, we believe, does not look at-all credible allegations, occurring in a number of studies that the effect of losing weight in men is usually higher than that of women. It has to be noted that the expression of results in the percentage of the original weight is mentioned more frequently in literature. It is believed that it reflects the situation rather better than the effect in kilograms. Specifically, on the representation of the effect of a percentage of the original, you can build a qualitative classification of weight loss results (poor, fair, good).

Accurate correlation effect of initial body weight is observed in both men and women, but only if the result is expressed in kilograms. When expressing the result as a percentage of initial body weight for this lost-dependence (males $r=0,09$; $p>0,05$, women $r=0,11$; $p>0,05$).

When evaluating the locus control forms at the beginning and end of the survey we revealed that some patients being externalities at the initial stage, after moved into the internal group; no people revealed who committed the reverse transition. Data on the number of lower weight and percent reduction in body weight are presented in Table 2.

As can be seen from the data of incidence rate of weight loss the good results were noted in patients with externality direction than with internal one: 70.0% and 64.0%, respectively. The percentage of weight loss was also greater in the subjects with external locus of control form of 4.9% and 3.3%, respectively. In our opinion it is caused by externalities within the framework of close cooperation with the doctor in the classroom at the "School of obese patients" were better motivated and got interest in success.

In addition, a new subgroup has been distinquished: the patients who had been externalities at the beginning of treatment, at the end changed it into the internal locus of control orientation. Their effectiveness concerning the weight reduction took an intermediate value (4.0%), and the degree of commitment to the highest degree (76.9%). This indicates that the externality is considered to be more advantageous in terms of compliance to

the proposed treatment inheriting some features of Internalities: such patients get more readiness and eagerly start therapy and are likely to follow longer observation and wider medical advices that requires further study, prolonged without close medical escort.

The Internality type of reaction in the long term may play a key role for successful weight loss, a problem faced by many doctors. People with a dominant of internal type are subject to take responsibility for their weight on, to work with a doctor to find out the methods and techniques that will help them to rebel-twist metabolism. People with predominance of externalities would rather wait for more activity from the doctor will look for help in tablets, conspiracy coding. They are more likely to abandon any action that decided "that all the demon-useful", "that they nothing can help," but in the early stages of therapy, this type of reactions, of more interested in healing activities and requires reasonable control.

CONCLUSION

It was found that better compliance to the program for short-term weight loss phase is in patients who have higher externality. In the process of working closely with physicians the effectiveness of treat is more clearly. In the long term, there is a trend towards greater commitment to the recommendations in patients with a form of internal locus control. This form (external-internal) specifies that patients with primary internality rather associate their health problems with their own actions, they are responsible for taking the decision to change them, to a greater degree of consistency and are ready for a long time to implement the recommendations.

The latter circumstance makes the actual development program, including a lengthy briefing of the patient, built on a series of studies on the type of school, involving not only the message to the patient specific knowledge, but also the cooperation with them aimed at developing skills (persistent habits) to comply with the norms of a healthy diet and healthy life. Along with the direct medical recommendation is important to convince the person slimming discuss everything strange and difficult moments with your doctor. If there is a situation of failure (and it certainly occurs), the patient should not "hide" and stop treatment, but together with physician must analyze causes of it – his body's adaptation to new conditions of supply or refusal of secret assignments.

In accordance with the results of this study at the beginning of nutritional correction of excess weight is necessary to determine the locus control form, and with patient of external orientation build communion in a trusted, but at the same time demanding way. On the one hand externals often offer encouragement from the outside on the others, but it is also necessary for such patients let them understand that the success in the weight reduction greatly depends on their own efforts.

Table 1

Dependence of efficiency of weight loss programs on gender, age and initial body weight of patients

Dependence Sex	Lose weight effect (кг)	By comparison with the initial weight (%)	The correlation coefficient of the effect of weight reduction with age	The correlation coefficient of the effect of weight reduction from the initial body weight*
Men (n=5)	9,6±1,82	9,1±1,78	-0,67	0,76
Women (n=43)	7,2±1,73**	10,3±1,27	-0,54	0,54

* Expressed effect of reducing weight in kilograms

** Differences between the groups are reliable ($p<0,05$)

Table 2

Dependence of the effect of weight reduction in obese patients
on the locus control shape in dynamics

а) Indicators / б) Locus control shape	в) Total		г) Lose weight		д) Weight reduction, %
	е) Абс.	ж) %	з) Абс.	и) %	
к) Internal – internal	л) 25	м) 43,1	н) 16	о) 64,0	п) 3,3*±1,8
р) External – external	с) 20	т) 34,5	у) 14	ф) 70,0	х) 4,9*±2,1
ц) External – internal	ч) 13	ш) 22,4	щ) 10	ы) 76,9*	э) 4,0±1,2
ю) Total/ average	я) 58	аа) 100	бб) 40	вв) 69,0	гг) 3,9±1,8

* Difference between the confidence index (p<0,05)

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Nutritional and Biological Value of Siberian whitefish (CoregonussardinellaValenciennes) in the Republic of Sakha (Yakutia)

ABSTRACT

The article presents results of studies of nutritional and biological value of the Siberian Indigirka population whitefish of autumn-winter catchof the Republic Sakha (Yakutia). It is found that by the number of protein the Siberian whitefish refers to average protein, and by fat content – to particularly fatty types of fish and high-caloric foods.

Keywords: Siberian whitefish, nutritional and biological value, Yakutia.

INTRODUCTION

The Siberian whitefish in the rivers of Yakutia conducting semi-anadromous life can be found in all the rivers flowing into the Laptev Sea (Anabar River, Olenek), the East Siberian Sea (Lena River, Yana, Indigirka, Kolyma). For feeding period it uses shelves of the rivers. In the fourth year of life reaches sexual maturity. First spawning run occurs in July-August, the second - in September and October months. Fishing for whitefish starts from age 4 + to 9 + years, the size of the fishing whitefish length is from 220 to 360 mm, weight 150 to 330 g [5].

The Siberian whitefish in the Republic of Sakha (Yakutia) is one of the main commercial fish; its stocks are in satisfactory condition (Table. 1) [5].

Table 1

The main indicators of whitefish in the river basins of the Sakha Republic

Year	In the Republic of Sakha (Yakutia)	The basins of major rivers				
		The Anabar	The Lena	The Yana	The Indigirka	The Kolyma
1990	2200.7	6.0	385.3	-	587.4	1141.5
1994	461.7	5.5	246.7	110.5	25.7	79.4
2000	876.5	13.5	183.6	247.4	155.3	276.7

Nutritional and biological value of the Siberian whitefish in Yakutia is studied a little. For example, some studies of the chemical composition including mineral content were investigated [1. 8. 5].

Considering the fact that the Siberian whitefish in a diet of theYakuts is one of the first places we have to develop advanced technologies for production of fish products from whitefish goal - to explore the food and biological value of the Siberian whitefish.

METHODS AND MATERIALS

For the research we selected autumn-winter fish of Indigirka population of the Republic of Sakha (Yakutia) for 2013, frozen at a temperature not higher than -30 °C in a modular unit for freezing products (MUZ 07-10) and then stored in glaciers and freezers at a temperature not higher than -15 °C.

For the analysis of samples 3 fish samples were selected for fillets and belly division prepared according to standard GOST procedures 31339-2006 "Fish and non-fish objects and products. Acceptance rules and methods of sampling".

Nutritional and biological value was determined by results of the study of the biochemical composition by infrared spectroscopy on the infrared analyzer SpectraStar (model 2200, “Unity Scientific USA” firm), calibrated on the basis of generally accepted standard chemical methods in the laboratory processing of agricultural products and biochemistry analysis of the Yakut Scientific Research Institute of Agriculture.

Amino-acid scorewas calculated by the formula: (mg AA per 1 g test protein)/(mg AA per 1 g protein of the ideal x 100) [6].

RESULTS AND RESEARCH

Morphological composition. Live weight averaged 366.8±11.00 g, 202.3±5.40 g of fillet weight (55.13%), waste of 164.50±2.70 g (44.97%), 20.4±1.10 g (12.4%) viscera, 32.0±2.10 g (19.5%) head, 48.4±3.00 g (29.4%) fins, scales 21.7±1.60 g (13.2%), skin 19.7±1.50 g (12.0%), bones 22.2±1.80 g (13.5%).

Chemical composition and energy value. Chemical composition and energy value was determined on the basis of the study of the biochemical composition. The result of studies (Table. 2) fillet and belly of Siberian whitefish on the amount of protein refers to average protein (10-15%). Thus, the protein content in the fillet was 15.37 ± 0.007, in belly 14.88 ± 0.004%. By fat content in belly (25.25 ± 0.049%) whitefish is particularly fatty types of fish (more than 15%). As a result of the high content of protein and fat whitefish refers to high-calorie food (200-300 kcal).

Table 2

Chemical composition and energy value of whitefish fillets and bellies, wet weight

Indicators	Unitofmeasure	Quantity	
		In fillet	In belly
Water	%	74.61±0.015	80.25±0.049
Proteins	- «» -	15.37±0.007	14.88±0.044
Fats	- «» -	9.08±0.010	25.25±0.049
Ash	- «» -	2.37±0.003	0.78±0.001
Energy value	kcal/100 g	143	286

The content of macro-and micronutrients.Research results and their analysis showed that the highest content of macro-and micronutrients was observed in bellies (Table. 3).

The content of heavy metals in the fillet does not exceed the maximum permissible concentration (MPC), and in belly plumbum content is of 0.7 times, 0.5 times hydrargyrum, cadmium 0.1 times more the maximum permissible concentration (Table. 3).

Exceeding the maximum permissible concentrations of heavy metals may depend on their propagation in the environment, including in water bodies.

Table 3

The content of macro-and micronutrients in the whitefish fillets and belly, wet weight

Indicators	Unit of measure	Quantity	
		In fillet	In belly
Macronutrients			
Calcium	mg/100 g	37.38±0.036	49.73±0.207
Phosphorus	- «» -	198.07±0.113	236.65±0.647
Magnesium	- «» -	43.40±0.036	55.36±0.199
Potassium	- «» -	223.55±0.083	252.49±0.484
Micronutrients			
Fe	mg/100 g	13.49±0.012	18.61±0.088
Mn	- «» -	0.79±0.002	0.98±0.003
Zn	- «» -	14.24±0.015	19.45±0.088
Cu	- «» -	0.35±0.001	0.48±0.003
F	mkg/100 g	2.00±0.003	2.76±0.012
Cr	- «» -	34.52±0.030	44.16±0.160
Mo	- «» -	10.83±0.009	14.30±0.059
Co	- «» -	108.26± 0.102	142.99±0.583
I	- «» -	12.36±0.009	15.25±0.049
Se	- «» -	33.04±0.027	42.11±0.155
Heavy metals			
Plumbum	mg/kg	1.02±0.001	1.39±0.006
Hydrargyrum	- «» -	0.11±0.009	1.14±0.005
Cadmium	- «» -	0.11±0,009	1.14±0.004

Note: MPC: plumbum - 1.0 mg/kg; hydrargyrum - 0.6; cadmium - 0.2 mg/kg (Sanitary Norms and Rules 2.3.2.560-96).

Amino-acid composition.Studies of amino acid composition showed that Siberian whitefish contains all the essential amino-acids (Table. 4). Predominate the essential amino-acids such as leucine, lysine. Wherein the total level in their belly is above (28.56 g/100 g) as compared with fish fillet (26.83 g/100 g).

Analysis of amino-acids shows that by quantitative content dominated alanine, cystine, arginine. They accounted for from 80.03 to 93.75 g/100 g in fish fillets and belly of the total amino-acids, respectively.

Table 4 shows that the whitefish has a high biological value - the amount of amino-acid score is above the benchmark (over 100%).

Table 4

Amino-acid score of whitefish fillets and belly, wet weight

Indicators	Fillet		Belly		Ideal protein (Food Committee of the World Health Organization) g/100 g of protein
	g/100 g of protein	SCORE, %	g/100 g of protein	SCORE, %	
Valine	7.14	142.8	5.48	109.56	5.0
Isoleucine	6.81	170.25	7.19	179.75	4.0
Leucine	13.88	198.28	15.39	219.86	7.0
Lysine	12.95	235.45	13.17	239.45	5.5
Methionine	4.18	418.0	5.07	507.0	1.0
Methionine + cystine	7.06	201.71	9.06	258.86	3.5
Threonine	8.37	209.25	10.12	253.0	4.0
Tryptophan	2.09	209.0	1.09	109.0	1.0
Phenylalanine	7.56	252.0	9.25	308.0	3.0
Phenylalanine + tyrosine	7.87	131.17	9.82	163.67	6.0
Alanine	13.21	440.33	15.81	527	3.0
Glycine	4.62	92.4	5.66	113.2	5.0
Proline	8.59	122.71	10.67	152.43	7.0
Serine	8.07	269.0	10.28	342.67	3.0
Tyrosine	7.22	240.67	9.50	316.67	3.0
Cystine	18.35	917.5	23.16	1158.0	2.0
Arginine	48.47	969.4	54.78	1095.6	5.0

Fatty acid composition. Results of fatty acid analysis shows that the samples are dominated monounsaturated acids, the ratio of which is polyunsaturated 2:1 (Table. 5). The total content in the samples of linoleic and linolenic acids is (0.37 and 0.53 g/100 g of lipids) relating to biologically active polyunsaturated fatty acids forming part of the vitamin F (essential fatty acids), which plays an important role in biochemical processes within the organism.

Bellies by content of fatty acids are different from the fillets. In whitefish belly a higher ratio of polyunsaturated to saturated fatty acids (more than one) was detected, indicating the good biological effectiveness (Table. 5).

Table 5

The content of fatty acids in whitefish fillets and belly, g/100 g wet weight

Indicators	Quantity	
	In fillets	In belly
Fattyacid, total	10.35±0.012	16.54±0.042
Saturated, total	2.30±0.023	3.39±0.012
Monounsaturated, total	5.29±0.007	9.10±0.021
includingoleicacid	1.99±0.003	3.05±0.009
Polyunsaturated, total	2.76±0.003	4.05±0.009
– linoleic $C_{18:2}$	0.19±0.0002	0.27±0.001
– linolenic $C_{18:3}$	0.18±0.0002	0.26±0.001
– arachidonic $C_{20:4}$	0.17±0.001	0.12±0.0003
The ratio of polyunsaturated to saturated fatty acids	3.50	3.87

Vitamin content. Except substances that provide the body with energy, the advantage of foodstuff comprise physiologically active substances, especially vitamins.

Vitamin composition in whitefish is diverse (Table. 6). So, first of all whitefish fillets and belly are rich in set of fat- and water-soluble vitamins. Established that the content of the fat-soluble vitamin D in whitefish belly is slightly higher (20.97 mg/kg) compared with a fillet portion (15.47 g/100 g). Similar differences are observed at personal comparison. They have quite a lot of B vitamins, low vitamin D and B9 compared with literature data [2.3].

The presented data also shows that the highest vitamin content was observed in belly.

Table 6

The vitamin content of whitefish fillets and belly, wet weight

Indicators	Units of measure	Quantity	
		In fillet	In belly
Fat-soluble			
A	mkg/100 g	78.84±0.068	101.99±0.388
D	- «» -	15.47±0.018	20.97±0.090
E	mg/100 g	1.06±0.003	1.42±0.007
Water-soluble			
B_1(thiamine)	mg/100 g	6,43±0,009	8,91±0,041
B_2(riboflavin)	- «» -	2.01±0.003	2.76±0.015
B_3 (pantothenicacid)	- «» -	6.55±0.007	8.99±0.041
B_6(pyridoxine)	- «» -	4.28±0.006	5.69±0.023
B_{12} (cobalamin)	mkg/kg	6.38±0.006	8.77±0.041
Vitamin C	- «» -	9.05±0.009	12.06±0.050
H (biotin)	- «» -	5.48±0.007	7.57±0.035
PP (niacin)	mg/100 g	5.18±0.007	7.01±0.029
B_9(folacin)	mkg/100 g	10.36±0.009	13.25±0.049

CONCLUSION

It was found that Siberian autumn-winter whitefish of Indigirka population of the Republic of Sakha (Yakutia) by the protein content it relates to average protein, by fat to particularly fatty types of fish and high-calorie food, the content of macro-and micronutrients and vitamins whitefish has the high biological value .

High nutritional and biological value of the Siberian whitefish makes it a valuable food product for the organism of the northern regions inhabitants with the necessary amount of nutrients, including a biologically active substance, during severe and long winters.

This study was completed at the Yakut Scientific Research Institute of Agriculture (Yakutsk, Russia).

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Use of Polymeric Sorbents ForProcessing Fruit Pomace For Healthy Diet

ABSTRACT

In order to obtain pectin powder a hardware-technological scheme of fruit pomace processing using polymeric sorbents is designed. At the stage of pomace extraction in the scheme polymer sorbents and electroactivated aqueous solution (anolyte) sodium chloride were used. This powder can be used as a food additivein the canning, confectionery and bakery.

Keywords: fruit pomace, polymeric adsorbents, extraction, pectin powder, electrochemical activation, anolyte.

Fruit pomaces contains valuable mineral and organic acids, pectin and other extractive substances and therefore can be used in various food purposes [7].

Nowadays improvement of food technologies is seen due to application of intensive factors influencing both plant materials, and water solutions participating in processing raw materials. One of such factors is application of electrotechnologies including a method of electrochemical activation (ECHO) created more than 25 years ago and which has been distributed in many branches of food industry [1,3]. The ECHO allows directly to change acid-base and redox properties of water, to synthesize from water and dissolved substancesto chemical reagents (oxidizers or reducers) in metastable state [2].

Use of polymeric sorbents is a new perspective direction in processing industry on industrial production from secondary vegetable raw materials of food powders [7].

The aim of this research is to receive fruit powder from fruit pomace by impact of the ECHO method on low-concentrated salt solutions. As a result of carrying out the ECHO in a zone of one of electrodes a metastable product anolyte is obtained, possessing increased selective extracting ability.

The hardware and technological scheme applied in production of apple powder includes the following processes and the equipment:

Extraction of fresh pomace was carried out withNaCl salt aqueous solution electroactivated in an anode camera of the diaphragm electrolyzer with concentration of 0,1%, pH 3,5 and redox potential Eh = 0,65 at temperature 60C degrees within 20 minutes in a screw extractor at a ratio of firm and liquid phases 1:5.

Polymeric sorbents were applied fordivision of liquid and firm fraction[6].

Regeneration of polymeric sorbents was carried out in a centrifuge for receiving liquid fraction [5];

Powder was obtained by vacuum evaporation with subsequent low-temperature drying in the spray evaporator.

As a result of carrying out extraction we received extract and pro-extracted pomaces.

The extract enriched aromatic, dyes, organic acids is possible to use in production of nectars and juice drinks, and the pomace rich with cellulose and pectinaceous substances can be used in receiving food powders. Powder production was divided consistently into three steps by wiping of pro-extracted pomaces in apulpifier,

vacuum concentration and drying. The pectin extract concentration was carried out in a vacuum evaporating set at boiling temperature not above 60C to the content of solids 20-25%.

The concentrated solution was distributed into a spray drier by a pump, it being dried due to thin dispersion of 5-10 sec. at temperature 140C till moisture of a ready-made product of 4-6%.

High intensity of moisture evaporation during the drying process was reached due to thin dispersion of a dried-up product in the drying camera. Thus, at the expense of big surface of the contact the drying process lasted 4 - 15 sec. This circumstance allowed to receive a qualitative powdery product, well soluble and not demanding further crushing. The powder after drying is packed up in a tight container.

The received powder can be restored by water, thus mashed potatoes are formed. The fruit concentrate can be used for production of kissels and mousses, and also as a food additive in confectionery production and bread baking. In comparison with known technologies such powder has higher nutrition value and a bigger period of storage.

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Food Security and Analysis of Actual Nutrition in the Russian Federation and Sakha Republic (Yakutia)

ABSTRACT

Theoretical aspects of food security of the Russian Federation are considered. The comparative analysis of the actual food according to selective inspection of budgets of house farms during 2001, 2008-2012 and epidemiological research of the actual food in the Republic of Sakha (Yakutia), the Russian Federation and in federal districts is carried out.

Keywords: doctrine of food security of the Russian Federation, demographic indicators, general incidence, actual food, epidemiological research, selective inspection of budgets of house farms, foodstuff, macronutrients, power value of diets.

INTRODUCTION

Food security is one of major components of state economic security, thus a role of food supply for social stability in both social and economic spheres is of great significance. Historical experience shows that solution of food supply problem as a man's survival cause is a basic factor of social stability in any nation [1].

Long discussions on this problem in state authorities of all levels led to adoption of the Doctrine of Food Security RF by the Decree of the President of the Russian Federation №120 of January 30, 2010. According to this document, the term "food security" is defined as: "Food security is a state of national economy that ensures food independence of the Russian Federation, guarantees physical and economic availability of food for each citizen meeting requirements of legislation of the Russian Federation on technical regulation in volumes not less than rational standards of food consumption necessary for active and healthy lifestyle" [2].

Diseases related to malnutrition include alimentary obesity and digestive system pathology. In the modern world higher prevalence of overweight and obesity, gastroenterological pathology, malnutrition is noted. Epidemiologic studies on overweight, obesity, and actual nutrition in particular regions of the world and Russia are considered relevant and a great number of works are devoted to this theme [4].

The Sakha Republic (Yakutia) is the largest region of the country and one of the least populated territories, the population in 2012 was 955.500, including 620.500 urban population and 335.000 rural population. In 2012, the natural population increase on 8.000 people was noted. Improving the demographic situation in the region was significant in rural areas where the natural population growth in 2012 was 10.2 for 1.000. The natural growth of urban population was 7.4 for 1.000. The demographic indices of the republic increased significantly (twice) in comparison to 2000, thus the ratio of the natural growth (for 1.000) made 4.0 in 2000 and 8.5 in 2012 [3].

At the same time, the index of general morbidity increased up to 10664.7 cases for 10.000 in 2012. In the structure of general morbidity infectious and parasitic diseases amounted 2.6%, endocrine system diseases, nutrition disorders, metabolic and immune system imbalance - 1.4%, circulatory system diseases – 3.0%, digestive organ diseases – 8.1% [3].

Thus, the analysis of actual nutrition and food status in the republic is of importance.

The research is aimed at studying actual nutrition and food status of population in the Sakha Republic (Yakutia), the Russian Federation, and federal regions.

The research is based on statistics of per capita food consumption in the Russian Federation including data of the sample survey of household budgets from 2008 to 2012, statistics of demographic indices and general morbidity rates in the Sakha Republic (Yakutia), data from the state report "On the State of Sanitary-Epidemiological Wealth of Population in the Russian Federation in 2013", findings of epidemiological investigation of actual nutrition of the population in the Sakha Republic (Yakutia).

RESULTS

To estimate food security, the following scorecard consumption is used:

- disposable resources of households in population groups;
- provision of a trade and catering per 1.000;
- food consumption per capita;
- volume of targeted assistance to the population;
- human daily caloric intake;
- human daily intake of protein, fat, carbohydrate, macro- and microelements;
- consumer price index for food [2].

The results of the analysis of per capita food consumption in the Russian Federation according to data of sample survey of household budgets in 2008-2012 showed positive dynamics of consumption of dairy, eggs, fruit, and berries. Comparing with 2012, their volume increased up to 21, l, 17 and 11 kg, respectively. Consumption of bakery and potatoes decreased by 3 kg in comparison with 2002 (Fig. 1) [5].

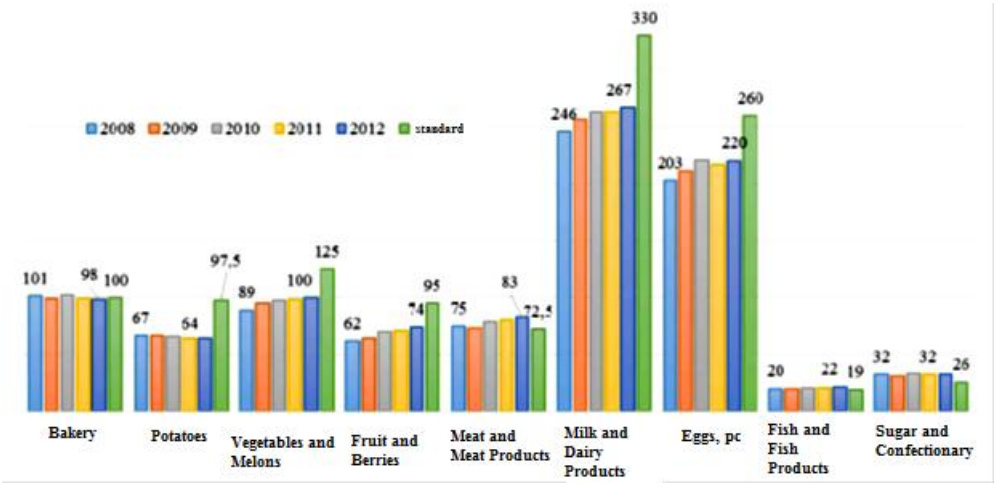

Fig. 1. Dynamics of per capita Consumption of Basic Food Groups in the RF, kg/year

The data of actual food consumption by basic food groups in federal regions and the Russian Federation in general are given in Table 1. The values of necessary food consumption volumes are taken as the standard rate according to "Recommendations on Rational Standards of Food Consumption Meeting Modern Standards of Healthy Eating" approved by the Order of the Health Ministry and Social Development of the Russian Federation No. 593 n on August 2, 2010 [1].

Table 1

Food Consumption by the Russian Federation population,
per capita, per year

Territory	Bread and Bakery, kg	Potatoes, kg	Vegetables, kg	Meat and Meat Products, kg	Milk and Dairy Products, kg	Eggs, piece
Rational consumption rate	95	95	120	70	320	260
2008						
Russian Federation	**119**	**111**	**99**	**66**	**242**	**252**
Central Federal District	116	100	88	70	224	249
North-West FD	105	82	84	67	255	262
Southern FD	123	99	131	67	225	279
North-Caucasus FD	125	98	138	48	211	186
Volga FD	115	130	97	62	287	265
Ural FD	130	11	90	65	208	266
Siberian FD	132	133	98	66	267	248
Far-Eastern FD	**119**	**123**	**107**	**70**	**189**	**225**
2012						
Russian Federation	**119**	**111**	**109**	**74**	**249**	**276**
Central Federal District	118	106	100	81	233	281
North-West FD	103	84	92	74	276	289
Southern FD	122	99	145	76	237	302
North-Caucasus FD	127	109	166	56	237	215
Volga FD	115	123	104	69	286	282
Ural FD	125	109	94	70	211	286
Siberian FD	128	132	101	73	264	263
Far-Eastern FD	**116**	**125**	**109**	**78**	**192**	**244**

The statistical data analysis for the period 2008-2012 shows deviations of the rational nutrition rates in all federal districts in all groups of food. In the Far-Eastern federal district, the rate of dairy consumption is significantly lower than average Russian rates both in 2008 and 2012: population consumes 22 and 23 per cent less dairy products, respectively. Besides, the 5-year-dynamics indicates some increase of rates of per capita consumption of potatoes, vegetables, meat products, and eggs (2, 2, 8 kg and 19 pieces, respectively).

Evaluation results of statistics on food consumption using a method of budget survey of families in the Sakha Republic (Yakutia) in dynamics for the latest 5 years indicate the increase of actual food consumption in all main food groups, excluding bakery products and potatoes: vegetables and (water)melons by 14 kg, fruits and berries by 10 kg, meat and meat products by 10 kg, milk and dairy by 16 l, eggs by 10 pieces, fish and sea products by 4 kg, sugar and confectionery by 4 kg. The results of epidemiological investigation of actual nutrition suggest high consumption of such products, as bakery and sugar, confectionary almost twice as more.

For 2012, the increase of average Russian rates in bakery products, meat and meat products, milk and dairy products by 10, 5, 12 kg, respectively (Fig. 2) [6].

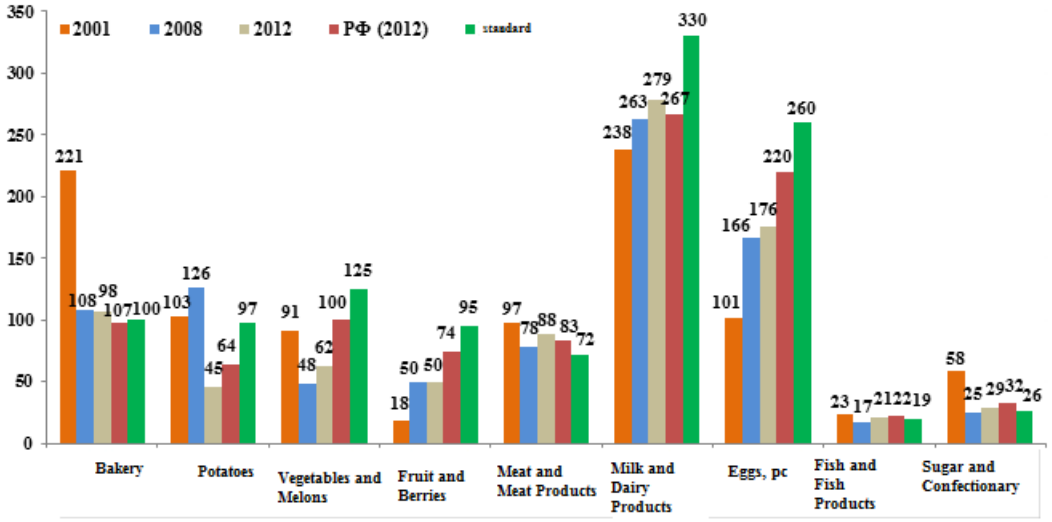

Fig. 2. Dynamics of Average Consumption
of Basic Food Groups by the Sakha Republic (Yakutia) population, kg/year

In Yakutia, the aberration of rational nutrition (underconsumption) is noted according to actual consumption of potatoes by 2 times, vegetables and melons by 38 per cent, fruit and berries by 19 per cent, milk and dairy products by 15 per cent, eggs by 20 per cent less in 2012.

According to the analysis of macronutrient provision of food rations at the Russian Federation population in comparison with the average recommended standards there was excess in fat by 15.7 per cent, carbohydrates by 15.2 per cent, insignificant deficiency of protein by 0.5 per cent (Table 2) [5].

Table 2

Average Consumption of Nutrients and Calorie Diets of the Russian Federation population

Indices	Average recommended standards of consumption*, g/day, kcal	Average Consumption in Russian Federation, g/day, kcal			Specific Density of Population with Under-consumption, %		
		2010	2011	2012	2010	2011	2012
Protein	87.5	76.6	76.7	77.5	86.8	99.1	56.4
Fat	91	104.5	104.7	105.3	18.4	12.7	4.9
Carbonhydrates	402.3	348.4	340.6	341.0	95.6	96.2	92.3
Calorie Content	2 751.0	2 652.4	2 323.6	2 633.3	91.6	74.5	70.6
*The recommended nutrient consumption standards by the Russian Federation population is recalculated (taking into account specific density of different population groups / MP 2.3.1.2432—08 The Standards of physiological need in energy and nutrients for different population groups of the Russian Federation/)							

54.4 per cent of the population of the Russian Federation are subjected to protein deficiency. The problem of population nutrition is excessive consumption of fat observed by 95.1 per cent of the population. Specific density of the population consuming products containing fat increased by 13.8 per cent in comparison with 2010. The rate of carbohydrates consumption in most regions of the Russian Federation (92.3 per cent) is lower than the average recommended values. Carbohydrates deficiency in diets is determined, first of all by low consumption of vegetables and fruit. Low calorie content of diets of 70.6 per cent of population is observed, this rate decreased by 0.7 per cent in comparison with 2010 [5].

In the Sakha Republic (Yakutia) the evaluation analysis of statistics on food consumption by the method of budget survey indicated excess of fat by 13.2 per cent, carbohydrates deficiency by 16.2 per cent, as well as protein deficiency by 12 per cent as compare with the average recommended standards of consumption in diets. The calorie content of diets decreased by 5.7 per cent (Table 3) [6].

Table 3

Consumption, Nutrient and Energy Content of Food in Households
(the average per capita in household) in the Sakha Republic (Yakutia)

Indices	Average recommended standards of consumption*, g/day, kcal	Average Consumption in Sakha Republic, g/day, kcal		
		2008	2010	2012
Protein	87.5	71	77	77
Fat	91	92	105	103
Carbohydrates	402.3	319	341	337
Calorie content	2 751.0	2 399	2 626	2 594
* The recommended nutrient consumption standards by population of the Russian Federation is recalculated (taking into account specific density of different population groups / MP 2.3.1.2432—08 The Standards of physiological need in energy and nutrients for different population groups of the Russian Federation/)				

The rate of consumption of macronutrients by the population of the Sakha Republic (Yakutia) as well as in the Russian Federation as a whole evidences imbalanced nutrition patterns with the tendency towards increased consumption of products with saturated fat and decreased consumption of complex carbohydrates which results in risk of development of metabolic disorders, increase of cardiovascular diseases, neoplasms, endocrine disorders, including diabetes.

Excessive consumption of fat and simple carbohydrates contribute to an increased risk of pancreatic diabetes. The sickness rate of insulin-independent pancreatic diabetes diagnosed for the first time was 223.14 on 100, 000 people (in 2011 – 219.97; in 2010 – 207.90). The increase of the sickness rate of insulin-independent pancreatic diabetes of the whole population in 1.1 times since 2010 was observed. The insulin-independent pancreatic diabetes incidence of the whole population above the average Russian was registered in 42 regions of the Russian Federation, with the highest levels being observed in the Sakha Republic as well (1.4 times higher) [5].

CONCLUSION

The analysis of per capita food consumption by the population of the Russian Federation for 2008-2012 showed positive dynamics in consumption of dairy products, eggs, vegetables, and meat products.

In the Far-Eastern federal district, the indices of dairy consumption are substantially lower than those of Russia in average both in 2008, and 2012.

In the Sakha Republic, the increase in actual food consumption was found in dynamics for the last 5 years in all main food groups, excluding bakery, meat and meat products, milk and dairy products by 10. 5, and 12 kg, respectively. In 2012, Yakutia featured under-consumption of potatoes 2 times, vegetables and melons by 38 per cent, fruits and berries by 19 per cent, milk and dairy products by 15 per cent, eggs by 20 per cent.

The analysis results of macronutrient rations provision of the Russian Federation population in comparison with the average recommended standards of consumption in rations showed the excess in fat by 15.7 per cent, carbohydrates by 15.2 per cent, insignificant deficiency of proteins by 0.5 per cent. Protein deficiency is experienced by 56.4 per cent of the Russian Federation population, specific density of the population consuming products containing fat increased by 13.8 per cent in comparison with 2010.

In the Sakha Republic (Yakutia), the evaluation results of statistics on food consumption by the method of budget survey indicated the excess of fat by 13.2 per cent, carbohydrates deficiency by 16.2 per cent, as well as protein deficiency by 12 per cent in comparison with the average recommended standards of consumption in diets. The calorie content of diets decreased by 5.7 per cent.

Sickness rates of insulin-independent pancreatic diabetes of the whole population of the Russian Federation increased 1.1 times in dynamics since 2010. In the Sakha Republic, this rate is 1.4 times higher than the average Russian.

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V.B. Spirichev

Vitamin D_3 + 12 Vitamins as a Modern Concept of Effective Use of Vitamins in Prevention of Human Diseases

ABSTRACT

Realization of numerous and vital functions of vitamin D in a human body closely depends on supply of an organism with all other vitaminsnecessary for formation of hormonally active form of vitamin D and normal implementation of the vital biochemical and physiological processescontrolled by it.The above mentioned proves expediency of the combined use of vitamin D and a complex of all other 12 vitamins as in the medical, andpreventive purposes (the concept vitamin D + 12 vitamins)

Keywords: vitamins, vitamin D, vitamin D – the action mechanism, 1α, a 25-dioxyivitamin of D, a role of vitamins, vitamins supply.

The tremendous success has been achieved for the last decades in the study of the vitamin D exchange and mechanism has clearly demonstrated the vital role of its **hormone-active** form,**1α,25-dioxyvitamin D,**not only in rickets prevention among children and osteoporosis prevention among the elderly but also in decreasing the risk of the most frequent and gravest modern diseases, such as cardiovascular, oncologic diseases, diabetes and a large variety of others being the main reason of the early disability and death of many million people.

This huge amount of data presented in dozens of thousands of publications by independent authors served as a scientific basis for the practical proposals on the wide use of vitamin D aimed at reducing risk and preventing the abovementioned diseases. Those proposals were considered by European Parliament and USA Senate in spring and summer 2010.

Both European Parliament and the U.S. Senate discussed the proposal on increasing the recommended daily use rate of this vitamin from 200-400 IU (5-10 μg) to 2000 IU (50μg) per day. However, this proposal has never been formally adopted as a general compulsory practice – at least, until the present time.

Such guardedness is rather understandable, for it is widely known that vitamin D has rather narrow therapeutic amplitude and, if used in doses exceeding one's physiological need, may cause hypercalcemia and metastatic calcification of such vital organs as heart and kidneys.

In the 40-50s of the last century one of the outstanding pediatricians used to say that an experienced doctor must be able to lead a baby "between the Scylla of rickets and the Charybdis of D-hypervitaminosis".

Now it is not only pediatricians that are facing the problem to the full extent but also many other specialists, primarily nutritionists dealing with the adult and aged people.

The more so as the duality ofeffect produced by vitamin D depending on the dose has also been discovered by modern studies of the impact this vitamin has on the frequency and outcome of the cardiovascular, oncologic and other diseases.

An obvious example of such duality is the result of a research published by a group of authors in October publication ofAm.J.Clinic Nutrition, 2010 [28]. Within 13 years the authors of the research had watched the state of

health of 1194 men at the age of 71 and older who had a concentration of 25-oxyvitamin 25(OH)D in the blood serum at the beginning of the research, which is the most reliable indicator of sufficiency of vitamin D in the body of the examined.

It was found that the dependence of general mortality within the research period on the original sufficiency of vitamin D in the bodies of the examined had a U-nature, i.e. was definitely higher for the men with both originally low and originally high sufficiency of vitamin D. For instance, approximately 50% higher mortality was recorded both among the men with the original concentration of 25(OH)Din the blood plasma being lower than 46 nmol/l (<115 ng/ml) and among the men having the same indicator higher than 98 nmol/l (<245 ng/ml) [28].

This being the case, considering the inconsistency of the available information on the admissible limits and possible consequences of the decrease of the recommended vitamin D consumption rate, as well as of the absence of relevant positive decisions from the European and American higher governmental bodies, we find it reasonable, at least, at this stage to approach the problem of enhancing the provision of vitamin D to the population masses in a slightly different and, to our opinion, a more efficient and safer way.

To be more specific, we must try to identify and eliminate the problems of nutrition faced by a modern man which are still the biggest obstacle both to the natural transformation of vitamin D in a human body into its hormonal form and to the realization of the abovementioned vital functions by this form.

In this context, we find it reasonable to turn to the results of the research carried out in 1980-90s at the **Laboratory of Vitamins and Mineral Substances at Institute of Nutrition RAMS**by the then Senior Fellow of the laboratory and current professor at South Dakota University **Igor Sergeev**together with his young associates: a postgraduate from the Republic of Cuba **Raul Fernandez Regladoand** a postgraduate from North Korea **Kim Ren Ha**.

In his research that served as a basis for his doctoral thesis, I.N.Sergeev has clearly demonstrated the role of a large variety of **vitamins** both **in the biosynthesis of the hormone-active form of vitamin D: 1,25(OH)$_2$D** and in the realization of its multiple vital functions [7, 31], basing on vast experimental material.

Let us consider these data in more detail.

Table 1contains information on the specific role of **vitamins C, B$_2$, B$_6$, PP, folic acid,α-tocopherol and vitaminK**in the biosynthesis process and the mechanisms of realization of the specific functions of the hormone-active form of this vitamin, i.e. 1,25(OH)$_2$D$_3$ [6, 7].

For instance, **ascorbic acid** ensures normal realization of the **steroidogenesis** processes, including the synthesis of the primary predecessor of vitamin D, cholesterol [8, 27].

Coferment forms of **vitaminB$_2$** (riboflavin) comprise the active center of the flavoproteinmonooxigenases responsible for the hydroxylation of vitamin D in the process of its transformation into a hormone-active form 1,25(OH)$_2$ D [7, 9].

Nicotinomidecoferments (derivatives of nicotinamide – **vitamin PP**) are necessary as a source of regenerative equivalents in the abovementioned processes of hydroxylation of vitamin D with the production of1,25(OH)$_2$of vitamin D [7].

Folic acidis responsible for maintaining the proliferative capacity of cells, including those of the bone tissue in the process of its growth and renewal[7].

VitaminE as an antioxidant acts as a protector of the microsomal and mitochondrial hydroxylases, including those taking part in the synthesis of the hormone-active form of vitamin D [7, 10].

Vitamin Kparticipates in the post-translation modification of the calcium binding proteins, including the one, which synthesis on the genetic level is induced by the hormone-active form of vitamin D [11-13, 30, 32].

Table2shows the results of the experimental research by I.N.Sergeev and his associates demonstrating the certain character and depth of the specific disorder of synthesis and mechanism of $1,25(OH)_2D$ in the conditions of deficiency of each of the mentioned vitamins in the organism [7].

There are good reasons to compare the information on a certain role of the above listed vitamins in the creation and realization of the vital functions of the hormone-active form of vitamin D with the data on the real provision of the abovementioned vitamins to the population of the developed countries, specifically, with the results of the **mass studies of provision of vitamins to large groups of child and adult population in Russia** pursued by Institute of Nutrition RAMS both in the 90s of the last century and in the last 5-7 years [16, 19, 20] using most reliable up-to-date methods and criteria based on the direct analytic definition of the concentration of vitamins and activity of the corresponding vitamin-dependent ferments in the biological fluids of the organism (blood, urine) [23].

The results of these surveys expressly speak for the **insufficient consumption of vitamins as the most popular deviation of nutrition from the rational physiologicnorms**.

Most serious problems concern the consumption of vitamins C, B_1B_2, B_6, folic acid and beta-carotene, which deficiency is typical for the significant share of the child and adult population of the Russian Federation.

For instance, the 1983-92 examination of the adult working population of Moscow, Yekaterinburg, Kuzbas, Norilsk, Bashkiria, Mari El and other cities and regions of Western and Eastern Siberia and the farm workers of Kuban revealed the deficiency of vitamin C among 88% (70% suffering strong deficiency), B vitamins (B_1, B_2, B_6) among 60-80% (30-47% suffering strong deficiency), folic acid among 80-85% (25-30% suffering strong deficiency) of all the examined [1-5, 17-23, 26].

The examination of preschool and school-aged children of Moscow, Yekaterinburg, Orenburg and other cities conducted in the same years revealed the deficiency of vitamin C in 27 - 63%, folic acid in 23 - 30%, B_1in 40 - 58%, B_6in 24 - 70% cases, accordingly. 23-32% of the examined children suffered strong deficiency of vitaminsB_1, B_2, B_6 and ascorbic acid [4, 14, 15, 25].

According to the March-April 2001 examination of Moscow schoolchildren, 38% of children had the vitamin C deficiency (according to its level in blood), 79% - vitamin B_2 deficiency,64% - vitamin B_6deficiency, 22% - vitamin E deficiency and84% of children had beta-carotene deficiency.

A similar examination among the schoolchildren of the first four grades in St. Petersburg in February 2006 showed the vitamin C andB_1deficiency among 50%and vitamin B_2 deficiency among 30% of the examined. Only 10% of children had a more or less sufficient level of all three vitamins. Half of the examined population suffered from combined deficiency of two or, rather, three vitamins at once.

In October 2007, specialists of the Laboratory of Vitamins and Mineral Substances at Institute of Nutrition RAMS in cooperation with OGK-2 employees conducted an objective survey of the vitamins C, A, E, B_2, B_6 and beta-carotene sufficiency among the staff of various departments of OGK-2 branch of Pokrovskaya GRES power plant – in all, 174 men and women [2].

Despite the autumn season, which is abundant in fruit and vegetables, the **vitamin C** deficiency was discovered among **34.8%** of the total number of the examined staff, 6 people having strong vitamin C deficiency and 2 being close to scorbutic.

The situation turned to be even worse with **B vitamins** that are found not in vegetables but in high-quality meat products. For instance, **vitaminB_2**insufficiency was discovered among**47.4%** of the examined (**82** people from **174**) and**vitaminB_6**deficiency among 72.6% (**126**people). **108**people (62%) hadlow**beta-carotene**levelintheirblood**.**

Only 5 women (!)from152 men and womenhad a sufficient level of all 6 vitamins, and no such men were found at all. 64% of women and 84 % of men had **combined deficiency of two, three or four vitamins** at once [2].

The September 2010 survey conducted among the children of 11-17 that were going in for swimming under control of the Nutrition Department for Healthy and Sick Children at the Scientific Children's Health Center RAMS showed that the level of Vitamin E in their blood was below the line among 30.8% of children, vitaminB_2among 53.8% andbeta-carotene among 79.5% of children. Combined deficiency of 2-4 vitamins was found among 73.9% of boys and 56.2% of girls. Only one girl from 39 examined children had the necessary level of all the above mentioned vitamins [21].

Thus, summarizing the numerous data based on the results of the clinical and biochemical examination of the representative child and adult groups in various regions of the country, we can characterize the general vitamin situation among the child and adult population of the Russian Federation in the following way:

1. The revealed deficiency implies not one single vitamin but has the form of combined vitamin C, B vitamins and carotene deficiency, which is **polyhypoavitaminosis**.

2. The vitamin deficiency may be found not only in spring but also in the summer and autumn period, which seems to be most favorable time of the year, and thus is characterized as a **permanent negative factor**.

Insufficient consumption of vitamins and a number of mineral elements with food is not some specific trait of the food status of the Russian population but is a common problem in all the developed countries. It emerged as an unavoidable consequence of a strong socio-economic and scientific-and-technical progress, which led to the sweeping reduction in energy expenditure and the relevant decrease of the general amount of food being the source of energy and consumed by modern man.

Physiologic need of vitamins and mineral substances of a human organism have been formed in the course of the human evolution as a species and the human metabolism has gradually adjusted to the amount of the micronutrients than he received with the large volumes of plain natural food that matched the large energy expenditure of our ancestors.

Within the last decades, the technical revolution and large-scale social changes resulted in the 2-2.5-time and greater decrease in human energy expenditure. Food consumption has, or must have, decreased accordingly – otherwise, it would lead to overnutrition, overweight, which means diabetes, hypertensive disease, atherosclerosis and other "civilized" diseases.

However, food is not only a source of energy, but also a source of vitamins, macro- and microelements. By reducing the general amount of the food consumed we inevitably doom ourselves to vitamin hunger, as well as to the deficiency of a number of vital mineral substances.

The calculations show that even the best diet involving the consumption of 2500 kcal per day (which equals average energy expenditure of a modern Russian) lacks, at least, 20% of most vitamins.

Without going into details of the reasons and consequences of this mass polyhypovitaminosis state among the population of the developed countries and the efficient methods of its correction and prevention, which is the subject of our other publications [17], we would like to underline here that the necessary condition of successful realization of all the vital functions of vitamin D discussed above is the **comprehensive provision of all vitamins responsible for the creation of the hormone-active form of vitamin D and successful realization of the multiple processes controlled by this form**.

Taking into account the wide spread of the polyhypovitaminosis state, especially among the older and elderly, we may suggest that perhaps the reason of some inconsistency or insufficient persuasiveness of a number of studies evaluating the efficiency of vitamin D in prevention of cardiovascular, oncologic and other diseases lies not

with the absence of such effect or insufficiency of doze of vitamin D but rather with **the lack of other vitamins necessary for the normal creation of the hormone-active form of this vitamin and (or) realization of its function in the organism**.

In this respect, it becomes clear that both the effective use of vitamin D in rickets prevention and the decrease of risk of the above mentioned grave diseases require the application of this vitamin **in combination with the complete variety of vitamins necessary for the realization of its useful features in the dozes meeting the physiologic needs of a human organism**.

These requirements are to a great extent met by multivitamin and vitamin-mineral complexes, as well as the vitamin-enriched protective diet products containing **vitamin D and the entire variety of the rest of twelve vitamins** in quantities providing **from50 to 100%**of the recommended daily rate (**The D+12 vitamins approach**).

Table1.

Role of vitamins in the processes of biosynthesis and realization of the specific functions of the hormone form of vitamin D (according to I.N.Sergeev, 1991) [7]

Vitamin C	Necessary for normal realization of the steroidogenesis processes
Vitamin B_2	In the forms of FMN and FAD, comprises the active centers of flavoproteinmonooxigenases responsible for the hydroxylation of vitamin D with the formation of its active oxyforms: 25(OH)D; $1,25(OH)_2D$
VitaminB_6	In the form of PALF, takes part in modification of some proteins, incl. receptors of steroid hormones
VitaminPP	In the form of NAD(F)N, is the source of regenerative equivalents in the process of synthesis of the vitamin D oxy derivatives: 25(OH)D; $1,25(OH)_2D$ and others.
Folacin (folic acid)	Plays an important role in the biosynthesis of proteins, including the fast-renewed protein receptors of the active forms of vitamin D
VitaminE (α-tocopherols)	As an antioxidant, acts as a protector of microsomal and mitochondrial hydroxylases taking part in the formation of active oxyforms of vitamin D: 25(OH)D; $1,25(OH)_2D$ and others.
VitaminK	Takes part in the post-translation modification of the calcium binding proteins

Table2.

Deregulations in the biosynthesis of functions of the hormone-active form of vitamin D in the conditions of insufficient level of other vitamins in the organism (According to I.N.Sergeev, 1991) [7]

Vitamin deficiency	25(OH)D concentration in blood	1(OH) activity of hydroxylase 25(OH)D in liver	$1,25(OH)_2D$ concentration in blood	Concentration of $1,25(OH)_2D$ used receptors in kidneys
C	↓	↓↓	↓	↓↓
B_2	↓	-	-	-
Folic acid	-	↓	-	↓↓
E	-	↓↓	↓	-
B_6	-	↓↓	↓	↑↑
K	-	-	-	↑

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Medical and Social Survey of Parents Living in the RS (Yakutia) on HLS

ABSTRACT

A survey of parents living in the Sakha Republic (Yakutia), concerning health of family members was carried out. The questionnaire also included questions about how parents instilled healthy lifestyle to their children, and importance of doctor's opinion in certain situations.

Keywords: children, healthy lifestyle, prevention.

INTRODUCTION

Positive attitude of parents to the health of their children, changing unhealthy habits, creating conditions for children to reach an optimal level of their health is of great importance in health promotion. The positive attitude to health reflects cognition, emotional and psychological readiness to change, aimed at improving, restoring health; it should be considered as a stage of motivation to formation to needs in health, readiness for change in behavior toward rehabilitation. Parents and health staff should convince children in need of health promotion, to create conditions for this and control this process [2].

Materials and methods study.

An anonymous survey of parents living in areas of Sakha (Yakutia) on health was conducted. Also parents were questioned how to instill a healthy lifestyle for their children and the importance of the doctor's opinion in certain situations. 1415 questionnaires were filled.

The results and discussion.

Now we will estimate the subjective parental assessment of the health status of family members and how to instill a healthy lifestyle for their children.

Almost 64,6% of respondents are completely satisfied with the health of family members in a rural family. Subjective parental assessment of children's health is usually very overrated. Most of adults are not well informed about the health status of their family members, and in particular about chronic diseases. From a sociological point of view, this trend expresses the growing backlog of awareness of parents, whose responsibility for the health of the child, for regular treatment to health care should be an important prerequisite for high-quality diagnosis and effective treatment of the disease. Absence of parents information about chronic diseases of their child can serve as a hypothetical indicator of the fact that the child does not receive appropriate treatment [1].

A sociological survey showed that 64.2% of parents instill healthy lifestyle to children. It is known that to be healthy, a person should, at least, to engage in physical exercise for thirty minutes a day. The total percentage of the engaged in physical culture and sports among the respondents is not very high and is only 36% and 46.5% of them do not do it. In these regions people believe that caring for the cows, chopping wood, snow removal and a lot of chores are the main methods of doing sports and this is also the physical education for rural areas.

Nutrition plays an important role in improving child health. Proper nutrition is the foundation for the prevention of many diseases. According to the parents' opinion, 61.2% of children permanently adhere to a diet, 24.5% do not comply with treatment, and 14.3% comply with treatment with some exceptions.

Smoking is an important factor of ultra high mortality of the inhabitants of Russia. Among our respondents, the problem of tobacco use is sharper - 51.4% because there are smokers in the family. Alcohol abuse is another reason of ultra high mortality of the population of Russia. 22.6% is abusing alcohol. But it is worrying that only 445 respondents from 1415 answer this question, the others decided to remain silent and missed this question.

The respondents were asked to answer the questions how important is the opinion of the doctor in the following situations.

1. 33.3% of respondents consider that in the organization of a healthy lifestyle from 80 to 100% depends on the opinion of a physician, from 50 to 70% think of 15.5%.
2. 28.3% of respondents think that possible diseases depend on the opinion of a physician – 80-100%, from 50 - 70% of respondents believe it is 14.6 %
3. 11.3% of respondents consider that getting a new job depends on the opinion of a physician - 80-100%, from 50-70% believe that it takes 17,2%
4. 7.9%t of respondents believe that the relocation - 80 - 100%, 15.8% of respondents - 50-70%.
5. 40.7% of respondents believe that the birth of a child - 80 - 100%, 10.5% of the respondents - 50-70%
6. 37.2% of respondents believe that the opinion of the doctor is important in the caring for children - 80-100%, 12.8% of respondents - 50-70%.
7. 17.9% of respondents believe the opinion of the doctor is important in the organization of normal family life - 80-100%, 15.4% of respondents - from 50-70%.
8. 17.1% of respondents – going in for sports – 80-100%, 16.6% of the respondents –ot-70% believe.

The conclusion from this is that a very high percentage depends on the opinion of a physician in the organization of a healthy lifestyle, child birth and child care .

Also the respondents were separately asked to indicate the most important profession in the first place in human life. The respondents who answered this question indicated that the most important profession is, primarily, the profession of doctor - 55.2%, in second place pointed to the profession of a teacher - 12%.

Conclusion

Based on the foregoing, there is a need to develop the program of creating a culture of healthy and safe lifestyles aimed at awakening in children the desire to take care of their health (formation of interest in their own health); the formation of installation to use a healthy diet; the use of optimal movement modes for children with regard to their age, psychological and other characteristics, the development of needs in physical education and sport; the application of the time of day recommended by doctors; the formation of knowledge of risk factors for children's health (decreased motor activity, smoking, alcohol, drugs and other psychoactive substances, infectious diseases); the formation of the skills of confrontation to involvement in tobacco and alcohol, and other substances; the formation of the child's needs safely consult a doctor for any questions related to the peculiarities of growth and development, health, development of readiness to maintain their health through the use of the skills of personal hygiene. Realization all these cases is impossible without the participation of physicians working in schools, kindergartens.

This cannot be achieved without new organization of medical support for students, including using modern automated systems and principles of screening diagnostics.

Medical assistance to pupils and students in educational institutions includes the system of organizational, diagnostic, therapeutic and preventive measures.

We consider it is appropriate to monitor actively the health status of children using a range of indicators: physical development, physical preparedness, acute morbidity level and missing classes due to illness, frequency of deviations in blood pressure from age-and-sex norms, a comprehensive assessment of the health (health promotion). The automated technologies as ADE for the diagnosis of health disorders of children in educational institutions can provide the invaluable help in this work [3]

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Relationship of Psycho-Emotional Stateand Bad Habits with an Expression of Dyslipidemiain the Yakutia Working Population

ABSTRACT

Medico-social, psychodiagnostic and biochemical studies of the working population of Yakutia were carried out. The survey covered bothrural (indigenous population) and urban residents (non-indigenous population). Analysis of lipid metabolism disorders in the population of Yakutia

revealed that one of the reasons expressed by deviations from the normal values of lipid metabolism in the indigenous population is smoking and alcohol consumption, possibly due to the low standard of living.

Keywords: low standard of living, personal anxiety, depression, alcohol, smoking, dyslipidemia.

INTRODUCTION

Under modern conditionshigh incidence rate ofthe population of Yakutianot only depends ona range of adversefactors relating toclimaticconditions ofliving, but it is possibly subjected to socio-economic changes for the last years as well[1]. The medical and socialresearch conducted in Yakutia has shownthat high levels oftrait anxietyresidents,first of all areassociatedwith low levels oflife[4,5,6].

In the meantimea state of prolongedemotional tensionis oneof the reasons forfailure ofadaptivereactions of an organism[3,11], andoneof the degradation factors of reservecapacity of the organismadaptationis lipid metabolic imbalance[12,13]. Alsoaggravatingfactors in the developmentof atherosclerоticvascular changesarebad habitslike smoking anddrinking alcohol.

Accordingly, the study of relationship of addictions and anxiety-depressive disorders with lipid metabolism of blood serum at new arrivers and indigenous population of Yakutia is of great significance.

The aim of this study was to identify association between serum lipid metabolism with quality of life, anxiety-depressive disorders and addictions (alcohol, smoking) in the working population of Yakutia.

MATERIALS AND METHODS

Infield conditionswe conductedmedico-social, psycho diagnosticandbiochemical studiesof the populationof working age(16 to60 years)living inrural and urban areasof the Republic ofSakha (Yakutia). The studyincluded214people livingin rural areas,and228employees ofan industrial sector, living inurban areas.The ethnic composition ofthe population surveyedwere as follows:100%of the indigenouspopulationamong villagers, 97%new arrivers among urbanpopulation.

The social and hygienicmethodof analysis (a survey questionnaire)studied conditionsand a way of lifeof the workforce.The questionnaire,developed bythe ILCYSCSB RAMS,included32 questions. Psycho-emotional stateof the populationhas been studiedusing standardizedmethods: Beck Depression Inventoryquestionnaire, the scale of self-esteemlevelof personal anxietyBHSpielberger-JLHanina.

Laboratory studies were carried out under conditions of constant internal and external quality control (FSEQC). Determination of the levels of total cholesterol (TC), HDL cholesterol (HDL cholesterol), triglycerides

(TG) were performed by enzymatic method for the automatic biochemical analyzer «Cobas Mira Plus» company «La Roche» (Switzerland) using reagents «Biocon» (Germany) . LDL (low density lipoprotein cholesterol) and VLDL (cholesterol VLDL) was calculated by the formula Friedewald et al. [15]. Atherogenic factor calculated by the formula proposed by AN Klimov [8]: Ka = (cholesterol - HDL cholesterol) / HDL-C.

Forhypercholesterolemiaacceptedlevel oftotal cholesterol≥ 5,0mmol / l, increased LDL-C≥ 3,0mmol / l, decreased HDL cholesterol levels≤ 1,0mmol /l in menandHDL cholesterol≤ 1,2in women.HypertriglyceridemiaattributedTG≥ 1,7mmol/ l.

Statistical data processing was performed using statistical software application package SPSS for Windows 17.0. Standard methods of variation statistics: Calculation of mean values, standard deviations, 95% confidence interval. Data in tables are presented as M ± m, where M - average, m - SEM. The significance of differences between mean values was assessed using Student's t test and the Kolmogorov-Smirnov test. The probability of the null hypothesis is accepted at $p < 0,05$. Correlation analysis was performed by the method of Pearson and Spearman.

RESULTS AND DISCUSSION

Comparative analysis of lipid metabolism revealed that urban residents showed significant increase in triglycerides (TG), total cholesterol (TC), anti-atherogenic fraction of high density lipoprotein cholesterol (HDL-C) compared to the rural population with significant increase in the atherogenic lipoprotein fractions low density (LDL). As a result of violation of the ratio of atherogenic and anti-atherogenic cholesterol fractions among rural inhabitants atherogeneity coefficient exceeded admissible norms, and was significantly higher than their urban counterparts (Table. 1).

The frequency ofdyslipidemiaamong indigenous people,adapted to the conditionsat high latitudes, indicatingexhaustionof functionalreserves of the bodyin which thedefense mechanismsand adaptivechanges in the bodycan give abreakdown -disadaptative[3, 9, 10, 14].

In urban areas,91%of the respondentslive in comfortablehomes, while in rural areas-only 2%. The remaining68% ofthe villagerslive in houseswith no amenities(with oven heating), 30% -with partial conveniences(central heating). Questioningrevealed thattheirliving conditionsin rural areasare not satisfied withmore than halfof respondents (53%), in the city -9%.The causes ofdissatisfaction withliving conditions, according to respondents, are as follows:the lack of basicfacilities, lack of living space anddilapidatedhousing.

58%of respondentsfeelthe villagershad significantfinancial difficultieson their ownassessment.At the same time12% of respondentshave shortage for food, 46% being with insufficientset of food, and only 4% of the population do not experiencefinancial problems.The remaining38%is enough moneytopurchasefood andessential commodities. Among those workingin the industry44% live in abundance,the remaining 56% classified themselves aspeopleof moderate means.

Analysis ofpsycho-diagnosticstudiesshowed that the levelof personal anxiety(RT)among the surveyedpersons of working agewas96.5% (moderate-67.8%, high -28.7%). Indicatorsof anxietyon average ingraduation"lowanxiety" were as follows:for men-3.4%among women-3.5%; "Moderateanxiety", respectively 69.2% and65.7% in terms of "high anxiety", respectively, 27.4%and29.1%. It should be notedthat high levels oftrait anxietywas significantlymore common amongrural residents($p < 0.05$). For example,one in threeof every fourvillagersandtownspeoplehave highRT.Dependingon the age ofthe highest frequencyof highradiotherapywas registered inthe age of30-39years, moderateand lowLT -in20-29 years($p < 0.01$). According to our datarevealedthat high levels ofradiation therapyis typicalfor peoplewhoseincomeis only enough forfood andessential items($p < 0.01$).

Rates of depressionamong the rural populationwas71.5%(moderate-33.3%, high -38.2%) among the urban population-36.6%(moderate-28.3%, high -8.3%). Dependingon the age ofthe highestfrequency ofthe high degree ofdepressionwas noted inthe age rangeof20-29and50-59years(28.6%and 28.4% of the total surveyedthe appropriate age). On genderdistribution, moderate and highlevels of depressionobserved in61.6% of women and 42.8%men.

The analysis of therelationship between the levelof depressionon the degree ofimprovementof housing andtheirsubjective satisfactionshowed thatthe worseliving conditionsand theirscore, thehigher the level ofdepression.Thus, the presenceof moderate tohigh degree ofdepressionwas observed in72.6% of respondents living in houseswith no amenities, 65%-with partial conveniences, 37% -with all the amenities. Amongthose surveyeddissatisfiedwith their housing conditions, 69% reportedthe presence ofdepressive symptoms.

As a resultof the correlation analysisthere was a significantrelationship between the degreeof depression andthe following factors:low socio-hygienic standard of living ($p < 0.01$), financial situation($p < 0.01$), sex ($p < 0.05$), the number of children($p < 0.05$), the degree of improvementof housing andsatisfaction withthem($p < 0.01$).

Depending onthe studyof lipidmetabolismofanxiety anddepression inpersons surveyedhad somepeculiarities.For example,workersinthe industrial sector, depending on the anxietywasa trend towardsan increase inthe levels of totalcholesterol andatherogenicLDLfraction. A statisticallysignificant decrease inHDL-Cwere foundin the group ofmild depression.

Statistically significant increasein bloodlipid metabolism(triglycerides, LDL, VLDLandatherogenic factor, respectively) was found inthe rural populationwith moderateanxiety.The highdegree ofanxietycombinesa significant increase inthe fractionof atherogenicLDL-C(Figure 1).

Dyslipidemiadependenceon the degree ofdepression amongvillagerscharacterizedstatistically significantincrease intriglycerides, LDL cholesterolandatherogenic factorin patients with highdepression(Figure 2).

Correlation analysisrevealed asignificant correlation betweendepression andcholesterol levels($\rho < 0,05$),LDL cholesterol($\rho < 0,01$),atherogenic factor($\rho < 0,05$)fromthe villagers.

Our resultsdo not contradict thedata in the literaturethat theeconomictransformations taking placein the country,had a negative impacton thepsycho-emotional state of the entire population, which led to an increase incardiovascular diseases, diseasesassociated with disturbedof lipid metabolism[2, 11].

Thus, low socio-hygienic standard of livinghas a significanteffect on thepsycho-emotional stateof the population andcontributes to thedisruption oflipid metabolism.Currently,due tothe above factors, this problem is moreacute forable-bodiedpeople in rural areasof the Republic ofSakha (Yakutia).

According tothe results ofthe questionnairerevealed thatnotconsume alcoholin rural areas- 42%, urban -15%;useon holidaysin the countryside-55% ofthe city-71%; often usedin the countryside- 3%,the city-14%.

Statistically significant increase in the level of atherogenic lipid fractions depending on the consumption of alcohol was found in persons living in rural areas and regular drinkers (Table 2). Atherogenic factor they have exceeded the norm almost 2 times. In the group of urban dwellers significant abnormalities in lipid metabolism were found. It should be noted that people who regularly consume alcohol, there was a trend toward increased levels of HDL-C. It should be noted that research AN Klimov, NG Nikulcheva (1999) "alcoholic HDL" lose their functional properties, that is, do not participate in the reverse transport of free cholesterol [8].

Despite the fact that alcohol consumption in rural areas less frequently compared to urban areas is observed in the indigenous population expressed disturbances of lipid metabolism in individuals who consume alcohol. According to research Kershengolts BM et al. (2000), the indigenous population of Yakutia in 1.7-2.4 times lower resistance to alcohol compared with the Caucasoid, due to a decrease in the body's ability to oxidize ethanol without

formation of elevated concentrations of acetaldehyde due to phenotypic features isozyme spectra of alcohol dehydrogenases (ADH) and aldehyde dehydrogenase (AlDG) [7].

The most commonlysmokedin rural areas-35%in urban areas-29%.Analysis oflipid profileamong smokersand non-smokerssurveyedpersonsaccording to thesocio-hygienic living conditionsrevealed thatdyslipidemiaobservedin smokersvillagers.Thus, theatherogenicfactorin smokersvillagersexceededthe normal valueby 1.7 times.In the group ofsmokerscitizensdyslipidemiawasless pronounced, which may be due toeating patternalien population(frequent consumption of vegetables, fruits) (Table 3).

Correlation analysis revealeda significant associationof lipidmetabolismwith smoking andalcohol consumption.Triglyceride levelsdepended onsmoking(ρ <0,05)and alcohol consumption(ρ <0,01).AtherogeniclipidfractionVLDLdependent onalcohol andsmoking(ρ <0,05).

Thus,one of the reasonsexpressed bydeviations from thenormal valuesof lipidmetabolism inthe indigenous populationissmoking and alcohol consumption, possiblydue to thelow standard of living.

CONCLUSION

The fight againstalcoholism among the populationand theprevalence of smoking,especially amongworking-age population, should be comprehensive. Create jobsin rural areaswith a decentsalaryincrease socialstandard of living, which will significantly improvethe psycho-emotionalstate of the populationof Yakutia.

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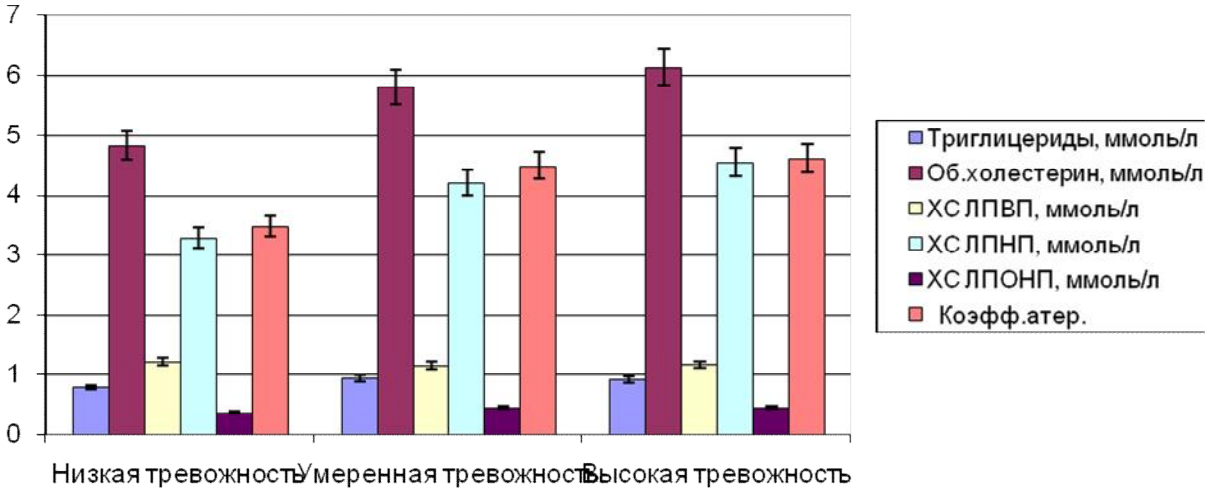
Table 1

Lipid metabolism inthe working age population(mmol / L)

Lipid metabolism	Village	Town	ρ
erides	0,94±0,05	1,08±0,05	< 0,01
Total cholesterol	5,89±0,11	6,27±0,12	< 0,01
HDL-Chol	1,15±0,04	1,65±0,04	< 0,01
LDL- Chol	4,25±0,12	4,08±0,09	< 0,05
VLDL - Chol	0,44±0,03	0,50±0,03	–
Atherogenicfactor	4,49±0,21	2,84±0,10	< 0,01



F

igure1. Dependence of thelipid metabolismofanxiety inruralnasleniyaYakutia

Низкаятревожность - Lowanxiety

Умеренная тревожность - Moderateanxiety

Высокая тревожность - Highanxiety

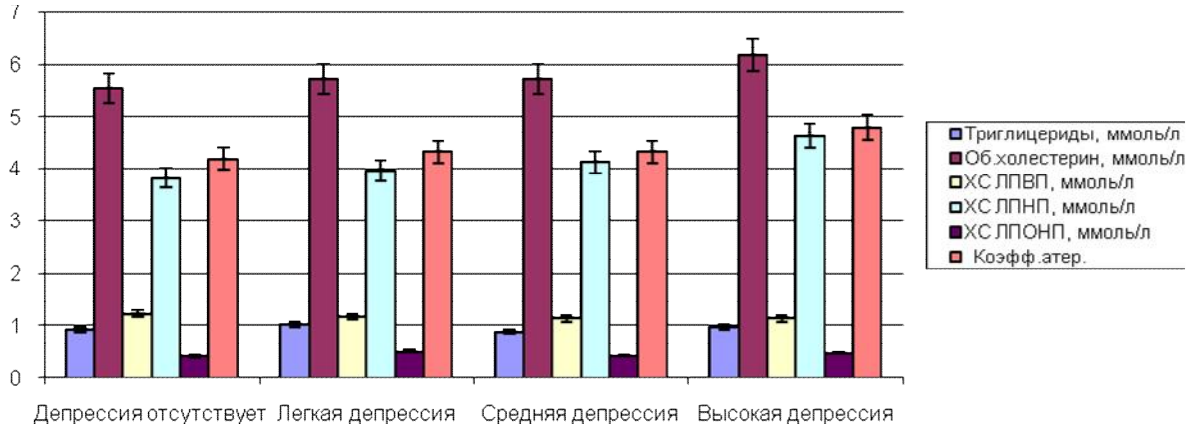


Figure2. Dependence of thelipid metabolismofdepression inrural population of Yakutia

Депрессияотсутствует – No depression

Легкая депрессия – Milddepression

Средняя депрессия – Averagedepression

Высокая депрессия - Highdepression

Table 2

Changes inlipid metabolism, depending on the alcohol (mmol/L)

Lipid metabolism	Village		Town	
	do not use	use regularly	do not use	use regularly
erides	0,84±0,05	1,17±0,16**	1,17±0,15	1,28±0,14
Total cholesterol	5,74±0,14	6,27±0,14**	5,99±0,28	6,56±0,30
HDL-Chol	1,14±0,04	1,17±0,08	1,52±0,09	1,59±0,09
LDL- Chol	4,11±0,15	4,57±0,16**	4,05±0,23	4,23±0,26
VLDL - Chol	0,40±0,03	0,53±0,08*	0,53±0,07	0,58±0,07
Atherogenicfactor	4,31±0,23	4,93±0,45 (^{x})	2,73±0,25	3,09±0,29

Note:* - ρ< 0,05; ** - ρ< 0,01; (^{x}) betweendrink- ρ< 0,01.

Table 3

Changes inlipid metabolismdepending onsmoking inthe working age population

(mmol / L)

Lipid metabolism	Village		Town	
	non-smoking	smoking	non-smoking	smoking
erides	0,84±0,04	1,31±0,21** (^{x})	0,95±0,06	1,29±0,89**
Total cholesterol	5,93±0,13	5,80±0,23	6,09±0,15	6,44±0,17
HDL-Chol	1,18±0,04	0,99±0,07**	1,74±0,05	1,62±0,07
LDL- Chol	4,26±0,13	4,20±0,23	3,96±0,13	4,14±0,14
VLDL - Chol	0,39±0,02	0,59±0,09*	0,43±0,03	0,62±0,05**
Atherogenicfactor	4,28±0,23	5,24±0,46 (^{x})	2,63±0,13	3,05±0,18

Note: * - ρ< 0,05 ; ** - ρ< 0,01; (^{x}) between smokers- ρ< 0,01.

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Metabolic Changes in Patients with Alcoholism in Yakutia

ABSTRACT

The change of biochemical parameters of blood in patients with alcoholism was investigated. High activity of enzymes, reflecting reserve possibilities of an organism, showed a decrease of adaptation in 50% of patients with alcoholism. A significant change in lipid metabolism is associated with the acceleration of lipid peroxidation. Hypovitaminosis and decreased activity of antioxidant system are the basis for the recommendations to include in the rehabilitation program of higher doses of vitamins and antioxidants.

Keywords: alcoholism, metabolism, adaptation, pro- and anti-oxidants

INTRODUCTION

Human adaptation to extreme climatic factors of the North is accompanied by tension of regulatory mechanisms and manifested as metabolic changes of proteins, fats, carbohydrates, vitamins, macro-and micronutrients. As a result, a polar metabolic type occurs, directing an organism to a new level of homeostasis. Contribution of carbohydrates in energy metabolism becomes lower, whereas fat's (lipids) are higher [5]. Overlaying additional negative factors such as alcohol causes changes in a level of basic biochemical constants (total protein, albumin, glucose, cholesterol, urea, and creatinine), and increases the need for substrates to excessively activated Krebs Cycle (TCA cycle). Work homeostatic system requires regulation and participation of a number of enzymes for supporting an adequate level of the basic substrates . Therefore, the change in the activity of enzymes in blood reflects the nature of metabolic adaptation mechanisms, and each parameter of blood including enzymological aspartate, alanin aminotransferase, gamma glutamyl transpeptidas is a good indicator of the metabolic changes [1,6].

In chronic alcoholism ethanol oxidation is accelerated by 50% due to induction of cytochrome P450. The catalytic activity of the microsomal enzyme associated with the formation of reactive oxygen species - superoxydanionradical and hydrogen peroxide, which may under certain conditions be able to damage the DNA structure. For this reason, in patients suffering from chronic alcoholism, often children are born with genetic malformations. Therefore, the problem of alcoholism remains relevant not only in social terms (growth of disability, mortality, crime), but also in terms of preserving a healthy gene pool.

In this regard, assessment of metabolic changes in chronic alcohol intoxication in the North is not only of theoretical but also practical interest. Elucidation of the mechanism of acute and chronic effects of alcohol on the human body should allow the practice of medicine to solve problems in the diagnosis, prevention and treatment of alcoholism.

The Aim of the Study. To study changes of the basic biochemical parameters and the state of pro- and antioxidant system in chronic alcohol intoxication in the North.

MATERIALS AND METHODS

We examined 60 people with chronic alcoholism at the age of 25 to 67 years. Among them there were 50 men, women - 10. All patients were treated with drug dispensaries. The comparison group consisted of 40 healthy people

who are not alcoholics. Determination of activity glutamyl transferase (GGT), and aspartic alaninovoyaminotransferaz (AST, ALT), alkaline phosphatase (ALP), total protein level (ON), urea, cholesterol, triglycerides (TG), glucose, uric acid in serum were performed on an automatic biochemical analyzer Cobasmiraplus company LaRoche.

Enzymatic antioxidant system (AOS) was evaluated by the activity of superoxide dismutase (SOD), catalase, glutathione reductase (GR), glutathione peroxidase (GP), nonenzymatic AOC - at blood concentrations of ascorbic acid, uric acid and the total content of low molecular weight antioxidants (Lmao). The intensity of lipid peroxidation was assessed by the level of malondialdegide (MDA) end dien conjugates (DC). In addition, we determined a level of thiamine - vitamin B1 blood.

Statistical data processing was performed using the statistical software application package SPSS forWindows 17.0. Standard methods of variation statistics: Calculation of mean values, standard deviations, 95% confidence interval. Data in tables are presented as M ± m, where M - average, m – error of the mean values significance of differences between mean values was assessed using Student's t test and the Kolmogorov-Smirnov test. The probability of the null hypothesis is accepted at $p < 0,05$.

RESULTS AND DISCUSSION

The average concentration of total protein (TP) in patients was equal to 73,9 ± 0,55g / l and ranged from 62.7 to 86,1g / l. Total protein level below 70.0 g / l was found in 13% of patients below the optimal level (75g / l) was found in 71.6% of patients.

Direct correlation of total protein and urea (0,357; $p < 0.01$) shows their coordinated decrease or increase, because they are an objective criterion optimal ratio processes of anabolism and catabolism. The average level of urea amounted to 5,54 ± 0,24 mmol / l. In 53% of patients had higher levels of urea optimum value (5 mmol / L). In 3 patients we found depletion of metabolic reserve: increase in urea (> 9,19mmol / l) and total protein (> 86,1g / l) was accompanied by a non-adaptive hyperenzymemia (ALT> 100ME; AST> 290ME; GGT> 209ME). In fact, all relevant indicators enzymes activity in patients differed from the control values. Thus, the activity of enzymes in patients with chronic alcoholism is significantly higher than in healthy controls: ALT 4.2 times, AST 4.4 times, GGT 5.7 times, alkaline phosphatase 1.6 times (Figure 1). Moreover, the highest rates of enzymes activity are observed in age groups of 30 and 40 years. Moreover, we observed increased activity of AST in the age group up to 70 years, where de Ritis coefficient (the ratio of AST / ALT) is equal to 1.86 at norm of rate 1.3, which indicates strengthening catabolism (Fig. 2). Intensification of the activity of transferases shows pathogenic mechanisms of alcohol metabolic disease. Known as the most sensitive marker of alcohol in the 1 stage the increase in GGT activity under normal ALT and AST defected only 4 people (6.66%) [1,2,7]. Normal GGT activity was detected in 30% of patients. Interim GGT activity was 41-100ME in 35%, higher (from 101-200ME) in 16.7%, and very high (more 200ME) in 18.3% of patients with alcoholism. Amplification GGT activity to maintain glucose at a minimum acceptable level in terms of amino acids deficiency leads to waste first amino acid, and then somatic (skeletal muscle) and visceral (internal organs) pool proteins [6]. During the transition of alcoholism in the 2 stage the increase of AST activity, but not ALT is noted. Cordial relations type AST / ALT (greater than 1.5) was found in 45.6% of patients examined, and only 2 patients (3.5%) the ratio of AST / ALT corresponds to normal values, ie from 1.3 to 1.5. The metabolic change in patients with "cardiac" related AST / ALT is characterized by increased catabolic processes, in particular for the deamination of amino acids by mitochondria activation. Alcohol abuse produces excess of acetyl-CoA with inhibitory effect on glycolysis (via inhibition of pyruvate kinase) and simultaneously indirectly stimulates increase in AST activity (via activation of pyruvate) and the synthesis of fatty

acids. AST increase precedes the simultaneous or delayed increase of ALT, and this is reflected in the change (quantitatively different) coefficient de Ritis from "cardiac" to "hepatic" type in the amplification of anabolism due to activation of the glucose-alanine shunt (GASH). So the remaining 50.8% of the patients had "hepatic" type of de Ritis with a parameter lower than 1.3. Integration of carbohydrate and protein metabolism plays an important role in any adaptive response of the organism [2,4,7].

Long-term alcohol consumption leads profound loss of hepatocytes. Changes in the functional state of hepatocytes leads to disruption of lipid metabolism. The mechanism of occurrence of disease caused by alcohol, on the one hand, the "deposit" of fatty compounds in the liver [2,4], and on the other, - chemical aggressiveness of acetaldehyde, which is manifested in the strengthening of free radical lipid oxidation pathways [8].

Increased level of cholesterol and triglyceride in the blood the surveyed patients as of person suffering from chronic alcoholism, accompanied by an intensification of lipid peroxidation. At the patient examined by us level both the cholesterol and triglycerides in blood was 1.8 times higher than in normal ($p < 0,05$), which increases the chance of developing atherosclerosis. 100% of patients examined the contents of total cholesterol greater than its optimum value (5.0 mmol / l). Increased levels of cholesterol and triglycerides in the blood of persons suffering from chronic alcoholism cause the intensification of lipid peroxidation. In a group of patients the concentration of malonodialdegide (MDA) was 1.6 times (60%) and diene conjugates (DW) in 2 times higher than in healthy individuals, as evidenced by the direct correlation with total cholesterol levels of MDA (0.274; $p < 0.039$) (Figure 3).

Direct high rate of de Ritis with MDA (0.408; $p < 0.002$) and DC (0.554; $p < 0.000$), identified in patients with alcoholism, evidence of the negative impact of the intensification of lipid peroxidation metabolism. A significant increase in MDA level in patients with activation of low molecular weight antioxidants (LMAO). Mid Lmao equal 0,115mkmol / ml and was 2.8 times higher than in healthy individuals. The positive relationship between MDA and LMAO at 0.438 ($p < 0.01$). Shows a negative correlation with the activity of SOD (- 0.282; $p < 0.042$) as well as the activity of SOD, depleting superoksidanionradikal actually did not differ from that in the control group (Figure 3).

A significant increase in the levels of diene conjugates in the survey group target group was accompanied by an increase in the activity of catalase, neutralizing hydrogen peroxide, as compared with a control group ($p < 0,05$).

It is the indirect evidence of activation of microsomal oxidation in a liver due

to induction of P450 cytochrome as catalytic activity of the enzyme is connected with the formation of hydrogen peroxide. Positive correlation Lmao and catalase at 0.468 ($p < 0.01$) shows a parallel activation nhe unit of enzymatic antioxidants at the exprense catalase.

The activity of the low molecular weight main endogenous antioxidant - glutathione reductase (GR) was 1.8 times lower than in healthy persons. GR restores glutathione - the main low molecular weight endogenous antioxidant, which is particularly high concentration in red blood cells and mucous internal organs.

Glutathione peroxide (GP) is an enzyme that breaks down hydrogen peroxide. The activity of the enzyme which is localized in the membrane of the erythrocytes, in patients with alcoholism, there was 1.5-fold higher than in the control group of healthy subjects. Uric acid level (an endogenous antioxidant) in the blood of individuals with chronic alcoholism, was 20% higher.

Long-term consumption of alcohol violates providing the body with vitamins end causes hypovitaminosis [3]. When assessing vitamin organism provision in patients with chronic alcoholism detected very low levels of ascorbic acid and vitamin B1 (lower than in healthy 1.6 times and 1.4 times, respectively) despite the fact that these vitamins are incorporated in rehabilitation. It is known that in the Nord of most of the population is experiencing gipovitaminoz

associated not only with insufficiend receipt food, but with increased requirements for vitamin at low temperatures [5].

Ascorbic acid is a powerful antioxidant. The average content of vitamin C was equal to 0,37 ± 0,02mg%, which is below the normal value. Hypovitaminosis C below 0.4% was detected in 75% of patients. Only 5 patients had an adequate content of ascorbic acid in the body. V1 vitamin deficiencies in patients suffering from chronic alcoholism, can be connected not only to increased utilization of these vitamins in the conversion of glucose in the body, but with malabsorption in the gastrointestinal tract. The glucose level in patients treated with in the control group were administered daily parenteral glucose actually no different from that group and corresponded 4,4±0,7 mmol/l, whereas for healthy persons intravenous glucose significantly increases its concentration in blood. Comparison of this fact with low thiamine levels confirms the well-known fact that long-term alcohol consumption disrupts energy processes related to carbohydrate metabolism.

Constancy of glucose provides catabolism intensive (marker AST), anabolism (marker ALT) level amino acids (marker GGT) and subject to the laws of biochemical homeostasis [1,8].

Thus, long-term toxic effects of ethanol in extreme climatic conditions is a negative factor destabilizing homeostasis. More than half of the surveyed patients there is an increase in blood levels of enzymes (AST, ALT, GGT), reflecting the metabolic adaptation mechanisms and provide for constancy of basic biochemical parameters. In 50% of patients with alcoholism low coefficient de Ritis shows a decline in adaptive reserves. Patients undergo a noticeable change in lipid metabolism and the body's supply of vitamins (vitamin deficiencies). This is probably due to the fact that at high latitudes metabolic adaptation is associated with increased lipid metabolism and endemic vitamin deficiency. Dysregulation of lipid metabolism characterized by hypercholesterolemia and gipertriglitserinemiey. The presence of dyslipidemia contributes to the activation of lipid peroxidation (0.274; $p < 0.039$). The increase in lipid peroxidation products is accompanied by a modification of proteins and peptides: diene conjugates and malon dialdegid can form Schiff bases with amino radicals, damaging the structure of the enzyme, and thus violate the metabolism, as evidenced by the high positive correlation coefficient de Ritis (AST / ALT) with malonaldehyde (0.408; $p < 0.002$) and diene conjugates (0.554; $p < 0.000$). Patients with a higher steady-state levels of lipid peroxidation products, revealed a lack of compensatory activation of the enzymatic antioxidant system. This fact is the basis for recommendation of inclusion of higher doses of vitamins, antioxidants in a rehabilitation program at alcohol intoxication.

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Fig.1. Indicators enzyme (ME) in the blood of patients with alcoholism

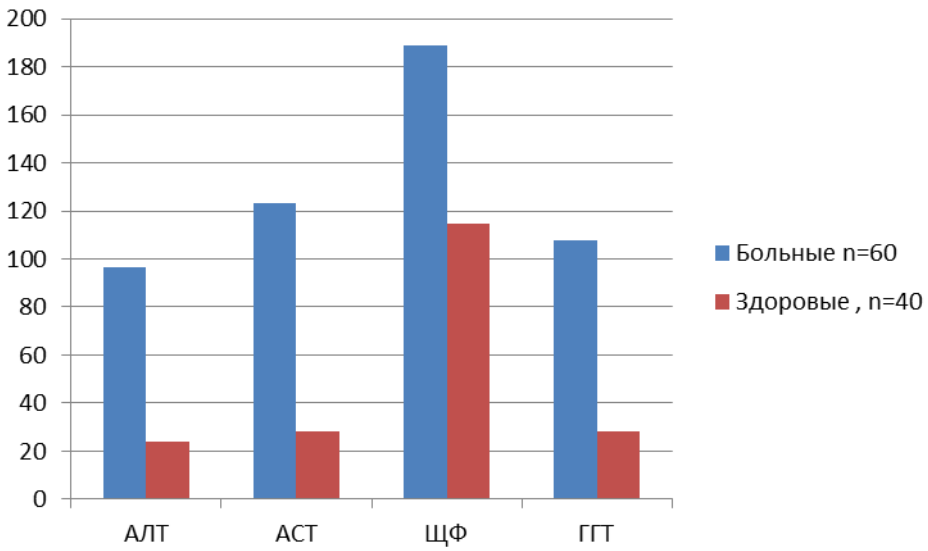


Рис. 2. Показатели активности ферментов (ME) в зависимости от возраста

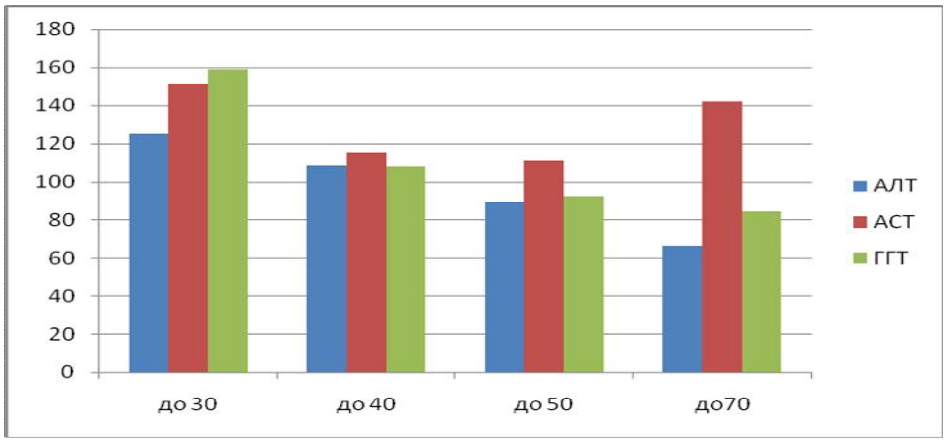
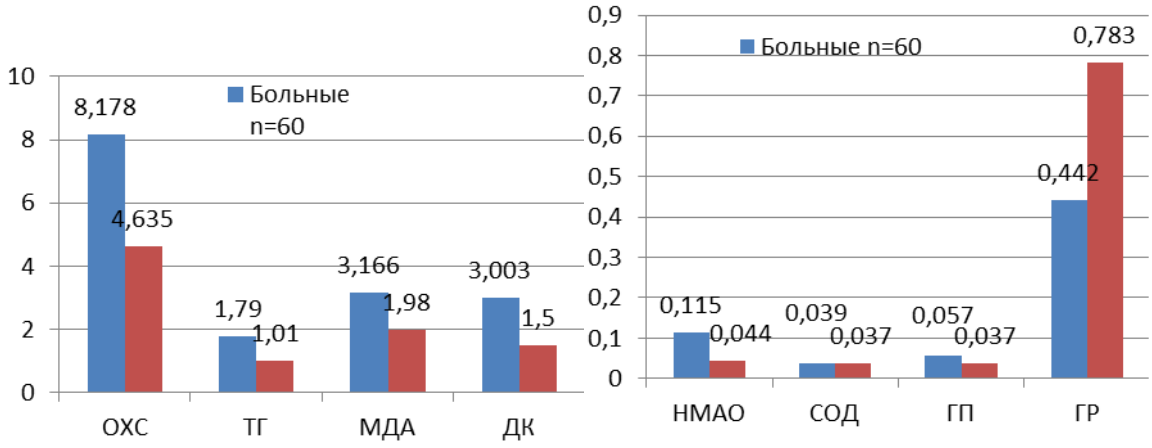


Fig.3 condition lipids and pro-and anti-oxidant system in patients



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Dynamic Characteristics of Nonspecific Adaptive Body Response of Patients with Mandibular Fractures at using «Epsorin»

ABSTRACT

Efficiency evaluation of «Epsorin» in complex treatment of mandibular fractures was conducted. The use of «Epsorin» revealed changes ofvalues of nonspecific adaptive response, which were connected with positive phase increasing and significantly reducing of phase «stress», which indicated its clinical efficacy.

Keywords: nonspecific adaptive response, osteosynthesis, stress reaction, leukocytosis, prevention of complications.

INTRODUCTION

Nowadays non-firearm damages of maxillofacial area have a tendency to increase, and that is one of the most actual problem of medicine [2, 6, 9, 10]. The fractures of mandible occupy a significant part in the structure of damages of the facial bones [4, 8]. According this, in the health care facilities of maxillofacial surgery a lot of attention is put on the improvement of complex treatment of traumatic lesions of the mandible [2, 6].

It should be noticed, that the fractures of mandible are accompanied by pain syndrome, destruction of a large amount of tissues, incoming of products of autolysis to the bloodstream, where the particular role play immune and nonspecific factors of resistance [1, 3, 5, 7]. The action of strong inadequate stimuli to the body leads to the depression ofthymico-lymphatic system and to the activity of the endocrine glands, while the secretion of ACTH and glucocorticoids, on the contrary, are increased. At the same time, the certain quantitative and qualitative changes of white blood are noticed, on the basis of which an assessment and an analysis of nonspecific adaptive response of the organism are made [3, 7, 10].

The aim. To make a comparative analysis ofnonspecific adaptive response changes in patients with mandibular fractures who take "Epsorin" on the basis of clinical and laboratory studies.

MATERIALS AND METHODS

A comprehensive clinical and laboratory examination of 129 patients with mandibular fractures between the ages of 18 and 40 is done,they were hospitalized in a Department of Maxillofacial and Plastic Surgery SBI Sakha (Yakutia) "Republican Hospital №2 - Center of emergency medical care." In this case, for a comparative analysis of the "Epsorin" 2 groupswere formed: the main group (n = 47 patients) and the control group (n = 82 patients). The immobilization of jaw by the tooth intermaxillary tires and extraoralintralesionalosteosynthesiswere done to all patients. The formed groups were representative according all the studied parameters.

"Epsorin" (an extract from the reindeer antlers) was developed in 1991-1992 by FBSIS "Institute of Biological Problems of the permafrost zone" of SD RAS (Yakutsk). "Epsorin" has a bio-stimulating and antioxidant effect to the body. It is a complex of biologically active substances, which comprises 0.6 g/l of protein, 0.2 g/l of phospholipids, 0.75 g/l of free amino acids, 2 g/l of esters of unsaturated fatty acids, 0.8 g/l macro- and microelements (Fe, Mg, Mn, Co, Zn, Cu, Ca, F, I), a balanced set of vitamins (100 mg/l of vitamin A, 1,0 mg/l of vitamin D, 230 mg/l of vitamin E, 10 mg/l of vitamin K, 3,3 mg/l of vitamins B group, 15 mg/l vitamin H, 30 mg/l

of folic acid, 1.35 mg/l of vitamin C etc.), 0.2 mg/l two and three-basic esters, organic acids (amber, citric, isocitric, oxaloacetic, malic), 5.0 mg/l of at least 8 fractions prostaglandins, 9 mg/l of biologically active derivatives of cholesterol (gluco-, mineralocorticosteroidsand sex hormones), and others. On the basis of its structure features and properties, we used "Epsorin" asan adaptogenic drug in treatment of mandibular fractures.

Assessment of nonspecific adaptive response (NAR) was carried out by I.M. Meltzer and co-writers (1997), L.H.Garkaviand co-writers (1998), it was based on the proximate analysis of blood leukocyte (counting was performed on 300 cells). Various phases of NAR are characterized by the following parameters: "sustained activation" - (lymphocytes)/(neutrocytosis) = from 0.5 up to 1.0 in a ratio (monocytes)/(eosinophils) = from 1.0 up to 6.0; "stable training" - (lymphocytes)/(neutrocytosis) = from 0.5 up to 0.3 in a ratio (monocytes)/(eosinophils) = from 1.0 up to 6.0; "stress" - (lymphocytes)/neutrocytosis) = from 0.3 or less at any ratio (monocytes)/(eosinophils); "intermittent activation" and "unstable training" - with a ratio (monocytes)/(eosinophils) = from 1.0 or below, up 6.0 or higher. Reaction of "stable activation" and "sustainable training" were considered as "positive", reaction of "unstable activation" and "unstable training" - as "transient", reaction of "stress" and "reactivation" - as negative. The study was performed on admission through the 2nd and 14th days after the operation.

Statistical analysis of the material was carried out by standard methods of variation statistics.

RESULTS AND DISCUSSION

Analysis and evaluation ofcomplete blood countresults characterizes the existence of certain features (table 1). ESR increased in the control and experimental group in two days after intralesionalosteosynthesis, and accounted for 23,75±0,79 mm/h and 22,28±1,08 mm/h (P>0,05). Wherein in group «Epsorin» was significantly determined reduction of thisindicator in 14 days after operation to 16,63±0,82 mm/h,whereas in control group rate was 19,38±0,72 mm/h (P<0,05). Decrease of hemoglobin and erythrocytes in posttraumatic period was revealed in all patients. This changes a certain way affect on activity adaptive systems of a body.

Results of nonspecific adaptive body response indicated presence of some clinical features (table 2). Phase "transition" (unstable reaction: "activation" and "training") in the main group (23,34±2,74%) was significantly higher than in control group in two days after operation, where figure was 8,45±2,07% (P<0,05). In maintime, the phase "stress" in the control group slightly decreased in comparative analysis (36,71±1,43%), whereas in the main group it greatly reduced – 25,64±2,65% (P<0,05).

More significant changes in indicators of adaptive systems of the body were observed in 14 days in thegroup with«Epsorin» then at the control. Phases "positive" (resistant reaction: "activation" and "training") of main group greater than 1,37 in group with standard treatment (P<0,05). More positive data had been identified in phase "stress"from a clinical point of view, where data of main group is 2,18 times lower compared to control (P<0,05).

Using «Epsorin» increased activity of adaptive systems of body and accompanied by absence of post-traumatic complications, whereas complications in control group were 6,69±3,05%. Our resultsshowed clinical efficacy of this adaptogen, and,in our opinion, this is due to action of vitamins A, E, C, K and B complex, free amino acids and fraction of prostaglandins,which are part of «Epsorin».

Conclusion. Using "Epsorin" in complex treatment of mandibular fractures revealed qualitative changes of nonspecific adaptive response. A significant increase of positive phase and reduction of phase "stress" in comparison of control group were noticed. The increase of activity of adaptive systems in postoperative period and clinical effective of "Epsorin" in jaw trauma treatment was revealed.

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Table 1

Dynamics of nonspecific adaptive response in patients of studied groups (M±s)

Periodofstudy	Phases of nonspecific adaptive response	Group, %	
		Control (n=82)	«Epsorin» (n=47)
Onadmission	"Positive" (sustained response: "activation" and "training")	20,42±1,80	21,13±2,29
	"Transition" (unstable reaction: "activation" and "training")	22,44±1,75	21,89±2,55
	«Reactivation»	2,43±2,21	2,12±3,49
	«Stress»	54,71±1,02	54,86±1,61
In 2 daysaftersurgery	"Positive" (sustained response: "activation" and "training")	49,98±1,13	46,78±1,90
	"Transition" (unstable reaction: "activation" and "training")	8,45±2,07	23,34±2,74*
	«Reactivation»	4,86±2,15	4,24±3,42
	«Stress»	36,71±1,43	25,64±2,65*
In 14 daysaftersurgery	"Positive" (sustained response: "activation" and "training")	61,55±0,87	84,41±0,55**
	"Transition" (unstable reaction: "activation" and "training")	20,64±1,79	2,12±3,49**
	«Reactivation»	2,43±2,21	6,42±3,34
	«Stress»	15,38±1,91	7,05±3,32**

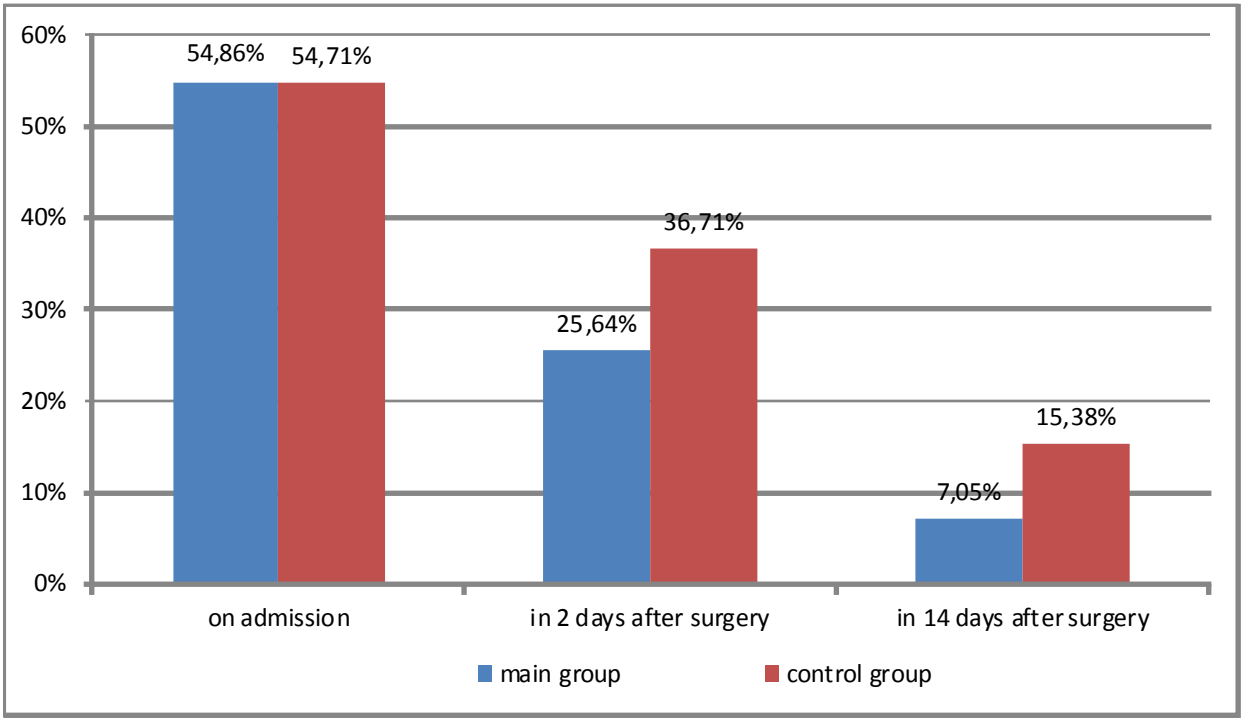
Note: * – significance of differences between two groups in 2 days after surgery; ** – significance of differences between two groups in 14 days after surgery. ($P < 0,05$).

Table 2

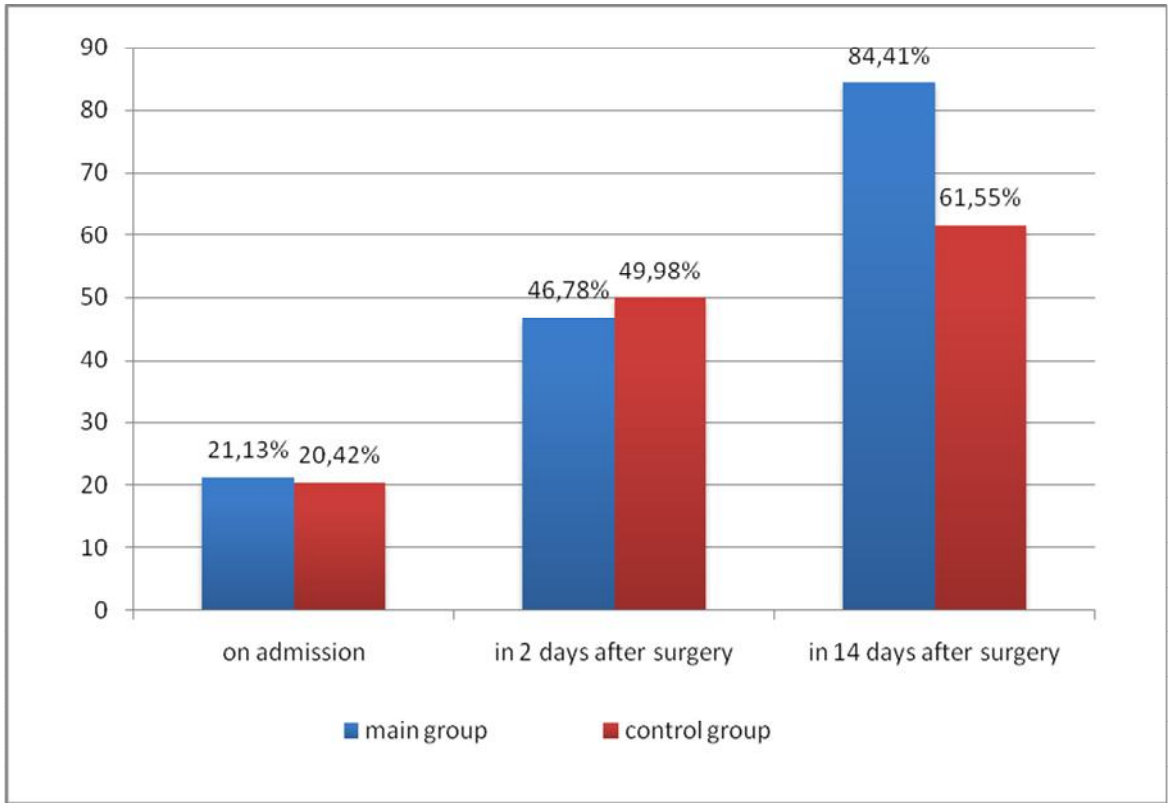
Dynamics of blood count indicators in patients of studied groups (M±s)

Indicator	Controlgroup (n=82)			Maingroup (n=47)		
	On admission	**In 2 daysaftersurgery**	**In 14 daysaftersurgery**	**On admission**	**In 2 daysaftersurgery**	**In 14 daysaftersurgery**
Erythrocytes,× 10^{12}/л	4,61±0,05	4,41±0,04	4,20±0,04	4,71±1,44	4,11±0,03*	4,56±0,05**
Hemoglobin, г/л	143,35±1,20	143,06±1,04	137,32±1,22	145,91±1,21	131,92±1,51*	147,82±1,47**
Leukocytes, × 10^{9}/л	10,45±0,36	9,25±0,15	6,38±0,06	12,14±0,44	8,28±0,31*	7,65±0,15**
Stab neutrophil, %	4,36±0,27	1,99±0,17	1,91±0,06	4,26±0,45	1,57±0,13*	1,10±0,09**
Neutrophils, %	69,21±0,63	64,42±0,77	57,31±0,65	69,82±1,37	62,42±0,85*	67,41±0,95**
Eosinophils, %	1,06±0,09	1,44±0,11	2,82±0,15	0,93±0,02	2,86±0,19*	3,64±0,19**
Lymphocytes, %	22,36±0,72	28,75±0,63	31,15±0,52	21,27±1,27	23,71±0,62*	20,27±0,91**
Monocytes, %	5,57±0,22	5,25±0,20	7,31±0,22	5,67±0,29	8,92±0,36*	7,09±0,36
ESR, mm/h	12,21±0,86	23,75±0,79	19,38±0,72	12,83±0,98	22,28±1,08	16,63±0,82**

Note: * – significance of differences between two groups in 2 days after surgery; ** – significance of differences between two groups in 14 days after surgery. ($P < 0,05$).



Picture 2. Dynamicof indicators phase "stress" in patients studied groups with mandibular fractures



Picture 2.Dynamic of indicators phases "positive response" in patients studied groups with mandibular fractures.