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The edition address:
677019, Yakutsk, Sergeljahsky highway, 4,
M&ChHCC NCM, unit S1-01,
tel.(4112) 32-15-26; 39-55-52
The telefax (4112) 32-19-81
E-mail: ysc_tech@sakha.ru
yscredactor@mail.ru
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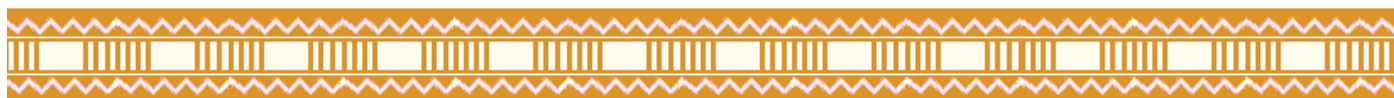
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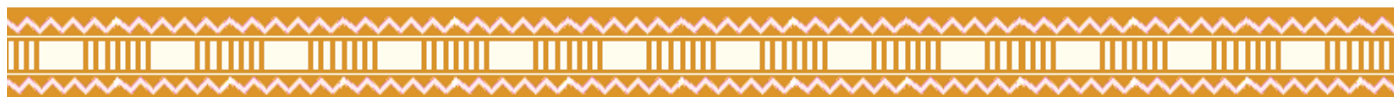
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The teacher of scientists (A.A. Bezrodnykh)

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The articles are presented in the author's translation



УДК 616-614.2(=1.571.56-81)

Social and hygienic aspects of health state of native small in numbers people of Republic Sakha (Yakutia)

UVAROVA T.E., BURTSEVA T.E.

PRIORITIES OF PATHOLOGICAL MORBIDITY STRUCTURE OF THE POPULATION IN PLACES OF COMPACT RESIDING OF NATIVE SMALL IN NUMBERS PEOPLE OF REPUBLIC SAKHA (YAKUTIA) ARE CURTAINED. AUTHENTICALLY SIGNIFICANT DISTINCTIONS IN PREVALENCE OF PATHOLOGY OF DIGESTIVE ORGANS, RESPIRATORY ORGANS AND OSTEO-MUSCULAR SYSTEM IN DOLGANS, EVENKS, AND EVENS ARE ESTABLISHED. THE REVEALED ETHNIC DISTINCTIONS SUBSTANTIALLY HAVE BEEN CAUSED BY SOCIALLY HYGIENIC CONDITIONS OF LIFE IN AREAS OF RESIDING OF NATIVE PEOPLE OF THE NORTH.

KEYWORDS: NATIVE SMALL IN NUMBERS PEOPLE, PATHOLOGICAL MORBIDITY

INTRODUCTION

Today low incidence of the social and economic status of people living on the Far North and on the rural territory is detected. The social problems, unemployment effect to health condition of the aboriginal people [1,2].

Research objective: examination of the health and life condition of native people living compactly.

Materials and methods

We examined 813 people, living in Gigansky, Ust-Maysky, Anabarsky regions of Yakutia. Age of patients from 17 to 86, middle age is $44,0 \pm 1,7$ years old. Women - 547 (67,3%), men – 266 (32,7%). 597 are native people (Evenks 324 (39,9), Evens – 43 (5,3), Dolgans – 230 (28,3%)). The health condition is examined by cardiologist, pulmonologist, neurologist, gastroenterologist, otolaryngologist, urologist, gynecologist, ultrasound-examination and endoscopy are done. We use International classification disease X. The level of the life condition is examined using special social questionnaire.

Results.

The first plays of the pathology profile is gastroenterology disease (67,9 cases of the 100; 26,0%), second plays – urinary disease (45,3; 17,3%), third - the hard disease (44,4; 17,0%), than respiratory disease and disease of the osteo-muscular system (tabl. 1).

IN EVENK POPULATION DISEASE OF THE GASTRO-INTESTINAL SYSTEM, RESPIRATORY SYSTEM, OSTEO-MUSCULAR SYSTEM IS HIGH (75,6, 46,3 И 36,1%), THAN IN DOLGAN POPULATION (57,4, 27,8 И 23,0%) AND EVEN POPULATION (60,5, 30,2 И 20,9%) ($P < 0,05$)(DIAGRAMM1).

THE PATHOLOGY PROFILE IS LOW IN ANABARSKY REGION THAN UST-MAYSKY AND GIGANSKY REGIONS (TABL. 2).

THE LEVEL OF THE LIFE CONDITION IS EXAMINATION USING SPECIAL SOCIAL QUESTIONNAIRE. THE QUESTIONNAIRE IS CONSISTING OF THE QUESTION ABOUT EDUCATION, SOCIAL STATUS, AND FAMILY STATUS. WE ARE QUESTIONNAIRE 447 PEOPLES, 155-DOLGAN, 292-EVENK POPULATION.

THE MEDIUM SQUARE OF THE HOUSE IS 13,9 M² TO DOLGAN, 18,7 M² TO EVENK. THE CENTRAL HEATING HAVE 95,5% DOLGAN, 34,9% EVENK. THE HOUSES WAS BUILDING AFTER 1995 OF THE 45,8% DOLGAN, 28,1% EVENK. THE PEOPLE WITH BAD HOUSES AND LIFE CONDITION ARE HIGH OF THE EVENK POPULATION THAN ON THE DOLGAN POPULATION (40,1 AND 21,3%). THE CAUSE OF THE BAD LIFE CONDITION IS DETECTED DEFICIENCY OF THE SQUARE OF HOUSE (54,5%), ABSENTS HEATING (78%) AND OLD OF THE HOUSE(69,2%).

THE FINANCIAL STATUS IS LOW IN THE EVENK POPULATION THAN IN THE DOLGAN POPULATION (40,4% -31,0%). BUT THE 12% OF THE EVENKS AND 6,5% OF THE DOLGAN PEOPLE ANSWERED THAT THE MEANS THEY HAD DID NOT SUFFICE EVEN ON A FOOD. THE MEDIUM INCOME LEVEL FOR 1 PERSON IS 5675 RUBLES IN THE EVENKS, 8372 RUBLES IN THE DOLGANS.

THE LIFE CONDITION AND FINANCIAL STATUS IS LOW IN THE EVENK PEOPLE THAN IN THE DOLGANS.

CONCLUSION

1. Illnesses of digestive organs, urinogenital system and system of blood circulation (67,9, 45,3, 44.4 on 100 of population accordingly) prevail among the population of the native small in numbers people.
2. Illnesses of digestive organs, respiratory and osteo-muscular system have been positioned much more often in the Evenks (75,6, 46,3 and 36,1 %), than in the Dolgans (57,4, 27,8 and 23,0 %) and Evens (60,5, 30,2 and 20,9 % accordingly) ($P < 0,05$).
3. The health state of the population of the native small in numbers people was substantially defined by living conditions and level of financial status.

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TABLE 1

THE PATHOLOGY PROFILE OF THE EXAMINATION POPULATION

DISEASE (IMC – 10)	LEVEL	TO 100 PEOPLE	%
A00-B99 infection disease	VIII	4,4	1,7
C00-D48 oncology	X	2,8	1,1
E00-E90 endocrinology disease	VII	8,7	3,3
F00-F99 psychiatry disease	XIII	0,6	0,2
G00-G99 nerve system disease	VI	15,0	5,7
H60-H95 otorinolaringology disease	IX	3,0	1,1
I00-I99 hard disease	III	44,4	17,0
J00-J99 respiratory system disease	IV	36,9	14,1
K00-K93 gastrointestinal system disease	I	67,9	26,0
M00-M99 osteo-muscular disease	V	28,4	11,0
N00-N99 urinary disease	II	45,3	17,3
Q00-Q99 hereditary disease	XI	2,6	1,0
S00-T98 trauma	XII	1,2	0,5
All of them		261,2	100,0

TABLE 2

THE PATHOLOGY PROFILE OF THE EXAMINATION POPULATION TO REGIONS

DISEASE (IMC – 10)	region					
	Ust-Maysky		Gigansky		Anabarsky	
	NUMBER	%	NUMBER	%	NUMBER	%
I00-I99 HARD DISEASE	103	55,4	97	51,3	161	36,8
J00-J99 RESPIRATORY SYSTEM DISEASE	75	40,3	96	50,8	129	29,5
K00-K93 GASTROINTESTINAL SYSTEM DISEASE	139	74,7	148	78,3	265	60,1

M00-M99 OSTEO-MUSCULAR SYSTEM DISEASE	77	41,4	55	29,1	99	22,6
N00-N99 URINARY DISEASE	79	42,5	109	57,7	180	41,1

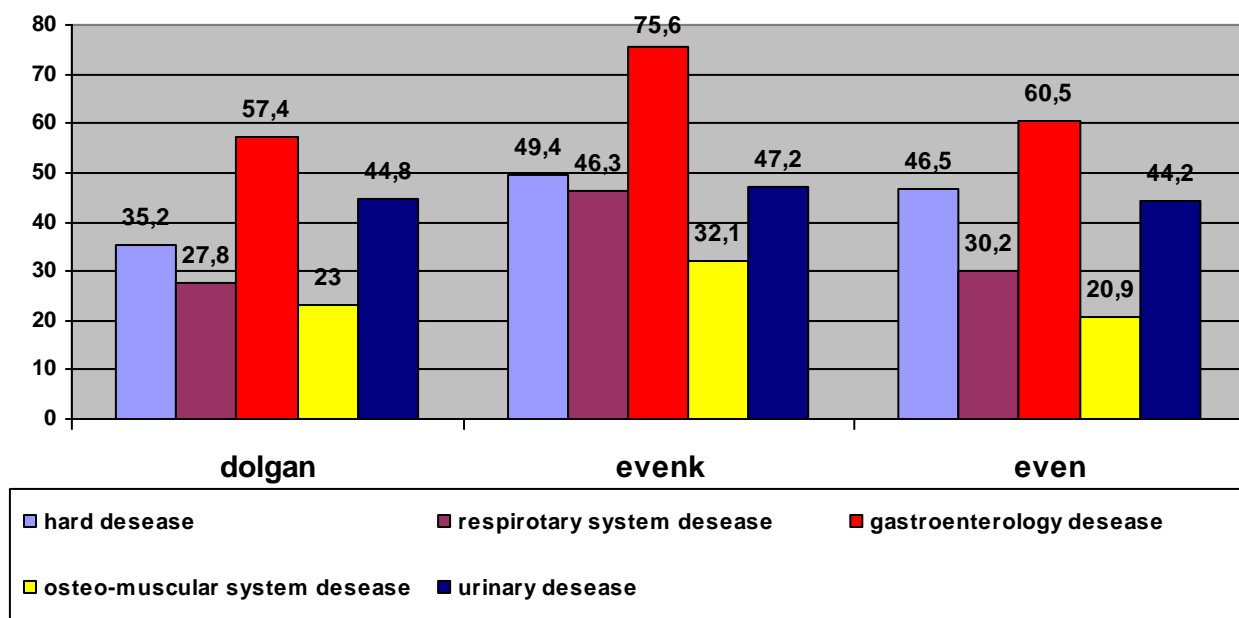


DIAGRAM 1

PATHOLOGY STRUCTURE FOR NATIVE PEOPLE

N.B.Semenova, T.F.Martynova

THE PREVALENCE OF EMOTIONAL AND BEHAVIOR DISORDERS IN CHILDREN IN THE NORTH OF SAKHA REPUBLIC (YAKUTIA)

The prevalence of emotional and behavior disturbances in children, living in the North of Sakha Republic (Yakutia), is presented. We characterized a group of schoolchildren with neural psychic disorders. We marked that schoolchildren of early ages showed disturbances in the processes of adaptation to school, reflected in poor school performance, regular absence from

school, no respect from classmates. In adolescents complex of the problems and school disadaptation signs are growing.

Key words: children, emotional and behavior disorders, prevalence.

Emotional and behavior disturbances in children are serious problem due to disorders in adaptation to organized group as well as future difficulties in socialization in adult life. We studied disorders of inner and outer behavior, which can be divided into three groups: disorders, which show internal problems of a child (anxiety, discomfort, shyness, aloofness, timidity); disorders, which lead to external problems (violence, aggression, disobedience, tantrums, lie, theft) and disorders, which provoke both internal and external problems.

Main criteria for defining disorders in internal and external behavior as signs of psychic pathology are: polymorphism of clinical signs, combination of behavior disorders with neurotic disturbances and dynamics of aberrant behavior with the tendency to pathologic transformation in a person [1].

Emotional and behavior disturbances cause disorders in adaptation of a child to schooling and exacerbation of learning abilities [8]. Behavior disturbances in children can lead to serious influences upon their adult lives: social adaptation difficulties, asocial behavior, predisposition to crime and alcoholism [4, 10, 11]. In terms of further social adaptation especially unfavorable are combinatory forms of disorders: combination of behavior and emotional disturbances, with depression in particular. According to the opinion of many foreign researchers, combinatory forms of pathology in children is a high risk factor of suicidal, asocial behavior, crime, alcohol and drug addiction in adult ages [12, 13].

Within the last 25 years foreign psychiatrists marked growth of behavior disturbances in children and adolescents among both males and females of all the social and family types [3]. The same situation is being observed in Russia as well.

Aim of the present research is to study the prevalence of emotional and behavior disturbances in children of Extreme North, inhabitants of Sakha Republic (Yakutia) (**SR(Y)**). To study the prevalence of neural-psychic diseases is essential for morbidity analysis and programming psychic health servicing for children.

Materials and Methods.

We examined 888 children and adolescents, schoolchildren of 1st – 9th forms of secondary schools (in ages from 7 to 16 years) by bulk selection, all of them being the inhabitants of northern district Ust-Yanskiy of SR(Y): villages of Deputatskiy, Kazachye, Sayulyk, Ust-Yansk,

Ust-Kuyga. Comparative characteristics for emotional (ED) and behavior (BD) disorders prevalence was worked out for two age groups: early school age (from 7 to 11 years) and among adolescents (from 12 to 16 years).

To carry out the research we used adapted Russian version of M. Rutter questionnaire (Rutter, Tizard & Whitmore, 1970). In accordance with international requirements to epidemiology research in the sphere of psychiatry (Goodman R., Scott S., 1997) the study was structured into two stages. First stage included screening test (scale B – for teachers). Second stage included psychiatric examination for all “screen-positive” subjects and diagnosis for 20% subjects picked up by random. The procedure of diagnosis went in conformity with International statistical classification for diseases of X revision (MKB-10).

For processing statistical data we used STATISTICA for Window Version VI. Statistical analysis of binary signs was evaluated by relative frequency calculation (%) and 95% confidence interval (95% CI). Comparison between groups in accordance with binary attribute was carried out with χ^2 and Fischer’s exact criterion. The value of distinction significance level was accepted under $p=0.05$, that is within an error of 5% (Rebrova O.Y., 2003).

Results and Discussions.

In children of early school ages the prevalence of emotional and behavior disturbances amount 14.2%. The share of emotional disorders (ED) was 1.6%, behavior disorders (BD) 11.9%, combined disorders 0.7% (Table 1). In adolescents the growth of the prevalence of psychic disturbances took place (21.4%) due to the growth of both ED (3.1%) and BD (16.5%) and also combined disorders (1.8%).

While comparing the indices for SR(Y) with the same indices for the other countries, we revealed they exceeded. Index for China was 8.6%, Great Britain 9.5% [6], Japan 14 to 16% [9], Scandinavia countries 14.3% [7], United Arab Emirates 11.8% [5].

Similar research in our country showed the indices of ED and BD prevalence in students of secondary schools of Novosibirsk as 15.3% [6]. In Tyva Republic indices of prevalence of the disturbances were from 15.3 to 19.4% in rural and from 28.2% to 30.7% in urban schoolchildren [2].

Analysis of psychic disorders in SR(Y) in terms of gender showed their predominance in boys (Table 2). In boys of early schoolchildren disorders were met 3.6 times more often than in girls (21.2% and 5.8% correspondingly, $p<0.001$) and in adolescents in 2.8 times more often (30.5% and 10.9% correspondingly $p<0.001$). Statistically meaningful distinctions were met only in regard to behavior deviations: in early school age behavior deviations in boys were 18.8% and in girls 3.5% ($p<0.001$), in adolescents 25.4% and 6.4% correspondingly ($p<0.001$). As for ED,

they were met with equal frequency both in boys (in early school ages in 1.4%, and in adolescent 3.7%) and in girls (in early school ages in 1.7%, and in adolescent 2.5%), $p>0.05$.

Among psychic disorders in early school ages the most frequent were BD (11.9%) and hyperkinetic disorders (6.6%). Anxiety disorders ranked third (3.9%). We marked the same structure of disorders in adolescents: BD were found in 16.5% children, hyperkinetic disorders in 6.3%, anxiety disorders in 4.9% children (Table 3).

Characteristics of children with border-line neural psychic disorders.

We examined group of children with disturbances of psychic health in early school ages totaling 54 subjects (14.2%). There were 22 children out of the group (40.7%) with single diagnosis, 32 (59.3%) with a combination of two or more diagnoses. The most prevalent type of comorbidity was a combination of hyperkinetic (F90) and behavior (F91) disorders. This comorbidity type was marked in 33.3% children. Among other comorbid disorders there were found combinations of anxiety (F93.8) and depressive (F32) disorders (in 5.6% children). In 5.6% children we found combination of hyperkinetic (F90), behavior (F91) and anxiety-depressive disorders.

Even in early school ages there were signs of school adaptation disturbances in children with neural psychic disorders. 18 subjects out of 54 (33.3%) regularly faked off school. 25 children (46.3%) were in disfavor of other children and were rejected by them. We marked lie in 32 children (59.3%) and predisposition to theft in 8 subjects (14.8%). School performance in children with psychic disorders was lower than in the others. 15 children (27.8%) had grades higher than 3. At the same time 36 children (66.7%) showed poor performance, 3 children (5.6%) didn't cope with school program.

Group of adolescents with neural psychic disorders amounted to 109 subjects (21.4%). In 74 out of them (67.9%) one disease was diagnosed, in 35 subjects (32.1%) the combination of two or three diseases was diagnosed. Among comorbid disorders the combinations of hyperkinetic and behavior disorders were more frequent (in 26.6% children). Combinations of depressive and behavior disorders were marked in 3 children (2.8%).

In adolescents with psychic disorders school adaptation disturbances were marked more frequently than in children in early school ages. 67 subjects out of 109 (61.5%) regularly faked off school. We marked lie in 80 children (73.4%). 46 children (42.2%) were in disfavor of other children and were rejected by them. School performance in the said group of children was low as well: 8 adolescents (7.3%) had grades higher than 3; 91 adolescents (83.5%) showed poor performance; 10 adolescents (9.2%) didn't cope with school program.

Conclusion.

So, the prevalence of emotional and behavior disorders in children, living in the north of SR(Y) in early school ages approached 14.2%, in adolescence 21.4%. In boys psychic disorders were marked 2.8 – 3.6 times more frequent than in girls.

In terms of frequency behavior disorders (F91) ranked first, hyperkinetic (F90) ranked second and anxiety (F93.8) ranked third among psychic disorders.

Children with emotional and behavior disorders in early school ages showed adaptation disturbances to children organized group, which were reflected in poor school performance, regular absence from school, no respect from classmates. While growing into adolescents, signs of social disadaptation in children are growing.

As preventive measures against the complex of disadaptive states and difficulties in further socialization in adults it is necessary to timely diagnosis neural psychic disorders and provide medical psychological assistance to the said kind of schoolchildren.

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Table 1

Prevalence of ED and BD in children, living in northern SR(Y).

Age	Schoolchildren of early ages (n=379)		Adolescents (n=509)	
Disturbances	Abs.	% (CI)	Abc.	% (CI)
Total:	54	14.2 (11.1-18.1)	109	21.4 (18.1-25.2)
ED	6	16.3 (0.7-3.4)	16	3.1 (1.9-5.0)
BD	45	11.9 (09.0-15.5)	84	16.5 (13.5-19.9)
Combined disorders:	3	0.7 (0.2-2.2)	9	1.8 (0.9-3.3)

Table 2

ED and BD in children of different gender.

Age	Schoolchildren of early ages (n=379)				Adolescents (n=509)				p ₁₋₂ p ₃₋₄
Gender	1. Boys (n=207)		2. Girls (n=172)		3. Boys (n=272)		4. Girls (n=237)		
Disturbances	Abc.	%	Abc.	%	Abc.	%	Abc.	%	
Total:	44	21.2	10	5.8	83	30.5	26	10.9	<0.001
ED	3	1.4	3	1.7	10	3.7	6	2.5	>0.05
BD	39	18.8	6	3.5	69	25.4	15	6.4	<0.001
Combined	2	0.9	1	0.6	4	1.5	5	2.1	>0.05

Table 3

Prevalence of psychic disorders in children, living in northern SR(Y).

Disorders	Schoolchildren of early ages (n=379)		Adolescents (n=509)	
	Abs.	% (95% CI)	Abc.	% (95% CI)

F90 (hyperkynetic)	25	6.6 (4.5-9.5)	32	6.3 (4.5-8.7)
F91 (behavior)	45	11.9 (0.9-15.5)	84	16.5 (13.5-19.9)
F93.8 (anxiety)	15	3.9 (2.4-6.4)	25	4.9 (3.3-7.1)
F32 (depression)	9	2.4 (0.1-4.4)	15	2.9 (0.2-4.8)
F95 (tics/spasms)	6	1.6 (0.7-3.4)	18	3.5 (0.2-5.5)
F98.5 (logospasms)	12	3.2 (0.2-5.4)	13	2.6 (0.2-4.3)
F98.8 (others, further detailed)	8	2.1 (0.1-4.1)	14	2.7 (0.2-4.6)
Totally disorders *	54	14.2 (11.1-18.1)	109	21.4 (18.1-25.2)
* - the figure is smaller than the total of all different diagnosis because of comorbidity				

AUTHORS' DETAILS.

Mrs. SEMENOVA Nadezhda Borisovna – Leading Scientific Worker in the Department for somatic and psychic health in children. SSRI of Northern Problems of SD RAMS. Professor

Home address: Russia, 660095, Krasnoyarsk, ul.Kommunalnaya, d.18, kv. 62.

Mobile phone: 7-913-53-98-602,

Office phone: 7 (391) 228-06-83,

E-mail: org@impn.ru

Mrs. MARTYNOVA Tatiana Fedotovna – Deputy Director for Teaching and Methodical Work, SEE «RC of psychological medical social care» ME SR (Y)

Home address: Russia, 677013, Yakutsk, ul. Kalandarishvili d.21/2, kv. 64

Mobile phone: 7-914-107-0847,

Office phone: 7 (4112) 42-28-92,

E-mail: rubicon_2002@impn.ru

MOLECULAR INTERACTIONS OF FAT-SOLUBLE VITAMINS (RETINOL AND ALPHA-TOCOPHEROL) WITH THE PARAMETERS OF THE FUNCTIONAL CONDITION OF THE ERYTHROCYTIC MEMBRANES IN EVENKIA CHILDREN

T.A. Kolodyazhnaya, O.I. Zaitseva, V.T. Manchuk, G.N. Kazakova

SRI of the medical problems of the North SD RAMS, Krasnoyarsk city

Director – member-correspondent of RAMS V.T. Manchuk

Krasnoyarsk State Medical University named after prof. V.F. Voino-Yasenetsky

Rector and Professor Ivan P. Artyukhov

Resume. In healthy children of the indigenous (18) and newcomers Evenkia from 1 to 3 years studied the structural and functional properties of erythrocyte membranes with defined lipid profile, levels of fat-soluble vitamins (retinol and alpha-tocopherol). Established physical and chemical properties of erythrocyte membranes: performance mobility of molecules in the surface and in the hydrocarbon regions, the level of structured water and the degree optical lability. The method of pair correlation relationships found that fat-soluble vitamins (retinol and alpha-tocopherol) are often ambiguous functional properties with respect to the molecular structure of erythrocyte membranes in children of different ethnicity.

Key words: Evenkia, children, erythrocytic membranes, liposoluble vitamins.

Introduction. Adverse environmental conditions of the North Asian promote considerable growth of various deviations in the health status of children of non-indigenous population to 3 years [5], which may affect the structural and functional properties of their membranes, primary adaptive changes [1]. In these extreme conditions of high role of lipid metabolism, energy supply to the body of the child is particularly important fat-soluble vitamins (retinol and tocopherol) [7]. They are an integral part of the antioxidant system of non-enzymatic nature. From them depends largely on the structural integrity of biomembranes and their functional activity. [2,10]. As the structural components of biomembranes, retinol, and tocopherols functionally complement each other and are closely connected. And she is so strong that vitamin A in the absence of tocopherol oxidized and quickly destroyed. It is known that

retinol in biological membranes is associated with localized surface phospholipids and protein-lipid complex. Accordingly, they influence their metabolism [10].

Tocopherols are localized in the hydrophobic regions of phospholipids, supporting the necessary density of their packing, limiting the access of oxygen to the acyl chains. It should be emphasized that the above mentioned functions tocopherol is able to perform only in the biologically active state. This condition is ensured by the presence of ascorbic acid in the system, which supports its steady-state level, preventing the formation of toxic tokoferilhinona. [10].

Real metabolic manifestations of fat-soluble vitamins (tocopherol and retinol) in the structure of biomembranes is impossible to determine without taking into account the state of their structure and function. The study of lipid structure of erythrocyte membranes and their biophysical properties, including the determination of levels of intramembrane-soluble vitamins (alpha-tocopherol and retinol) and membrane-structured water, will reveal their antioxidant or prooxidant properties. The absence of such studies have identified the relevance of the study of the problem. Universal model for studying the state of cell membranes is the erythrocyte [6].

Objective: to study the molecular interaction of retinol and alpha-tocopherol with the parameters of lipid metabolism and physical-chemical state of erythrocyte membranes in children from 1 year to 3 years of different ethnic origin living in the Evenkia.

Materials and methods. Were examined by healthy children of the indigenous (18) and newcomers (18 people) aged 1 to 3 years old, living in the village of Tura Evenkia). Were examined 36 healthy children. The study was conducted based on the kindergarten of the village.

In the erythrocyte membranes were determined: lipid profile by thin layer chromatography [9], the level of fat-soluble vitamins, alpha-tocopherol and retinol-fluorimetric method [11], physical-chemical properties by measuring the fluorescence spectra of interaction of biomembranes with probes [3]. These measurements were made on the spectrofluorimeter MPF-4 firm, Hitachi (Japan) in a quartz ultramikrokyuvete 0,1 X 0,1 cm with a slit width of excitation and emission 8 nm.

Investigated the following parameters of physical and chemical state of erythrocyte membranes: the degree of fluorescence associated with the superficial layer of the membranes of negatively charged probe ANS (1-anilino-naftalin-8 - sulfonate) [3], characterizing the total charge of the surface layer of erythrocyte membranes; indicators reflecting microviscous properties of erythrocyte membranes deep (fluidity of the hydrophobic layer of erythrocyte membranes in relation excimers / pyrene monomers) and surface (motility area of protein-lipid interactions by reciprocal anisotropy of the probe 1-anilino-naphthalene sulfonate-8) layers of erythrocyte membranes. Along with that assessed the degree of optical lability [12] and the

asymmetry of fluidity of erythrocyte membranes. Using the fluorescent probe 4-demitilaminohalkona (DMC) found the degree of hydration of the erythrocyte membrane [3] according to the reciprocal of the fluorescence of the probe.

Mathematical processing of the results was performed using a standard package of statistical programs STATISTICS ver.6.0 [8]. To ensure the unity of the methodology used nonparametric methods. The significance of differences between groups when comparing two independent sample set using the nonparametric Mann-Whitney test (M-B). Results of the study of quantitative parameters in the comparison groups are presented in the form of Me-Media, 25% - 75% - percentile. The changes considered statistically significant at a significance level of $P < 0,05$. The analysis of dependence symptoms was performed by calculating and assessing the significance of the nonparametric Spearman's Rank Correlation.

Results and discussion. The research results presented in table number 1, showed that the content of alpha-tocopherol, the children of this age group, significant ethnic differences were found, while the concentration of retinol in children Evenkia was lower compared with those newcomers to 26,5% ($n = 0,0088$). However, indicators of lipid and phospholipids in the structure of erythrocyte membranes were not marked ethnic differences, except for a slight increase of free fatty acids (FFA) in the group of Evenkia children ($P = 0,0818$) and statistically significant increase (12,3%) degree of order in the hydrophobic area of the phospholipid molecules (reduced flow index) of the erythrocyte membranes ($p = 0,0465$). This has contributed to changes in the molecular relationship of surface and inner layers of erythrocyte membranes in children Evenkia. They found an increase in the exponent of the asymmetry of flow of surface and deep layers of erythrocyte membranes by 22, 7% ($p=0,0209$) compared with children of newcomers. Such a state of plasma membranes of red blood cells show a more pronounced conformational processes in the surface lipid layer of the white-plasmolemma erythrocytes in relation to the hydrophobic layer of phospholipids. Data transformation, in our opinion, are connected with vitamin A, which promotes the formation of positive charges on the protein-lipid surface of red blood cell membranes. This is evidenced by a moderate positive correlation relationship between retinol and an exponent of binding a negatively charged probe ANS ($r = 0,506$, $p = 0,0455$). This probe, negatively charged has the ability to bind to positively charged molecules only in the surface region of biomembranes and reflects the quantitative content of positively charged molecules.

Along with this have retinol in erythrocyte membranes of children Evenkia found antioxidant function. This is evidenced by a moderate direct correlation between the above mentioned vitamin with general quantity of phospholipids ($r = 0,496$ $p = 0,0598$). The fact that

retinol exhibit antioxidant properties with respect to phospholipids, proves not only the biological activity of metabolites of retinol, and alpha-tocopherol, which contributes to their conservation, while in the biologically active (reduced) [10]. Direct correlation between vitamin E with an exponent of fluidity of hydrocarbon layer of phospholipids ($r = 0,552$, $p = 0,0267$).

In children, the alien population Evenkia correlations of fat-soluble vitamins with indicators of functional properties of erythrocyte membranes showed a completely different metabolic manifestations of these vitamins. They have virtually no links pointing to the antioxidant function of the studied vitamins. However, sufficiently established a strong positive correlation levels of membrane alpha-tocopherol with the index of the optical lability ($p = 0,712$, $p = 0,0020$). The indicator shows the ratio of degrees of polarization and depolarization background biomembranes [12]. Correlation between in this case may reflect the influence of vitamin "E" to shift the balance of capacities and, therefore, to work acetylcholine receptors, which are simultaneously and ion channels that regulate membrane permeability to sodium and potassium ions [2]. In this context, traced a direct correlation between the optical index of lability to the level of membrane-structured water (the reciprocal of the fluorescence of DMAC) ($p = 0,508$; $p = 0,0314$). It is known that the transport of ions are dissolved in water status [2].

Conclusion. Using for food by the children from an early age of animal products contain high levels of fat-soluble vitamins, retinol, and tocopherols, has developed adaptive devices, particularly in relation retinol. It is known that this vitamin in its liposoluble form, being of highly compound, with even mild imbalance in the antioxidant system can become prooxidants [10]. Therefore, we obtained a significant reduction in the level of retinol in the structure of erythrocyte membranes is regarded as an adaptive activation of cellular metabolism that entails increased consumption of the vitamin in children Evenkia.

Identified antioxidant properties of vitamin "A" and "E" in the structure of erythrocyte membranes show that these vitamins and their metabolites in children Evenkia are biologically active. It is sufficient to maintain the antioxidant system in red blood cells.

In children, the alien population increased level of retinol in the structure of plasmolemma erythrocytes does not ensure its sufficient biological activity. In the alpha-tocopherol in the absence of express antioxidant characteristics in relation to membrane phospholipids and retinol found a link, proving its preserving function with respect to integral proteins, providing potassium sodium exchange. Lack of warning signs, reflecting the antioxidant function of fat-soluble vitamins in children alien population, shows no balance not only the above mentioned vitamins (retinol and tocopherol), but also protein, fat and other related components to ensure the metabolic conversion of these vitamins, so they get new

hydrophilic properties [4]. In our opinion, this can be achieved only at the use of natural, adapted to the conditions of the North with food or dietary supplement is as close to the food (fish oil northern species of fish, seaweed, etc.).

Thus, the study of the relationship of fat-soluble vitamins (retinol and alpha-tocopherol), erythrocyte membranes and their lipid structure and physical-chemical characteristics increase information availability and the physiological significance of these vitamins, child's body. The effectiveness of the processes of functioning plasmolemma erythrocytes caused not so much of these vitamins in the structure of membranes, as their quality characteristics, it means, biological activity, as determined by complex relationships that form the physiological level of optimal organization of the maintenance of prooxidant-antioxidant balance of the organism of the child.

Table 1.

The indexes of the content of retinol, alpha-tocopherol and biochemical and physical-chemical parameters in healthy children of the population of Evenkia (Me 25%-75%)

Analyzed indexes	Ethnical belonging		The degree of the reliability of the differences
	Evenks n = 18	Russian n=18	
Retinol, mcmmole/l	0,4300 (0,4000-0,5400)	0,5849 (0,4900-0,6900)	p = 0,0087
Apha- tocopherol, mcmmole/l	7,1300 (5,8400- 9,8000)	8,4250 (5,7550- 10,010)	————
Available fatty acids (AFA), mcmmole/l	0,832 (0,493-1,115)	0,582 (0,427-0,897)	p = 0,0818
Fluidity of the deep layer of the membranes, rel. unit	0,371 (0,318-0,390)	0,423 (0,359-0,488)	p= 0,0465

Mobility of the superficial layer (1/anisotr), rel.unit	2,375 (2,130-2,488)	2,220 (2,045-2,421)	_____
The degree of the skewness of the fluidity, rel.unit	6,444 (5,943-7,030)	4, 980 (4,115-6,338)	p=0,0209
Fluorescence, rel.unit	30,850 (29000-33,850)	32,000 (30,600-34,300)	_____
The level of the structured water (498) rel.unit	0,020 (0,018-0,023)	0,0214 (0,019-0,024)	_____
Optical liability (p/dp), rel.unit	7,190 (6,545-7,475)	7,060 (6,460-7,410)	_____

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Pregnancy and prenatal outcomes of juvenile mothers of Yakutsk

Grigorieva N.A., Savvina N.V.

North-East federal university named after M.K. Ammosov

Introduction

The period from 10 to 20 years old (in some countries to 24 years old) was recommended by international experts to be considered as “teenage” in Geneva in 1987. Teenage pregnancy is said to occur when a women aged between eleven and nineteen period. Pregnancy at teenage period was and continues to be the problem of public health care [1].

There is now the common opinion in literature about prevalence complication pregnancy and its outcome in young age. The majority of scientists think that young mothers have more complication than old ones [1, 3, 4, 5, 6, 7]. But some authors notice that there are no statistical significant differences to perinatal complications between young mothers and old ones [8, 9, 10].

During last years in our country the growth of somatic and gynecological morbidity of teenage girls is being marked. Deceases, that took place in child and teenage do not pass without consequences and afterwards complicate pregnancy and childbirth, exert bad influence on the

newborn's health. The duration of pregnancy, the result of childbirth and the state of a newborn are depend on a girl's belonging to a certain age group. The younger is the girl – the more is the danger. Practically every 2-3 teenage mother has extra genital pathology that complicates the duration of pregnancy [4]. Premature childbirth more often happens among teenagers, than older women, also more often anemia and preeclampsia are take place [5].

The fact, that many of teenage mother physiologically and psychologically are not ready to bear a child is accompanied by high number of pregnancy and childbirth complications, birth of premature, sick and traumatized newborns [4]. . The newborns mortality is higher among teenage mothers [2].

Alcohol abusing, smoking ant taking drugs make sense on pregnancy and childbirth. Teenage mother more often have bad habits (every 2-3 teenage mother). Newborns, who's mothers were smoking during pregnancy period have lower weight than those of non-smoking mothers [2].

In that way, teenager girl's pregnancy for today continues to be important medical and social problem. Since nowadays the reproductive health of teenagers, features of course and childbirths in different regions of Russia was not studied well, in Yakutsk such studies didn't take place before.

The aim of the study to compare pregnancy outcomes of the teenagers and the control, and to estimate a health condition of children born by them in early neonatal period.

Patients and Methods

The research work was made on the base of 1 and 2 obstetric departments of Yakutsk city clinic hospital. Complex researches took place from 2006 to 2009. The basic group was formed from 894 teenager mothers (younger than 19 years old) and their newborns. The group under control was formed from 714 women of optimum child-bearing age (20-34 years old).

STATISTICA version 6.1 was used for statistical analysis. Student's t-test was used for continuous variables, Chi square, Fishers exact test was used for categorical variables. The significance level adopted was 0.05.

Results

According to 1 and 2 obstetric departments of Yakutsk city clinic hospital figures, the share of teenager mothers has made 4,8-5,4 % from the general number of all childbirths and there is no tendency for lowering. The age of basic group was within 12 to 18 years old inclusive, average $17,4 \pm 0,02$ age. The age of basic group was $25,7 \pm 0,1$.

From 894 studied women there are Yakut teenager mothers – 414 (46,3%), Russian – 400 (44,7%), Even – 13 (1,4%), Evenk – 13 (1,4%), others – 54 (6,2%).

In the basic group prevailed women with first pregnancy - 770 (86 %). At the same time there were cases of second and third-pregnancy - 124 (14 %). First childbirth women were – 841 (94%), repeated childbirth women – 53 (6%).

Among the control group 272 (38%) were women with first pregnancy, 442 (62%) with repeated pregnancy, 391 (55%) – first childbirth, 323 (45%) – repeated childbirth.

The results of research work show that 9 % girls no attended prenatal consultations. However, adolescents attended in prenatal consultations, every 7 adolescent had poor prenatal care.

Many teenage mothers have bad habits: the majority of them were smoking before pregnancy – 170 (19%), elder women were smoking in 70 (9,8%) of cases.

The results of research work show that the majority of studied women of different ages have any kind of chronic somatic pathology. The structure of somatic pathology of teenage mothers and elder mothers is of the same kind. On the first place in the basic group – increasing of thyroid gland 232 (26 %, $\chi^2= 21,5$ $p=0,00000$), on the second - chronic pyelonephritis 195 (22 %, $\chi^2= 0,4$, $p<0,5$), diseases of cardiovascular system take the third place - 111 (12,5%, $\chi^2= 27,3$, $p= 0,000001$).

In the control group on the first place there are also thyroid gland diseases – 252 (35,4%), on the second – cardiovascular diseases – 164 (33%), then comes chronic pyelonephritis- 226 (31,6%), myopia – 167 (23,3%). Teenage mothers more often have narrow pelvis –190 (19% vs. 5%). This was statistically significant ($\chi^2= 73,4$, $p=0,00000$).

The majority of studied women, independently of an age, during pregnancy have one or another kind of genital pathology. Among gynecologic diseases the big relative density was made with infectious inflammatory processes with primary localization in a vagina and cervical channel, the share of venereal diseases in the basic group is higher than in the control group. Frequency of laboratory confirmed ureaplasmosis in group of teenage pregnant women makes 144 (16,1 %), a chlamydiosis-109 (12 %) ,a mycoplasmosis 104 (11,6 %), in the control group 7,7%, 7,7% and 5,6 % accordingly, These differences were statistically significant ($p<0,000001$). In the basic group before or during pregnancy 11 peoples were down with syphilis, trichomoniasis - 11, trichomoniatic colpitis 13, sharp-ended condiloms 17, contact with tuberculosis – 10.

The most frequent complications during pregnancy were anemia's 376 (42 %) in the basic group, 443 (62%, $p<0,000001$) in the control group, pregnancy induced hypertension (21% vs. 15%, $p< 0,0005$), gestosis of medium and heavy degree more often have teenage mothers – 6,2%, in control group – 4%. Oedemas of pregnant women also often have teenagers – 61 (7% vs. 1.8%). This was statistically significant ($\chi^2= 17,2$, $p=0,00003$).

Premature pouring out of waters happened in 22% in the basic group and 30% ($p < 0,0001$) in the control group, prolonged waterless period – 5% and 2% ($p < 0,0005$).

Teenagers more often need instrumental swinging of covers 183 (20%), against 7,8%. This was statistically significant ($\chi^2 = 53,7$, $p = 0,00000$). They more often have lack of waters – 84 (9,3%) in the control group – 5% ($\chi^2 = 10,8$, $p = 0,0009$). Anomalies of birth activity have women of different ages with same frequency, but weakness of birth activity meets in 7,5% of teenage mothers, against 3,6% ($\chi^2 = 11,1$, $p = 0,0008$). Childbirth of the majority of teenagers and elder women happens through natural birth ways. 92 (10%) teenagers had caesarean section as compared with 117 (16,3%) in the control ($\chi^2 = 11,2$, $p = 0,003$). Exfoliation of the placenta more often happened among teenagers 15 (1,6%), against 6 (0,8%).

The prematurity rate (gestational age of less than 37 weeks) was 6,6% in teenagers compared with 2% in the control. This was statistically significant ($\chi^2 = 45,5$, $p = 0,00000$).

Teenagers more often need episiotomy 8% ($p < 0,000001$), against 2%, but, in spite of this, 15% of teenage mothers have rupture of perineum, vagina and cervix of the uterus ($p < 0,000001$).

In the basic group were born 894 children, 486 boys (54,3%), 408 girls (45%). Birth weight of the children ranged from 840g to 4810g, average $3296 \pm 18,5$, in the control group ranged from 1300 to 5020, average $3529 \pm 18,4$ g. The teenagers had 7,2% of low birth weight babies (birth weight $< 2,5$ kg) compared with 1,6% in the control ($\chi^2 = 27,2$, $p = 0,00000$). There were 59 preterm (< 37 weeks of gestation) and 7 post mature deliveries (≥ 42 weeks). Birth asphyxia (Apgar score < 7) amongst the babies born to teenagers was 8,1% compared with 5,1% in the control. The difference was statistically significant ($\chi^2 = 6,1$, $p = 0,01$) [table 2].

Small for gestational age at a birth 8 % of children among young mothers. Morph functional immaturity has 9,2% of teenage mothers newborns, against 1,4 % ($p < 0,000001$). Any symptoms of prenatal defeats of central nerve system have 10% of newborns in the control group, in the basic group – 5,3%. On the second stage of nursing 7,6 % and 6,8% of children of the basic and the control groups are transported to the Perinatal Center of National Center of Medicine. This was not statistically significant ($p = 0,5$) (tabl. 1).

8 newborns have died in early neonatal period, this makes 8,94 %. In structure of the direct reasons of death on the first place is lung pathology (3 children), on the second – congenital pneumonia (2), on the third – congenital anomalies (2) and asphyxia (1). 13 teenage mothers refused from their children.

Conclusions

Carried out researches have shown, that complications of pregnancy and childbirth of young mothers in Yakutsk exceed pathological conditions of newborns of elder women. Among somatic diseases on the first place are thyroid gland diseases, on the second is chronic pyelonephritis, on the third are cardio-vascular diseases. Among gynecologic pathologies diseases, passed by sexual ways prevail. Ureaplasmosis in the group of teenage pregnant women makes 16,1%, chlamidiosis - 12%, mycoplasmosis 11,6%, in the control group 7,7%, 7,7% and 5,6% accordingly. Among pregnancy complications in the group of teenage mother's pregnancy induced hypertension develops more often (21%). Weakness of birth activity meets in 7,5% of teenage mothers, against 3,6% in the control group. The babies of teenagers had more low-birth-weight, preterm deliveries, morph functional immaturity, birth asphyxia and were statistically significant.

It is necessary to propagandize actively healthy way of life among rising generation, to work on prevention of unwanted pregnancy among teenagers, lead sanitary-educational work about family planning, optimize methods of clinic observing of teenage pregnant women in consulting centers, lead first prophylactic work together with teachers, psychologists, pediatricists and gynecologists.

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Table 1. Clinical characteristic of the infants

Outcome measures	Teenagers (%) n=894	Control (%) N=714	χ^2	P value
Birth asphyxia	73 (8,1%)	37 (5,1%)	6,1	0,01
Small for gestational age	77 (8,6%)	41 (5,7%)	4,8	0,02
Preterm Deliveries (Gestational Age <37 weeks)	59 (6,6%)	14 (2%)	45,5	<0,000001
Jaundice	46 (5,1%)	18 (2,5%)	7,1	0,007
Congenital anomaly	22 (2,4%)	30 (4,2%)	3,8	0,04
Respiratory distress syndrome	18 (1,9%)	5 (0,3%),	4,8	0,02
Morph functional immaturity	83 (9,2%)	10 (1,4%)	45,2	< 0,000001
Admission into SCBU	72 (8%)	52 (7,2%)	0,33	0,5

SCBU: special care baby unit

Factors of coronary artery disease unfavorable clinical course in Yakutia (results of 7-year follow-up)

Romanova T.A., Voevoda M.I. *, Tarabukina L.V., Petrova I.R., Tomskaia T.Ju.
RH#1-NCM, Yakutsk,

* Institute of therapy RAMS, Novosibirsk,
YSC of complex medical problems SB RAMS, Yakutsk

In our research we have tried by means of complex clinical-functional and angiographic inspections to ascertain factors of unfavorable CAD (coronary artery disease) course in the remote 7-year period.

Keywords: CAD fatal outcomes, clinical-anamnestic risk factors of CAD, LV structural-functional indexes, degree of atherosclerotic lesion of coronary arteries, survival rate of CAD patients.

Background: Last decade among the population of Yakutia steady growth of CAD (coronary artery disease) morbidity is marked. Main causes of death rate of the population of Republic are illnesses of blood circulation system, more than half of them are coronary artery diseases [1]. Results of numerous epidemiological researches proved the significance of risk factors contribution to cardiovascular morbidity and mortality [2,3]. However, in the Yakut population, prognostic influence of risk factors on fatal outcome of CAD was not studied.

Research objective: To define connection of clinical-anamnestic data, functional and angiographic indexes of severity of CA atherosclerotic lesion with development of fatal cases of CAD course in patients of native and non-native nationality of Yakutia for the 7-year follow-up period.

Methods: 126 patients with CAD, verified angiographically since 2000 for 2001, have been included in research. For assessment of clinical state complaints, the anamnesis, the data of objective research of patients have been analyzed. The old myocardial infarction (MI), acute cerebral circulation impairment (ACCI), diabetes mellitus (DM), arterial hypertension (AH) and burdened heredity were taken into consideration. Data were received at poll, physical inspection of patients, and also on the basis of available medical documents, records in the clinical case record and out-patient card. The algorithm of research included: a biochemical laboratory blood test, electrocardiography (electrocardiogram), heart ultrasonic investigation (EchoCG), duplex ultrasonic investigation of carotids and vessels of the inferior extremities, Holter monitoring of electrocardiogram and selective coronary angiography (CAG) with ventriculography. CAG was performed in conditions of X-ray operation room on «Angioscop-33D with DCA Digitron Card» Siemens firm (Germany). Research was carried out under the practical standard by a puncture of a femoral artery according to Seldinger, by transfemoral access. For the characteristic of a state of coronal arteries the classification developed by J.S.Petrosyan and L.S. by Zingerman (1974) was used. On outcome of disease patients have been divided into 2 groups: the first- patients survived to the 7th year of follow-up - 110 (84 %), the second - the deceased - 16 (12,7 %). Among the deceased patients with CAD men - 87,5 %, women - 12,5 %.

Statistical processing was made with use of a package of statistical programs SPSS for Windows (version 17.0). Level $p < 0,05$ was considered as the test of significance.

Findings of investigation and discussion.

The patients who survived and not for the 7-year follow-up, were comparable on sex, body mass index, CAD risk factors, the experience of the ischemic and hypertensive anamnesis, CAD clinical manifestations: penetrating and non-penetrating myocardial infarction in the anamnesis, FC of stenocardia. However, CAD patients of the 2nd group in comparison with the

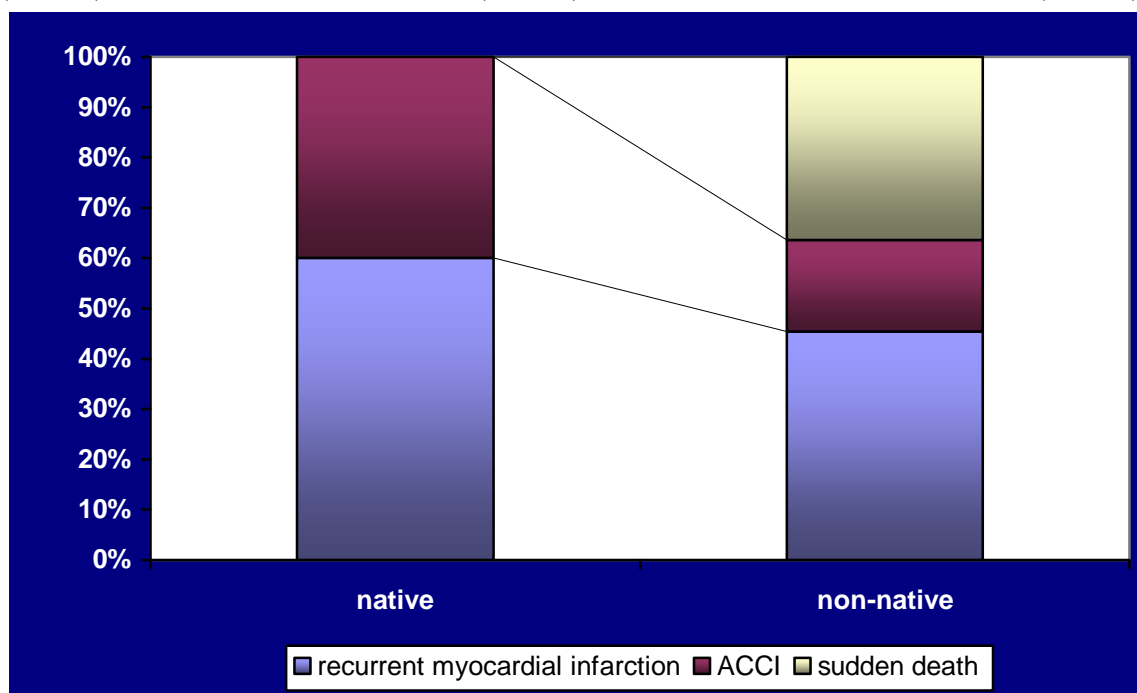
survived patients significantly more often initially have concomitant pathology - II type diabetes mellitus ($p=0,023$). It is possible to emphasise that in CAD patients presence of diabetes mellitus has affected on death rate for the 7-year follow-up (table 1).

Table 1

Relative initial clinical-anamnestic characteristic of groups of survived patients and the deceased for 7 –year follow-up

Index	I group patients-survivors (n=110)	II group died patients (n=16)	p
Age	56,75±0,64	51,38±1,61	0,328
Sex (m/f), person (%)	102 (92,7)/8 (7,3)	14 (87,5)/2 (12,5)	0,470
Body mass index, kg/m ²	27,21±3,7	27,19±0,75	0,990
Body mass index above 25 kg/m ² , person (%)	79 (71,8)	12 (75)	0,791
CAD duration, years	4,60±0,31	5,13±0,68	0,544
Penetrating myocardial infarction (macrofocal), person (%)	73 (66,4)	12 (75)	0,449
Non-penetrating myocardial infarction (microfocal), person (%)	49 (44,5)	10 (62,5)	0,179
Stenocardia, person (%)	108 (98,2)	16 (100)	0,910
FC-I	5 (4,5)	1 (6,3)	
FC-II	63 (57,3)	10 (62,5)	
FC-III	40 (36,4)	5 (31,3)	
AH duration, years	6,96±0,72	10,44±2,53	0,104
Max. SAP, mm	169,95±2,72	165,94±7,87	0,605
Max. DAP, mm	100,50±1,35	97,50±3,10	0,424
Arterial hypertension, person (%)	93 (84,5)	11 (68,8)	0,484
I d.	19 (17,3)	2 (12,5)	
II d.	48 (43,6)	6 (37,5)	
III d.	26 (23,6)	3 (18,8)	
Hyperlipidemia, -“-	82 (74,5)	12 (75)	0,969
ACCI in anamnesis, -“-	4 (3,6)	2 (12,5)	0,120
Smoking, -“-	83 (87,3)	13 (81,3)	0,611
Diabetes mellitus, -“-	2 (1,8)	2 (12,5)	0,023
Burdened family anamnesis, -“- (in 2 and more relatives)	81 (73,6)	15 (93,8)	0,078
Myocardial infarction	27 (24,5)	4 (25)	0,969
Stroke	30 (27,3)	3 (18,8)	0,469
Hypertension	72 (65,5)	11 (68,8)	0,795
Diabetes mellitus	6 (5,5)	0 (0)	0,338

The causes of CAD fatal cases within 7 years were: recurrent myocardial infarction in 8 (50 %) cases, ACCI - in 4 (25 %) and sudden death - in 4 (25 %) cases.



The causes of lethal outcomes in patients of native and non-native nationality for the 7-year follow-up ($p=0,246$)

From total number of non-survived patients 5 (31,3 %) - patients with CAD of native nationality (Yakuts), 11 (68,7 %) – of non-native (Russians). The recurrent myocardial infarction was a death cause for the 7-year-follow-up in 3 patients of native and 5 patients of non-native nationality. ACCI - in 2 patients of native and 2 patients of non-native nationality (figure). 4 patients suddenly died, all of them are representatives of non-native nationality of Yakutia. Statistically significant distinctions on frequency of the survived and deceased patients among native and non-native nationality are not revealed ($p=0,246$). For the 7-year follow-up 110 patients with CAD, including 51 (46,4 %) representatives of native nationality and 59 (53,6 %) - representatives of non-native nationality of Yakutia have survived.

Comparison of clinical-anamnestic data among the survived patients with CAD has revealed significant distinctions between indigenous and non-indigenous on age and AH presence. Thus, the indigenous patients who have survived to the 7th year of follow-up were younger, than non-indigenous and more often suffered concomitant AH ($p=0,010$; $p=0,003$).

At comparison of clinical-anamnestic indexes in the survived and the deceased during follow-up among non-indigenous patients with CAD it was established that the 7-year survival rate in patients without ACCI in the anamnesis and the burdened heredity was better, than in the patients having such anamnestic indexes ($p=0,001$; $p=0,041$).

In group of indigenous CAD patients, the 7-year survival rate in patients without a diabetes was better, than in patients initially suffering CAD with a concomitant type II diabetes ($p=0,0001$).

By results of ultrasonic investigation of heart we had revealed that initial linear indices of LV dimensions of the survived statistically significantly differed with similar indexes of the deceased patients (table 2).

Table 2

Comparison of LV dimensions indexes in the survived and the deceased to the 7- year follow-up of CAD patients

Indices	I group (n=110)	II group (n=16)	p
LVBWThd, sm	1,05±0,02	1,05±0,04	0,934
LVBWThs, sm	1,44±0,02	1,31±0,04	0,044
IVSThd, sm	1,07±0,02	1,02±0,05	0,375
IVSThs, sm	1,44±0,02	1,32±0,04	0,065
LV EDD, sm	5,38±0,06	6,02±0,18	0,0001
LV ESD, sm	3,56±0,07	4,06±0,13	0,007
EF, %	60,93±0,96	52,31±1,70	0,001
LV Mass, g	222,66±6,26	263,06±18,46	0,025
LV Mass ind.	131,40±3,71	154,42±10,55	0,031

So, LVBWThS, EF average indexes were significantly higher, but EDD and ESD indexes were significantly lower in the survived patients with CAD in comparison with non-survived patients for the 7-year follow-up.

IVSThs index initially tended to decrease in group of the deceased patients ($p=0,065$) in comparison with an index in group of the survived patients. The LV mass was significantly larger, and an index of LV mass authentically was higher in group of the deceased patients in comparison with the survived group. Thus, for the patients who have not survived for the 7-year follow-up, initially maximum changes of LV geometry leading to decrease in a pumping ability and contractive myocardium function were characteristic.

At comparison of LV structurally functional state in patients of indigenous and non-indigenous nationality, survived and non-survived for years of follow-up, statistically significant distinctions are not found.

According to coronary angiography since 2000 for 2001, initial comparison of types of heart blood supply, weight of atherosclerotic lesion of coronary arteries between two groups of patients and in groups, between patients of indigenous and non-indigenous nationality is made. In patients with CAD, survived and deceased for the 7-year follow-up, comparison has not revealed significant distinctions by heart blood supply type. The survived patients in 40 % of cases had the balanced type, in 33,6 % - the right type and in 26,4 % of cases - the left type of heart blood supply. Among the deceased patients initially in 50 % of cases the balanced type of blood supply, in 37,5 % - the right type and in 12,5 % - the left type of heart blood supply has been found.

Comparison of weight of atherosclerotic lesion of coronary arteries has shown that in deceased patients the multivascular atherosclerotic lesion of a coronary channel in comparison with the survived patients ($p=0,031$) significantly more often is marked (table 3).

Table 3

Comparison of degree of CA atherosclerotic lesion in the survived and non-survived CAD patients, prs. (%)

Weight of CA atherosclerotic lesion	Total (n=126)	I group (n=110)	II group (n=16)	p
No critical CA stenosis	34	32 (29,1%)	2 (12,5%)	0,165
1 CA critical stenosis (one-vascular)	51	46 (41,8%)	5 (31,3%)	0,423
2 CA critical stenosis (two-vascular)	31	26 (23,6%)	5 (31,3%)	0,510
3 CA critical stenosis (three-vascular)	10	6 (5,5%)	4 (25%)	0,008

Comparison of severity level of CA atherosclerotic lesion between the survived and non-survived patients of non-indigenous nationality for the 7-year follow-up has shown that in the survived non-indigenous patients at initial CAG three-vascular CA lesion was met significantly less often in comparison with non-survived patients ($p=0,041$). In group of the indigenous, survived and non-survived patients with CAD, statistically significant distinctions on weight of CA atherosclerotic lesion were not marked (Table 4).

Table 4

Comparison of weight of CA atherosclerotic lesion in the CAD indigenous and non-indigenous patients, prs. (%)

Weight of CA atherosclerotic lesion	Survived patients (n=110)		p 1-2	Deceased patients (n=16)		p 3-4	p 1-3	p 2-4
	Indigenous pts (n=51)	Non-indigenous pts (n=59)		Indigenous pts (n=5)	Non-indigenous pts (n=11)			
	1	2		3	4			
No CA critical stenosis	13 (25,5)	19 (32,2)	0,794	1 (20)	1 (9,1)	0,157	0,788	0,124
1 CA critical stenosis (one-vascular)	25 (49)	21 (35,6)	0,145	1 (20)	4 (36,3)	0,361	0,220	0,961
2 CA critical stenosis (two-vascular)	11 (21,6)	15 (25,4)	0,924	2 (40)	3 (27,3)	0,659	0,356	0,898
3 CA critical stenosis (three-vascular)	2 (3,9)	4 (6,8)	0,778	1 (20)	3 (27,3)	0,505	0,133	0,041

At comparison of ventriculography results between patients of I and II groups significant distinctions are revealed. In patients of the II group LV aneurysms initially have been revealed in 7 (63,6 %), and I - only in 23 (23,7 %) patients ($p=0,005$). Thus, in CAD patients the

unfavorable forecast has connected with presence of postinfarction LV aneurysms and, on the contrary, at the patients who do not have LV aneurysms, the 7-year-old survival rate was significantly the best.

At studying of death causes in the patients of indigenous and non-indigenous nationality having various weight of a lesion of coronary arteries, the following is revealed: among the patients who do not have critical stenoses in CA, 2 patients have died. The causes of a lethal outcome were ACCI - in the native patient and sudden death – in the non-native patient. In case of CA 1-vascular lesion 5 patients have died, including 4 non-native (2 - recurrent MI, 2 - sudden death) and 1 native- recurrent MI. Among the patients having CA 2- vascular lesion, 5 patients have died, including 3 non-natives (1- recurrent MI, 1 - ACCI, 1-sudden death) and 2 natives (1- recurrent MI, 1- ACCI). Among the deceased patients having 3-vascular lesion (n=4), 3 - representatives of non-native and 1 - native nationality. In the non-native patients a cause of death in 2 cases were recurrent MI and in 1 case - ACCI, in the native - recurrent MI.

46 (36.5 %) CAD patients were operated (CABG and MBG), the rest 80 (63.5 %) patients had only standard medicamentous treatment. From total number of CAD patients with surgical revascularization of myocardium, 41 (89.1 %) patient has survived, including 18 indigenous and 23 non-indigenous. After operative treatment within 7 years 5 (10.9 %) patients have not survived, all of non-indigenous nationality. From them, to 4 patients at operative treatment 2 autovenous shunts have been applied, to 1 patient - 3 shunts. Analyzing outcomes of operative and only medicamentous treatment influence of a choice of treatment method on 7-year-old survival rate of CAD patients is not revealed.

Medicamentous treatment was received by all patients included in our research. At studying of influence of drugs on 7-year-old survival rate of patients with CAD significant communication with development of CAD fatal course at a choice of ACE inhibitors, β -blockers, Ca antagonists, vasodilators is not revealed. At comparison of duration of statins reception (probucol, lipostat, vasilip) significant distinctions in groups of the survived and non-survived patients by 7 year of follow-up have been revealed. Patients with fatal CAD course in comparison with the survived more often did not take statins and, on the contrary, patients with CAD which have survived for the 7-year-follow-up, constantly, within a year received hypolipidemic therapy. Thus, the 7-year-old survival rate in the patients who were constantly taking statins was the best in comparison with the patients who were not.

Table 5

Duration of statins reception in groups of the survived and non-survived patients to the 7-year - follow-up, pts %

Statins reception	Total (n=126)	I group (n=110)	II group (n=16)	p
Constantly, within a year	36 (30.2)	37 (33.6)	1 (6.3)	0.028
Less than 6 months in a year	79 (62.7)	68 (61.8)	11 (68.6)	0.590
Did not	9 (7.1)	5 (4.5)	4 (25)	0.004

Prognostic value of clinico-anamnestic indexes remains rather significant, despite introduction of new hi-tech methods of CAD diagnostics. According to the majority of researches, age of patients, AH in anamnesis, old myocardial infarction, diabetes, disturbances of cardiac rhythm, quantity of lead on an ECG with lifting of ST segment play an important role in CAD prognosis [5-7]. In our research it is revealed that clinico-anamnestic factors affecting on CAD forecast during the 7-year-follow-up in patients of indigenous and non-indigenous nationality, differ. In group of non-indigenous patients with CAD it is an ACCI in anamnesis and

the burdened heredity. In group of indigenous patients with CAD - presence of concomitant disease - type II diabetes mellitus.

In group of the survived CAD patients significant distinctions also have been found: the indigenous patients, who have survived to the 7 year of supervision, were younger, than non-indigenous and more often suffered from concomitant AH.

According to some authors, mild augmentation of EDV and ESV in LV in patients after a myocardial infarction in 4-5 times increases risk of death. At observing patients with CAD within 3 years, Udelson J.E. [et al.] have positioned that on CAD prognosis the maximum influence render increase of EDD, EDV, ESV and decrease in LV EF [4, 6].

Studying of influence of structurally functional LV status on CAD prognosis in our research has shown that for the patients who have not survived for the 7-year-follow-up, initially maximum changes of LV geometry are characteristic, indicating decrease of pumping and contractile functions of myocardium. So, average indexes of LVBWThS, EF were significantly lower, and indexes EDD, ESD, LV mass, LV mass index significantly higher in the non-survived for the 7-year-follow-up of CAD patients in comparison with the survived patients.

Comparison of LV structural-functional state between patients of indigenous and non-indigenous nationality among the survived and the non-survived during follow-up has not revealed statistically significant distinctions.

At forecast studying at CAD in a number of researches the association of CA multivascular lesion with unfavorable outcome has been revealed [7]. Thus, in patients, died during the 7-year-follow-up, by results of initial CAG the multivascular atherosclerotic lesion of a coronary channel in comparison with the survived patients significantly more often was marked. In group of non-indigenous patients with CAD in the survived patients three-vascular CA lesion was met significantly less often in comparison with non-survived patients, and in group of indigenous patients distinctions on weight of atherosclerotic CA lesion in survived and non-survived CAD patients were not marked. Thus, it is possible to assume that in the aborigines of Yakutia suffering from CAD, the disease unfavorable outcome was not associated with multivascular CA lesion unlike non-indigenous CAD patients.

At present, agree to the data of the majority of researches, the forecast for patients with CAD is not defined by a choice of various methods of treatment - invasive (CABG) or optimal medicamentous therapy [10,12]. We also have not revealed influence of a choice of a treatment method on 7-year-survival rate of patients with CAD. However, at low adherence to application of statins in CAD medicamentous therapy, the forecast was worse, than in patients, receiving hypolipidemic drugs for a long time.

There are convincing numerous evidences of necessity of application of hypolipidemic therapy in patients with CAD [9, 13]. In 1994 the Scandinavian research 4S in which 4444 CAD patients received simvastatin, has shown decrease on 34 % of frequency of heavy coronary complications, on 42 % - coronary death and on 30 % - the general death [11]. Our research also has shown that duration of statins reception has positively affected on 7-year-survival rate of CAD patients.

In conclusion, it would be desirable to notice that in CAD patients the prognosis substantially is defined by initial clinico-anamnestic factors, LV structural- functional state, weight of CA atherosclerotic lesion and adherence to hypolipidemic therapy. In our research for the first time the distinctions in the significance of prognostic factors on the 7-year survival rate of CAD patients in group of indigenous and non-indigenous Far North residents are revealed, that is most probably explained by genetical features and hereditary aggravation of populations of Yakutia and demands the further studying of major risk factors for each ethnic group of patients, for the purpose of initiating of individual programs of CAD secondary prevention.

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Bannaev I. F., Palshina A. M., Palshin G. A., Tomskiy M.I.

The clinical course of arterial hypertension in elderly and senile age patients with the fracture of proximal femur complicated by system osteoporosis

242 elderly and senior people with proximal femur fractures have been studied for the development of the arterial hypertension. The research showed that the fracture of the proximal femur of senior patients is accompanied by destabilization of the arterial hypertension and increasing risk of developing disease complications from the equations of the cardiovascular system.

The actuality. In the city of Yakutsk frequency proximal femur fractures against osteoporosis (OP) on the average for a year makes 162,2 on 100 000 persons and exceeds the all-Russian indicators (105,9) in 1,5 times (2, 6). 60 % of patients with pathological proximal femur fractures (PFF) suffer with arterial hypertension (AH) (5). Thus, combination AH and PFF is not only important medical, but also a social problem.

The work purpose. To study the current of AH at elderly and senior patients with fracture of proximal femur complicated by osteoporosis.

Material and research methods. The research is spent on the base of the Republican hospital №2 - the Center of emergency medical aid in Yakutsk. 242 elderly and senior age patients with AH and with fracture of proximal femur complicated by osteoporosis are surveyed. On the mechanism all fractures have been received at falling from height of the growth. Diagnosis AH established according to National recommendations on diagnostics and treatment AH, developed by Committee of experts of the All-Russia scientific organization of cardiologists (Moscow, 2010).

Results. The raised level the arterial pressure (AP) is registered at hospitalization at 232 (95,9 %) patients. During the hospitalization the quantity of patients with level AP with the following AH I - II - III the item in both age subgroups changed nonlinear with fluctuations, both towards reduction, and towards increase. Within the first 5 days of hospitalization with level systolic AP(SAP) =140-159 mm hg varied relative density of patients at patients of advanced age from $31,7 \pm 4,2$ % (3 days) to $38,3 \pm 4,4$ % (2 days), at patients of senile age - from $32,8 \pm 4,2$ % (3 days) to $37,8 \pm 4,4$ % (4 days). Relative density of patients with level systolic AP=160-179 mm hg varied to a subgroup of patients of advanced age from $21,7 \pm 3,8$ % (5 days) to $30,8 \pm 4,2$ % (1 days), in a subgroup of patients of senile age - from $16,4 \pm 3,4$ % (5 days) to $36,9 \pm 4,4$ % (2 days).

Thus the maximum values the SAP to figures $176,7 \pm 2,1$ mm hg were observed within 1 days of hospitalization and to figures $175,5 \pm 2,0$ mm hg in day of operation.

Discussion. Research has shown that AH at patients elderly and senior age with fracture of proximal femur complicated by osteoporosis is characterized the astable current, the raised variability of systolic hypertension, high level of pulse pressure, frequent development of cardiovascular complications ($p=0,0005$).

Conclusions. Fractures proximal department of a femur at patients of senior and senile age is accompanied by destabilization of current AH and increases risk of developing disease complications from the equations of the cardiovascular system.

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Authors:

1. Bannaev Imraddin Farrukh-oglu - physician at Republican Hospital № 2
2. Palshina Aida.M. - Associate Professor, Head of Department of Hospital Therapy, Professional Diseases and Clinical Pharmacology at North-Eastern Federal University named after M.K. Ammosov.
3. Palshin Gennady A., MD, professor, deputy Director of Medical Institute, North-Eastern Federal University.
4. Tomsky Mikhail I., MD, professor, director of YSC CMP of the Siberian Branch of the Russian Academy of Sciences.

Cytokines and Intrathecal Synthesis of Oligoclonal IgG in Viliuisk Encephalomyelitis and Multiple Sclerosis Patients

Sivtseva T.M., Chemezova R.I., Vladimirtsev V.A., Nikitina R.S., Danilova A.P., Popova T.E., Okoneshnikova L.T., Osakovsky V.L.

Interleukin 6(IL6), interferon gamma (INF γ) and interleukin 18 (IL18) were investigated in cerebrospinal fluid (CSF) and serum of Viliuisk encephalomyelitis (VE), multiple sclerosis (MS) and other neurological diseases patients. IL 18 and INF γ production in VE and MS were significant different. There had been a significant increase of IL 18 in CSF of VE patients and INF γ in CSF and serum of MS patients. High level of INF γ in CSF of MS patients was associated with presence of oligoclonal IgG.

Key words: Viliuisk encephalomyelitis, multiple sclerosis, cytokines, intrathecal synthesis of oligoclonal IgG.

The aethiology and pathogenesis of the disease of Viliuisk encephalomyelitis (VE) remain unclear up to the day. Histopathologic findings in the cases of acute and chronic inflammation in brain and spinal cord of died VE patients specify long-lasting inflammatory process [11]. Investigation of cerebrospinal fluid (CSF) of VE patients have revealed intrathecal synthesis of oligoclonal IgG, but cause of local immune response remains unknown [15].

Some researchers suggest significant role of immunogenetic factors in VE pathogenesis [3, 5, 8]. Changes in lymphocytes population and depression of interferon- α system were shown in blood of VE patients [2, 4]. Significant association was found between VE and two single nucleotide polymorphisms (SNPs) in third intron of interferon gamma (INF γ) gene [3].

Last years in the Yakut population other disease of nervous system in pathogenesis of which immunopathologic mechanisms play an essential role began to extend - multiple sclerosis (MS). Changes in cytokines production may have important contribution in the development of immunopathologic process in central nervous system (CNS) and influence to local immune response [6, 7].

The purpose of research was comparative analysis of the levels of proinflammatory cytokines in blood and liquor of VE and MS patients and their association with intrathecal synthesis of oligoclonal IgG.

Materials and methods

Three groups of neurologic patients have been investigated:

Viliuisk encephalomyelitis. There were analysed blood serum and liquor of 16 VE patients surveyed in the hospital and during expeditions of Institute of Health. All VE patients had the chronic form of disease with duration from 3 till 54 years (on the average 22.3 ± 13.4 years). This group consisted of 14 individuals of the Yakut and 2 of the Evenk nationality, 6 women, 10 men, in age from 38 till 74 (on the average 51.9 ± 11.2 years).

Multiple sclerosis. There were analysed blood serum and liquor of 11 MS patients undergone medical examination in the Republican hospital №2 - the Center of emergency medical aid. Seven patients had remitting, 1- primary-progressing and 3 – secondary forms of disease with duration from 1 till 18 years (on the average 7.1 ± 5.3 years). This group consisted of 9 individuals of the European Russian and 2 of the Yakut nationality, 6 women, 5 men, in age from 17 till 55 (on the average 38.5 ± 12.3 years).

Other neurologic diseases (Oth.n.d.). This group consisted of 9 patients with other not inflammatory diseases of nervous system with the following diagnoses: sensitive dystonia - 1 person, hydrocephaly - 1, insult - 2, dyscirculatory encephalopathy - 2, epilepsy - 3 individuals, all of them of the Yakut nationality, 7 women, 2 men, in age from 18 till 72 (on the average 40.1 ± 19.0 years).

Intrathecal synthesis of IgG was studied using the method of isoelectric focusing as previously described [10]. Results were estimated as positive when oligoclonal (two or more) bands were identified in the CSF but not in the accompanying serum of the same patient.

In blood serum and liquor of the patients contents of interferon gamma (INF γ), interleukin-6 (IL-6), interleukin-18 (IL-18) were investigated by means of immune-enzyme analysis with use of commercial kit of Joint-Stock Company "Vector-best", Russia and the equipment of Joint-Stock Company "ПИК-Н", Russia.

Statistical processing was made by means of the program Statistika 8.0. Results were described by calculation of medians and 25 and 75 percentiles. The significance of the results was determined using of nonparametric criteria of Kruscal-Wallis, Mann-Whitney and Wald-Wolfowitz.

Results

Intrathecal synthesis of oligoclonal IgG

Oligoclonal bands of IgG were identified in 9 from 16 VE patients. Duration of illness of these patients was $15,3 \pm 4,9$ years. Patients with negative results have more long duration of illness ($31,1 \pm 15,9$ years) ($p=0,02$). These results suggest early received data [1].

In the group of MS intrathecal synthesis of IgG was determined in 6 from 11 patients. Five of them have remitting and one primary progressing forms of disease, all European. Five

patients have negative results, two of them have optic form, one atypical (pseudotumor), one remitting and one secondary progressing forms of disease. Two individuals without oligoclonal bands were Yakut, other European nationalities.

The group of other neurologic diseases consisted of patients with not inflammatory diseases, who had no intrathecal synthesis of IgG.

Cytokines IL-6, INF γ , IL-18

Results of cytokines IL-6, INF γ , IL-18 analysis are shown in table 1.

The content of IL-6 in serum did not differ in three investigated groups of patients ($p=0.16$ by criterion of Kruskal-Wallis). Increased level of IL-6 (more then 10 pg/ml) in serum was determined in serum of 3 individuals in the group of VE patients. This fact may reflect predisposition of these patients to systemic inflammation, not related with investigated pathology. Content of IL-6 in liquor was examined only in VE patients and it did not reveal essential increase.

INF γ level in serum of VE and Oth.n.d. groups was not higher than in healthy donors (not more than 10 pg/ml). Content of INF γ in serum of MS patients was statistically significantly higher in comparison with VE and Oth.n.d. groups ($p=0.01$) (fig. 1).

In liquor content of INF γ protein was increased in three groups of patients in comparison with serum (table 1) that testified to course of inflammatory process in brain of these patients. Despite of increased content of INF γ this parameter was statistically significantly lower ($p=0.006$) in VE patients in comparison with MS patients and Oth.n.d group (fig.1). This fact specifies limitation of production of protein of this cytokine in VE patients in comparison with other neurologic diseases, that possibly is the specific feature of VE pathology.

Content of IL-18 in serum did not differ in three groups whereas in liquor statistically significant distinctions were revealed (table 1). Thus the highest values were revealed in VE patients (fig. 2). This is the second specific feature of VE pathology that gives the evidence of participation of cells of brain tissue producing cytokine IL-18 in pathogenesis of this disease.

Cytokines and intrathecal synthesis of IgG

The analysis of cytokine status of patients depending on revealing intrathecal synthesis of IgG shows that in three groups of patients with intrathecal synthesis of IgG or at its absence the level of cytokines IL-6, INF γ and IL-18 in serum does not change. The positive association with intrathecal synthesis of IgG was revealed in liquor only in MS patients and only with cytokine INF γ ($p=0.02$) (fig.3). Other cytokines (IL-6, IL-18) do not show such dependence.

Our results showed some peculiarities of immune response in brain of VE and MS patients. As known local immune response develop with participation of both cells of peripheral

immune system and cells of brain tissue. In inflammation condition T-and B-cells migrate across blood-brain barrier from peripheral circulation and after activation T-lymphocytes into Th2 cells begin to produce IgG intrathecally. Activated microglia and astrocytes carry out antigens presentation function in brain [14]. These glial cell populations stimulate T-lymphocytes proliferation and produce $\text{INF}\gamma$ and IL-18 respectively [13]. IL-18 is one of primary factor of induction $\text{INF}\gamma$ by microglia [9]. Glial populations have different efficiency to restimulate distinct T cells subsets, like that microglia may activate Th1 and Th2 cells, whereas astrocytes mainly Th2 [12]. This peculiarity will manifest in forming of cell-mediated or humoral immune response in brain.

Lower level of IL-18 and high level of $\text{INF}\gamma$ in CSF of MS and oth.n.d. groups in comparison with VE patients shows, that immune response in CNS of these patients is mainly cell-mediated.

High level of IL-18 and significantly low level of $\text{INF}\gamma$ in CSF suggest that VE patients form preferentially humoral type of immune response in CNS. It seems that VE patients have problem with production of $\text{INF}\gamma$ that fill in activation and proliferation of astrocytes (gliosis). The present data confirm early received association between VE and $\text{INF}\gamma$ gene.

Conclusion

VE patients are characterized by raised levels of IL-18 and $\text{INF}\gamma$ content in liquor whereas in serum these parameters remain at the level of healthy people. Despite of raised level $\text{INF}\gamma$ in VE patients this parameter is statistically significantly lower ($p=0.006$) in comparison with MS patients and patients with other neurologic diseases. It gives evidence of restriction of production of protein of this cytokine in VE patients in comparison with other neurologic diseases that is specific feature of VE pathology. VE patients do not have association of $\text{INF}\gamma$ level with intrathecal synthesis of IgG.

In VE patients changes in intrathecal content of IL-18 are more expressed. In CSF its level is considerably higher than in MS patients and in group of other neurologic diseases. Contents of IL-18 in blood serum do not differ in three groups. Also there is no association of IL-18 level with intrathecal synthesis of IgG.

In MS patients content of $\text{INF}\gamma$ is increased both in serum and in CSF. The highest level of $\text{INF}\gamma$ is marked in CSF at presence of intrathecal synthesis of oligoclonal IgG that specifies positive association of these parameters.

The received results reflect distinctions in mechanisms of immunopathology of brain at VE and MS. At MS increased production of $\text{INF}\gamma$ both in blood and in liquor, but at VE intrathecal synthesis of IL-18 have most importance in development of immunopathology.

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Table 1.

Content of IL-6, INF γ , IL-18 in serum and CSF of VE, MS and oth.n.d. patients.

Parameter	Group of patients	Serum, pg/ml		CSF, pg/ml	
		Me (25-75%)	n-	Me (25-75%)	n
IL-6	VE	4 (3.4-15.4)	11	1.25 (1.15-1.45)	12
	MS	5.7 (5.2-8.5)	10		
	Oth.n.d.	5.7 (5.5-8.2)	8		
INF γ	VE	4 (3-4)*	11	7 (3.5-9.5)*	12
	MS	7 (6-19)*	11	20 (10-30)*	11
	Oth.n.d.	5 (3.75-6.5)*	8	18 (19-18.5)*	9
IL-18	VE	139.5 (90-210)	14	15.5 (13-20)*	10
	MS	125 (110-166)	11	4.6 (4.15-5.1)*	8
	Oth.n.d.	141 (110-219)	8	4.6 (3.8-7.8)*	9

Me (25-75%) – median and quartiles, - n-number of samples, * - $p < 0,05$

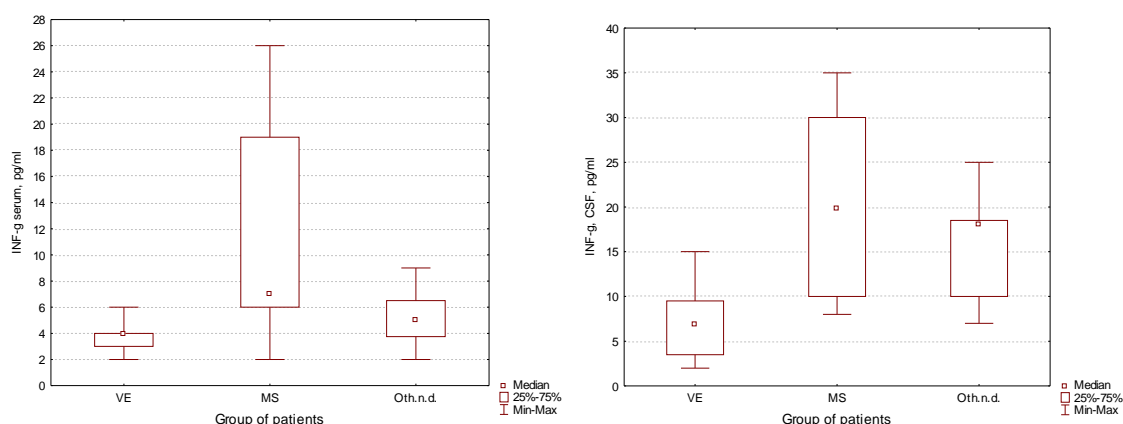


Fig. 1. Level of INF γ in serum and CSF of three groups of patients.

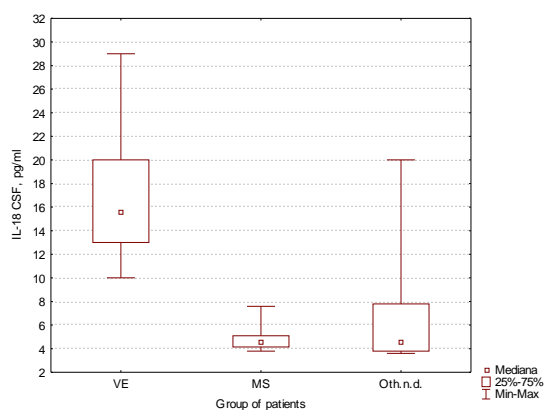


Fig. 2. Level of IL-18 in CSF of three groups of patients.

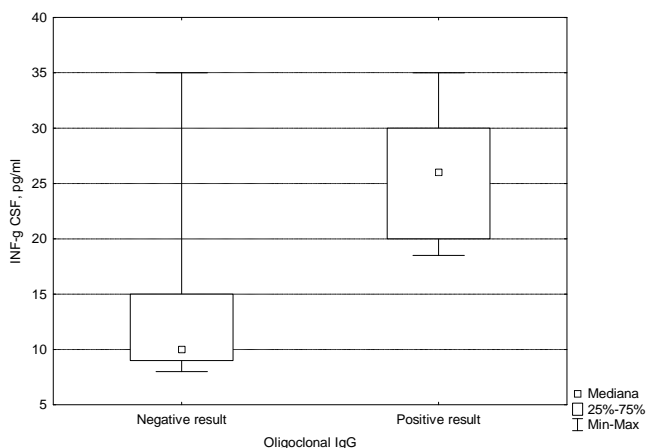


Fig. 3. Level of INF γ in CSF of MS patients with negative and positive results of oligoclonal IgG testing.

Federal State Scientifically Institution “Institute of Health”: Sivtseva Tatyana Mikhailovna – Ph.D., laboratory of genetic research, sivtceva@list.ru, Osakovsky Vladimir Leonidovich – PhD, head of laboratory of genetic research, iz_labgene@mail.ru, Chemezova Rita Ivanovna – head of clinical diagnostic laboratory, Vladimirtsev Vsevolod Afanasevich – Ph.D., department of viliuisk encephalomyelitis investigation, Nikitina Raisa Semenovna – head of hospital of Institute of Health, Danilova Albina Prokopevna - hospital of Institute of Health, Popova Tatyana Egorovna – Ph.D., Medical Institute of North-Eastern Federal University, scientific consultant of Center of Multiple sclerosis in Republic Sakha (Yakutia), phone: (411-2) 432318, Okoneshnikova Ludmila Timofeevna – head of Neurological Department of Republic hospital #2, head of Center of Multiple sclerosis in Republic Sakha (Yakutia), phone: (411-2) 432318
Address of “Institute of Health”: National Medical Center, Bldg C2, Sergelyakhskaya Rd, 677010 Yakutsk, Russian Federation, phone: (411-2) 36-15-36,

Haplotype diversity in the gene DMPK in myotonic dystrophy sample of patients from the Republic of Sakha (Yakutia) and in populations of Northern Eurasia

¹ S.K. Stepanova, ⁴ M.G. Spiridonova, ² A.V. Marusin, ³ A.L. Suhomâsova, ² V.A. Stepanov

¹ Yakut Scientific Center of integrated medical problems SB RAMS, Yakutsk

² Research Institute of Medical Genetics SB RAMS, Tomsk

³ Republican Hospital № 1-National Centre of Medicine, Yakutsk

⁴ Siberian state Medical University, Tomsk

Keywords: gene muscle protein kinase, polymorphic marker, the structure of haplotype, imbalance at clutch (imbalance of coupling), the yakut population, the population of Northern Eurasia.

Summary

The analysis of six single-nucleotide polymorphisms substitutions (SNP) in the gene muscle protein kinase (DMPK) responsible for the development of myotonic dystrophy (MD). Six population-based of Northern Eurasia (N = 778) and samples of representatives of indigenous population of Yakutia, MD patients. Given the population-genetic characteristics of the samples for the investigated locuses, the comparison of the samples from the frequencies of alleles, haplotypes, analyzed the structure of linkage imbalance in all the samples. Haplotypes associated with the disease were found, significant differences on the investigated between populations of the Ket, the Buryat, the Khanty and Russian were taped, coupling blocks in samples were shown.

Introduction

The aim of this work was the analysis of allelic and analysis haplotypic diversity in patients DM in the population of Yakutia and in 6 control samples on 6 locuses in the *DMPK* gene - *Dra III* (rs2070736), *Hha I* (rs572634), *Bpm I* (rs1799894), *Hph I* (rs527221), *Fnu4HI* (rs915915) and *Taq I* (rs10415988).

The myotonic dystrophy of Rossolimo – Steinert – Kirschmann - Batten (DM) is an autosomal-dominant, multisystem disease with a combination of clinical signs including myotonia, a muscular dystrophia, the defects of heart, subsequent iridescent of a cataract and endocrine disturbances [7]. It is known 3 types of the myotonic dystrophy. DM 1 type (about 98 % of all diseased) it is characterized by the beginning of muscular delicacy from distal muscles to proximal and has been described more 100 years ago in the European and North American populations. DM 2 type (exposed to approximately 2% of all cases) is characterized by the development of muscle weakness of proximal to distal, the mutation was found in 2001, was

described in 1998 in a big family in Minnesota [10]. The mutation leading to development MD of 3rd type has been found out in 2004 on 15 chromosome 15q21-q24 [1].

Range of the prevalence of myotonic dystrophy (DM 1) in the world ranges from 2.1 to average 14.3-4.0 -5.0 at 100 thousand [9]. In the Yakut population there is a high accumulation of MD -1: 4699, whereas the average prevalence of the disease in the world's population does not exceed 1: 10000. Range of the prevalence of DM in the regions of Yakutia is extremely wide and ranges from 1: 1 up to 818: 45455 [12]. One of the reasons for the accumulation of this pathology can be long geographic isolation of Yakut population. It is possible that the origin of the DM at the Yakuts is connected with the Caucasoid component of the gene pool, because the disease occurs mainly in Caucasoid populations [4].

It is supposed that all cases of myotonic dystrophy is based on one or a very small number of ancient mutation North-Eurasian origin with many media mutation or permutation. At DM I type the same mutation is found out in the myotonic dystrophy protein kinase (*DMPK*), located on a short shoulder 19 chromosomes in the field of 13.2.-13.3. The reason the disease is bound to expansion of number *CTG*- of repetitions in 3' – not broadcast of gene *DMPK* which is required for normal development and functioning muscle musculation [8]. There are a large number of publications for the study of *CTG*-repetition in the *DMPK* gene [3, 5, 11]. Studies of the same modular structure locus *DMPK* and its molecular genetic characteristics in population-based samples and in connection with myotonic dystrophy are not so much. In the literature and databases are fragmentary data on the frequencies of SNP and haplotypes in individual populations obtained on different sets of SNP [5], which exhibit significant interpopulation differences in the frequencies of haplotypes in the locus of *DMPK*.

This work presents the frequency characteristics of six polymorphic variants gene *DMPK* *Dra III* (rs2070736), *Hha I* (rs572634), *Bpm I* (rs1799894), *Hph I* (rs527221), *Fnu 4HI* (rs915915) and *Taq I* DNA polymerase (rs10415988), examined the genetic diversity of muscle protein gene in patients, healthy Yakuts and in five populations of Northern Eurasia, showing blocks of adhesion for each analyzed locus and analysis of associative observations haplotypic diversity in the above samples.

Materials and methods

In this work the DNA of 87 representatives of the indigenous population of Yakutia with confirmed diagnosis of "myotonic dystrophy", two control groups of Yakuts: 63 healthy relatives of patients and the population sample of 328 unrelated individuals living in central, vilusk, northern regions of RS (Y) similar to the patients and their relatives by age, sex and nationality were investigated. In addition to the Yakut population in the study included five

samples of Northern Eurasia (450 unrelated individuals, ethnicity which maternal line was posted to the 3-rd generation). It was the Russian population (100 people), buryats (100), kyrgyz (100), khants (100) and ket (50). The fence of a peripheral blood was made for DNA allocation only in the presence of the written informed consent. All the sick held clinical and instrumental researches, DNA-diagnostics on revealing of a heterozygotic carriage. DNA was excreted with a method phenol–chloroform extraction based on the standard methodology of peripheral blood lymphocytes. Study of polymorphic variants of specific stretches of gene investigated using the methods of polymerase chain reaction (PCR) and polymorphism analysis length polymorphism (RFLP), using the structure of the primers and the corresponding restriction enzymes that were described previously in the literature [6]. Products of restrictions were fractionated in 3% and 3.5% agarose gel. The DNA fragments were stained with ethidium bromide and visualized under UV light using a computer video on gel-documenting system «Bio-Rad». For polymorphic variant *Dra III* «T» an allele corresponded with amplified fragment in length 183 p.o., «G» an allele was taped by two fragments in length 158 and 25 p.o. Fragment in length 25 p.o. is often not visible due to its relative ease and because of this, a quick exit from the gel. For a site of *Hha I* "T" allele corresponded with amplified fragment in length 491 p.o., "C" allele was taped by two fragments in length 419 and 72 p.o. Fragment wasn't visible 72 p.o., as in the previous case, because its relative easiness. For a site *Bpm I* "G" allele had a length of 350 p.o., "C" allele was taped by two fragments in length 299 and 51 p.o. Fragment 51 p.o. was not also visible. "T" allele *Fnu 4HI* represented by two fragments – 127 and 155 p.n., «G» allele-Allele *Hph I* 282 p.n. These alleles presented by two fragments: "T"-124 +186 p.n., "G" -148 + 186 p.n. *Taq I* included alleles A and B, in length 676 and 574 p.n., respectively. Statistical analysis of results of the study was conducted using statistical software «Arlequin», «Haplowiew» and Fisher's exact test. Difference of the two compared values considered reliable the reliability of $r > 0.95$ if the probability of their identities have been less than 5%.

Results and discussions

Frequencies of genotypes and alleles, a heterozygosis and conformity to of Hardy-Weinberg balance on six studied SNP in gene *DMPK* are presented in table 1. Practically on all markers in all populations distribution of frequencies of genotypes corresponded to Hardy-Weinberg balance (an exception locuses *Dra III* and *Fnu 4HI* in population of kets and *HhaI*, *HphI* in population of Yakuts make). The least and greatest value of a heterozygosis was observed on different locuses in populations of kets, yakuts and the buryats.

Table №1

Frequencies of alleles studied locuses, the distribution of genotypes and heterozygosity in the studied samples

the researched group	of SNP in the DMPK gene	Frequency of minor allele	the observed heterozygosity (H_0)	expected heterozygosity (H_e)	Deviation of the X-B a χ^2 value
Patient MD (N=87)	DraIII(rs2070736)	0.276	0.526	0.4	-
	HhaI (rs572634)	0.093	0.107	0.169	-
	BpmI(rs1799894)	0.42	0.733	0.487	-
	Hph I (rs527221)	0.086	0.118	0.156	-
	Fnu4HI(rs915915)	0.207	0.28	0.328	-
	TaqI(rs10415988)	0.441	0.776	0.493	-
Yakuts (N=328)	DraIII(rs2070736)	0.381	0.495	0.472	0.4474
	HhaI (rs572634)	0.107	0.117	0.192	5.1128E-8(P<0.05)
	BpmI (rs1799894)	0.127	0.197	0.222	0.0961
	Hph I (rs527221)	0.188	0.265	0.305	0.0306(P<0.05)
	Fnu4HI(rs915915)	0.235	0.331	0.36	0.2041
	TaqI(rs10415988)	0.136	0.227	0.234	0.7221
Buryats (N=100)	DraIII(rs2070736)	0.355	0.41	0.458	0.3772
	HhaI (rs572634)	0.153	0.204	0.259	0.0889
	BpmI (rs1799894)	0.278	0.414	0.401	0.9985
	Hph I (rs527221)	0.035	0.07	0.068	1.0
	Fnu I (rs915915)	0.283	0.343	0.406	0.1846
	TaqI(rs10415988)	0.245	0.41	0.37	0.4503
Kyrgyz (N=100)	DraIII(rs2070736)	0.337	0.388	0.447	0.2571
	HhaI (rs572634)	0.18	0.237	0.296	0.1056
	BpmI (rs1799894)	0.347	0.49	0.453	0.601
	Hph I (rs527221)	0.174	0.284	0.287	1.0
	Fnu4HI(rs915915)	0.335	0.402	0.446	0.429
	TaqI(rs10415988)	0.308	0.434	0.426	1.0
Russian (N=100)	DraIII(rs2070736)	0.24	0.42	0.365	0.2261
	HhaI (rs572634)	0.137	0.232	0.236	1.0
	BpmI (rs1799894)	0.449	0.535	0.495	0.5752
	Hph I (rs527221)	0.143	0.245	0.245	1.0
	Fnu4HI(rs915915)	0.336	0.402	0.464	0.2497
	TaqI(rs10415988)	0.435	0.49	0.492	1.0

Khanty (N=100)	DraIII(rs2070736)	0.311	0.337	0.429	0.054
	HhaI (rs572634)	0.107	0.153	0.191	0.1466
	BpmI (rs1799894)	0.459	0.469	0.497	0.6949
	Hph I (rs527221)	0.071	0.121	0.131	0.7792
	Fnu4HI(rs915915)	0.402	0.392	0.481	0.0954
	TaqI(rs10415988)	0.474	0.392	0.499	0.049
Kets (N=50)	DraIII(rs2070736)	0.15	0.14	0.255	0.0131(P<0.05)
	HhaI (rs572634)	0.36	0.48	0.461	1.0
	BpmI (rs1799894)	0.33	0.42	0.442	0.9045
	Hph I (rs527221)	0.38	0.52	0.471	0.7213
	Fnu4HI(rs915915)	0.46	0.16	0.497	1.721E-6(P<0.05)
	TaqI(rs10415988)	0.32	0.44	0.435	1.0

The observed values of genetic diversity (FST) on the populations studied are presented in table 2. The greatest variety of populations recorded in russian, buryat and khanty, while the smallest - in the population of the yakut.

Table 2

Genetic differentiation of populations

The Population	The value of the FST
Yakuts (Centre, North, vilyui.)	0,00956
Kets	0,010763
Russian	0,10841
Kyrgyz	0,010831
Buryats	0,10946
Khanty	0,10855

The analysis of structure of a disbalance on coupling shown on two small blocks of coupling in populations of russian (in the extent on 4 kb, includes on 2 SNP: rs2070736 - rs572634 and rs1799894 - rs527221), and kets (on 4 kb, are located in goniometrical and centromere areas of a gene and include on 2 SNP: rs2070736 - rs572634 and rs915915 - rs10415988). One is not extended (to 4 kb) to the coupling block it is taped in populations of northern, central yakuts and kirgiz. More extended block (5 kb), including 3 SNP (rs572634 - rs799894 - rs527221) was observed in population vilusk yakuts. In group of sick blocks of coupling was not taped.

At paired comparison population samples on frequencies of alleles the most frequent significant differences are taped between populations of kets and the buryats (on all to six investigated locuses). Pairs of kets and khants, the buryats and russian significantly differed in frequencies of alleles on five locuses. At comparison of sick yakuts with population sample of

yakuts observed significant differences in frequencies of alleles on three locuses: *Hha I*, *Hph I*, *Fnu 4HI*.

Also in work have been taped and analyzed possible haplotypes in all studied samples on six locuses. 15 general haplotypes registered in pair patients DM – population sample of yakuts (table 3), most frequent of which (TTCCGA) met in this pair frequency 0,242. The least frequency of occurrence of the general haplotype TGCGGA – 0,01. On five haplotypes (TTCCGA, GTCCGA, TTTCTC, GTCCTA, GTTCTC) significant differences on frequency of occurrence were observed. All five haplotypes are associated with disease, and protective are haplotypes TTCCGA, GTCCGA, and contributing to disease – haplotypes TTTCTC, GTCCTA GTTCTC.

Table 3

Haplotypes and their frequencies and results of paired comparison of patients DM with population sample of Yakuts

Haplotype	frequency of haplotype		Value P
	patients (N=87)	test (N=328)	
TTCCGA	0,068	0,289	P<0.05
GTCCGA	0,040	0,250	P<0.05
TTTCTC	0,384	0,065	P<0.05
GTCCTA	0,130	0,054	P<0.05
TTCCTA	-	-	P>0.05
TTCGGA	-	-	P>0.05
TGCGGA	-	-	P>0.05
TGCGTA	-	-	P>0.05
GTCGGA	-	-	P>0.05
GTTCTC	0,049	0,004	P<0.05
TTTCGA	-	-	P>0.05
TTTCTA	-	-	P>0.05
TTTCGC	-	-	P>0.05
TTCCTC	-	-	P>0.05
TGCCGA	-	-	P>0.05

It should be noted that in our previous study of two Yakutian samples (patients and the DM population sample [2]), was detected on the same haplotype TTTCTC, indicating an association with disease, suggesting a significant role of this haplotype in susceptibility to myotonic dystrophy.

Conclusions

Analysis of a sample of patients myotonic dystrophy, the Yakuts, a sample of their healthy relatives and six North Asian population samples (yakuts, khanty, ket, russian, buryat and kyrgyz) for the six SNP, located evenly throughout the muscle protein gene (*DraIII* (rs2070736), *HhaI* (rs 572 634), *BpmI* (rs 1799894), *HphI* (rs 527 221), *Fnu4HI* (rs 915 915) and *TaqI* (rs10415988), revealed the presence of specific haplotypes associated with disease, the most significant of which is haplotype. Further work on the study of muscle protein kinase gene requires linkage of polymorphic sites search with the number of *CTG*-repeats in the *DMPK* gene in populations of Yakuts living in the Republic of Sakha (Yakutia).

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Kolesnichenko L.S., Batorova T.M., Subbotina T.D.

Glutathione system state at valproate sodium toxic action

Effect of antiepileptic preparation depakin on the lipid peroxide oxidation and glutathione system of rats and possibility of combined use of sodium valproate and antioxidant – immunocal were studied. Depakin injection causes a decreased antioxidant defense and oxidative stress development. Immunocal contributing to the intracellular glutathione synthesis has a protective influence.

Key words: glutathione system, lipid peroxidation, sodium valproate, immunocal.

Introduction. Epilepsy is one of the most common diseases of the nervous system which requires the use of specific anticonvulsive in its therapy. They should be taken for a long time, often during the whole life in quite large doses. Up-to-date antiepileptic preparations have some side effects. The basic antiepileptic preparations with wide action spectrum that may be used in different forms of epilepsy are valproates.

A number of articles report about hepatotoxicity caused by taking sodium valproate, they providing some data on development of acute toxic liver necrosis with fatal outcome [6,8].

Sodium valproate contributes to the accumulation of active forms of oxygen and decreased antioxidant defense. It consequently leads to the macromolecular oxidative modification, cell damage and death due to the oxidative stress development [3,5,7,9,11]. The basic of protection of cells against the damaging effect of the active forms of oxygen is glutathione system [1,2].

Consequently it seems advisable to study the possibility of combined use of sodium valproate and antioxidants.

The aim of study: to study the effect of antiepileptic preparation depakin separately and in combination with antioxidant immunocal on the lipid peroxidation, glutathione concentration (GSH) and the activity of its metabolism enzymes in the liver, kidneys, brain and erythrocytes of rats.

Materials and methods. Experiments on 56 not pedigree rats of both sexes with a weight of 190-210g. were performed. The rodents were taken from the arboretum of the Angarsk research institute of labor medicine and human ecology SB RAMS. The animals were divided into 5 groups: the first group was a control one, the rest received depakin into the stomach in a toxic dose of 600 mg/kg a day for different periods: 14 and 28 days separately and in combination with immunocal. Immunocal was injected into the stomach in a dose of 285 mg/kg a day. For the analysis the liver, kidneys and brain supernatant prepared by conventional methods was used, and for the determination of glutathione system indices in the erythrocytes the blood sampling from the heart was made. The study was performed following the international standards and bioethical norms in accordance with “the International recommendations on the biomedical investigation with the use of animals” adopted by CIOMS in 1985 and approved by the Local ethical committee in may, 19, 2010.

Restored glutathione concentration (GSH) and its metabolism enzymes activity: glutathione transferase (GT), glutathione reductase (GR), glutathione peroxidase (GPO) and gamma-glutamyl transferase (GGT) were studied by the standard spectrophotometric methods [4]. Measuring of TBA-active products as markers of the lipid peroxidation was performed by J. Stocks’ method [10]. All the results were statistically worked up with the use of Student’s criteria F, t and Welch’s criterion t. Only significant changes ($p < 0,05$) were described.

Results and discussion. The received data showed that depakin injection causes expressed oxidative stress of the lipids peroxidation (high concentration of TBA-active products in the liver, kidneys and erythrocytes, low GSH concentration in the liver and kidneys and high GGT activity in the liver). During 14 days after depakin injection TBA-active products concentration increased at 127% in the liver, at 232% in the kidneys at 95% in the erythrocytes

(table 1); GSH concentration decreased at 21% in the liver, at 14% in the kidneys and increased at 13% in the erythrocytes (table 2). Depakin injection during 28 days was accompanied by the increased TBA-active products concentration at 262% in the liver, at 279% in the kidneys, at 145% in the erythrocytes; decreased GSH concentration at 23% in the liver, at 40% in the kidneys, and at 13% in the erythrocytes. Revealed GSH deficiency can be evidence of weakened antioxidant system in general and serve the earliest index of oxidative processes increase of TBA-active products shows that depakin injection is accompanied by the signs of active oxidative stress.

GGT catalyzes γ -glutamyl residue transport on the nucleophil acceptors, thus decreasing GSH concentration. Increase of GGT activity in the liver at 41% well correlates with the decrease of GSH concentration in the liver. However, it is not characteristic of other tissues: in the kidneys GSH concentration and GGT activity decrease, in the brain GGT activity increases, but GSH concentration doesnot change. After sodium valproate injection expressed changes in the activity of antioxidant defense enzymes in rats are revealed. GR activity increases at 108% in the liver for 14 days, in the kidneys at 100% and 33% for 14 and 28 days, in the erythrocytes it decreases at 57 and 63%. GT activity decreases in the liver at 23 and 27%, in the erythrocytes at 45 and 64%, decreases in the kidneys at 51% for 28 days, in the brain at 52% for 14 days. GPO activity increases in the liver at 71% for 28 days, decreases in the erythrocytes at 238% for 28 days, decreases in the kidneys at 29% for 14 days (table 3).

Increased TBA-active products concentration against decreased GSH concentration, GR and GT activity shon expressed oxidative stress. Increased GPO activity in the liver and erythrocytes can be considered a favourable sign.

Immunocal injection normalizes change of GSH concentration in the liver and kidneys for 14 days, lowers its decrease from 23% to 18% for 28 days in the liver, and raises its decrease at 18 and 46% for 14 and 28 days (table 2). TBA-active products concentration in the liver and kidneys becomes normal for 14 days, in the liver it becomes normal for 28 days, in the kidneys it significantly decreases since the increase comprises 105% instead of 279%; in the erythrocytes – 35% increased of 95% for 14 days, 93% increased of 145% for 28 days (table 1). GGT activity becomes normal in the liver and brain, remains decreased but becomes less expressed in the kidneys. GR activity in the liver and kidneys becomes normal for 14 days, increases at 53% in the liver for 28 days, at 31% in the kidneys, at 32 and 73% in the brain, and at 94 and 167% in the erythrocytes. GT activity becomes normal in the liver, kidneys and brain, and becomes less decreased in the erythrocytes. GPO activity in the kidneys and brain becomes normal, in the liver and erythrocytes it remains increased but less expressed (table 3).

Conclusion

1. Depakin injection causes expressed oxidative stress accompanied by the active process of lipid peroxidation (high concentration of TBA-active products in the liver, kidneys and erythrocytes) and low GSH concentration, it is intensified by high GGT activity and low GT activity.
2. The combined use of immunocal and depakin was revealed to prevent lipid peroxidation activation in the liver and kidneys for 14 days, normalize GSH concentration in the liver, kidneys and brain, decreasing it in the erythrocytes.
3. 28 days after combined use of immunocal and depakin the oxidant and antioxidant systems impairments caused by depakin become less expressed.

Table 1

TBA-active products and GSH concentration after depakin injection separately and in combination with immunocal

Preparation	Liver	kidneys	erythrocytes
Control (14)	0,026 ± 0,007	0,019 ± 0,004	0,040 ± 0,002
Depakin 14 d (16)	0,059 ± 0,007**	0,063 ± 0,004***	0,078 ± 0,008***
Depakin 28 d (9)	0,094 ± 0,019**	0,072 ± 0,018*	0,098 ± 0,007***
Im + D 14 d (7)	0,020 ± 0,003 ^c	0,021 ± 0,002 ^c	0,054 ± 0,003**, ^a
Im + D 28 d (10)	0,034 ± 0,001 ^b	0,039 ± 0,001***	0,077 ± 0,009**

Note (here and further): in brackets the number of rats in experiments; significance of differences with control: * – $p < 0,05$, ** – $p < 0,01$, *** – $p < 0,001$; significance of differences between series: a – $p < 0,05$, b – $p < 0,01$, c – $p < 0,001$. TBA-active products concentration in units of extinction, GSH concentration is expressed in mmole per gram of tissue.

Table 2

GSH concentration after depakin injection separately and in combination with immunocal

Preparation	Liver	kidneys	brain	erythrocytes
Control (14)	$5,74 \pm 0,13$	$2,87 \pm 0,12$	$2,17 \pm 0,09$	$1,99 \pm 0,03$
Depakin 14 d (16)	$4,51 \pm 0,09^{***}$	$2,48 \pm 0,12^*$	$2,07 \pm 0,12$ (6)	$2,24 \pm 0,08^*$
Depakin 28 d (9)	$4,44 \pm 0,28^{***}$	$1,72 \pm 0,08^{***}$	$1,71 \pm 0,30$	$1,74 \pm 0,10^*$
Im + D 14 d (7)	$5,53 \pm 0,08^c$	$2,61 \pm 0,08$	$2,01 \pm 0,24$	$1,68 \pm 0,11^{*,c}$
Im + D 28 d (10)	$4,73 \pm 0,03^{***}$	$2,93 \pm 0,03^c$	$2,21 \pm 0,07$	$1,07 \pm 0,09^{***,c}$

Table 3

Dynamics of changes in enzymes activity in the liver, kidneys, brain and erythrocytes of rats after depakin injection.

Preparation		Control	Depakin 14 d (16)	Depakin 28 d (9)	Im + D 14 d (7)	Im + D 28 d (10)
liver	GR	15,4±1,02	32,0±1,09***	16,2±1,05	17,1±0,10 ^c	23,5±1,17*** ^c
	GT	307±28,9	236±15,9*	224±14,4*	287±3,10 ^b	269±2,03 ^b
	GPO	85,0±5,86	96,7±10,2	145±12,9***	93,8±0,28	127±0,13***
	GGT	1294±132	1181±94,0	1825±91,5**	1314±48,1	1474±29,5 ^b
kidneys	GR	23,0±1,82	46,0±2,98***	30,7±2,38*	27,1±2,03 ^c	30,1±1,67*
	GT	154±18,1	189±15,4	232±20,9**	162±3,11	169±2,08 ^b
	GPO	110±8,11	78,5±5,83 **	139±19,8	119±3,96 ^c	127±4,02
	GGT	158±2,98	97,1±7,41 ***	171±11,5	127±2,07** ^b	126±1,56*** ^b
brain	GR	14,9±1,03	12,4±1,37	18,3±2,18	19,7±0,92** ^c	25,8±0,53*** ^b
	GT	183±19,1	279±22,3**	215±13,9	197±9,95 ^b	203±5,76
	GPO	45,0±2,77	51,0±4,79	73,8±16,8	49,8±1,26	50,3±2,21
	GGT	3029±311	4209±397*	4588±577*	3314±49,7 ^a	3242±31,4 ^a
erythrocytes	GR	7,38±0,10	3,19±0,13***	2,71±0,03***	14,3±0,68*** ^c	19,7±1,46*** ^c
	GT	29,7±0,49	16,3±0,16***	10,6±0,09***	24,5±2,03* ^b	23,1±1,08*** ^c
	GPO	103±8,17	127±13,0	348±19,0***	148±23,6	274±28,1*** ^a
	GGT	1604±32,4	1875±39,8***	2146±34,0***	1004±31,9*** ^c	1197±46,0*** ^c

Note: In the table the GR, GT and GPO activity is expressed in nmole/min per 1 mg of protein; GGT activity in the liver, brain and erythrocytes is expressed in nmole per 1 mg of protein, that in the kidneys – in mmole per 1 mg of protein.

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Information on authors:

Kolesnichenko Larisa Stanislavovna – Professor, MD, head of the Chemistry department SEE HE ISMU Ministry of Public Health and social development of Russia, 664003 Irkutsk, Krasnogo Vosstaniya str., 1, Chemistry department ISMU, Tel.(3952)243825, E-mail: kolesnichenkols@mail.ru

Batorova Tatiana Matveevna – post-graduate of the Chemistry department ISMU, Tel.89027614869, E-mail: batorovat@mail.ru

Subbotina Tatiana Dmitrievna – 2-year student of the medical department ISMU.

S. A. Vaitiuk¹, A. I. Zmitrovich²

**MAIN EPIDEMIOLOGIC ASPECTS OF CENTRAL NEURAL SYSTEM TUMORS OF
CHILDREN POPULATION IN REPUBLIC OF BELARUS**

¹ International Sakharov Environmental University

² Belorussian Center of Pediatric Oncology and Hematology

Abstract

Epidemiological research in the field of oncology pediatry has huge importance for understanding the reasons of development and spread of CNS tumors on Republic of Belarus and other countries. Also incidence rate for gender and sex patterns, children CNS tumor rate in Belarus are considered. Results of relative epidemiological risk are calculated.

Key words: children, tumor, CNS, incidence, relative epidemiological risk.

Information and research methods

The study covers the period from 1999 to 2009, for which in the Republic of Belarus there were RB cases of children neoplasms aged from 0 to 14 years. Source of information about patients with CNS tumors is the children's cancer-subregister the Republic of Belarus, created at the National Scientific and Practical Center of Pediatric Oncology and Hematology. Based on the data of the register own database has been created using the software product Microsoft Excel 2010. Rough intensive morbidity was calculated per 100000 children population of corresponding sex and age.

Calculation of coefficients of relative epidemiological risk (RER) for each year of the period from the fifth in ordinal terms, was done according to the following steps:

1. Calculation of baseline rate ($C_{bsl.}$), which is equal to the arithmetic value of three minimal morbidity rates over a five years period.
- 2 Calculation of deviation (t) of actual incidence rate of the test year ($C_{act.}$, incidence of the fifth year of the period) of baseline:

$$t = \frac{|C_{bsl.} - C_{act.}|}{\sigma}, \quad \text{where } \sigma = 1,96$$

3. According to the integral function table, the degree of epidemiological risk was defined. According to the calculated t-criteria (c. 2) conclusion about risk value is done (RER).

While processing the information that characterizes the incidence of children CNS tumors distribution by sex and age (0-4, 5-9; 10-14 years), location (urban, rural), by year, was obtained.

Results and discussion

During the period from 1999 to 2009 according to recent information of children cancer-subregister of the Republic of Belarus (National Research Center for Pediatric Oncology and Hematology) it was identified 536 cases of CNS tumors in children aged 0 to 14 years by 29.12.2010.

According to the International Classification of children cancer the third revision (ISSC-3), all CNS tumors are classified depending on the morphological and topographical code ICD-O III in the following nosologic forms: a) ependymomas, b) astrocytoma, c) Primitive neuroectodermal tumors, d) other gliomas, e) other intracranial and intraspinal updated neoplasm, f) other unspecified intracranial and intraspinal neoplasm.

The structure of children CNS tumors incidence in Belarus is dominated by astrocytic tumors - 40,0% ($n = 129$), ependymary tumors is 8,6% ($n = 46$), primitive neuroectodermal tumor - 22,2% ($n = 119$), other gliomas - 11,3% ($n = 61$), other intracranial and intraspinal updated neoplasms - 9,32% ($n = 50$), other unspecified intracranial and intraspinal neoplasm - 8,6% ($n = 46$).

Among newly diagnosed children, there were 299 boys (55.8%) and 237 girls (44.2%). Male/female ratio is 1.26 /1. In most cases, for all years of the study period the number of records for boys higher than girls, except for 2003 and 2005, when the girls got sick more. For childhood, the incidence rate ranged from 0.76 to 6.54 in 2006. The greatest incidence was in 2000 ($3,64 \pm 0,44$) and 2007 ($3,61 \pm 0,50$). Among the sick children during the studied period the highest incidence rates occur in the age of 1 year ($3,86 \pm 0,20$), 6 years ($3,66 \pm 0,19$) and 7 years ($3,64 \pm 0,18$).

Among the cases during the studied period, the biggest number is children aged 10-14 years - 190 people (35.4%), followed by the children of 5-9 years - 179 people (33.4%), then children aged 0-4 year - 167 people (31.2%).

The largest number of cases of CNS tumors reported in children living in Belarus ($n = 97$), then descending in Brest ($n = 92$), Gomel ($n = 79$), Grodno ($n = 74$), Minsk ($n = 67$), Vitebsk ($n = 60$) and Mogilev ($n = 59$) regions. The analysis of morbidity in children, depending on place of residence (urban or rural). Sick children in rural areas have been identified 155, in the city - 381.

Relative epidemiologic risk (RER) for the period 1999 - 2009 is calculated to determine the risk age. The coefficient of relative epidemiologic risk ranged from 0.0008 (corresponds to a minimal degree of risk) to 2.45 (corresponding to the degree of high-risk). But the greatest values of the dangerous risk is in the age group 0-4 years, for the first time the risk age was identified. Hence, we can conclude that this age group is more susceptible to the action of negative factors, which subsequently cause the emergence of this disease. Age group 0-4 years, according to the value of the coefficient of RER is "a group of follow-up" and be more thorough examination and observation to identify sick children at an early stage of the disease that is characterized by the absence of a clear clinical picture, the long latent period of the disease, the specific localization feature of tumor growth.

Conclusions:

1. For the period 1999-2009 in the Republic of Belarus is registered 536 children with CNS tumors, from 34 to 57 cases per year.
2. The incidence of CNS tumors for eleven-year period is 2.9 per 100 000 children population from 0 to 14 years. The boys got sick more frequently than girls (b: g = 1,26:1).
3. The highest incidence rate is registered for patients aged 10-14 years.
4. Of all CNS tumors of Belarus children dominates astrocytoma - 40,0% ($n = 129$) and primitive neuroectodermal tumor - 22,2% ($n = 119$).
5. The largest number of cases registered in Minsk ($n = 97$) - 3.43 per 100 000 children population.
6. The highest values of RER occur in the age group of 0-4 years. Thus, for the first time there is a group of follow-up with an increased risk for this disease.

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Authors' data:

1. Svetlana Anatolevna Vaitiuk, P.G. of A.D. Sakharov ISEU
Republic of Belarus, Minsk, Esenina 42/41, tel.: +375 29 76 73 880. E-mail: teta_k@tut.by
2. Anfisa Ivanovna Zimitrovich, head of Department of clinic-epidemiologic analysis of “Belorussian Center of Pediatric Oncology and Hematology”.
Republic of Belarus, 223040, Minsk region, v. Lesnoe, tel.: +375 (017) 265 40 48.

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LI Mordovskaya¹, MA Vladimirskii², LK Shipina², EI Aksenova³, AYu Sazykin⁴

Quantitative assessment of tumor necrosis factor induction by the whole blood cells ex vivo, in the presence of Mycobacterium tuberculosis antigens

1 – State Institution “Research-Practice Center ‘Phthisiatry’”, Ministry of Health, Sakha Republic (Yakutia); 2 – Research Institute of Phthisiopulmonology, I.M. Sechenov First Moscow State Medical University (MSMU); 3 – Gamaleya Research Institute of Epidemiology and Microbiology, Russian Academy of Ministry of Health and Social Development of Russian

Federation; 4 – Belozersky Research Institute of Physico-Chemical Biology, Lomonosov
Moscow State University.

We studied an efficacy of whole-blood method of tumor necrosis factor-alpha (TNF-alpha) induction in the presence of Mycobacterium tuberculosis antigens (tuberculin PPD and a mixture of specific recombinant ESAT-6 and CFP-10 antigens), for differential diagnosis of active tuberculous infection. A customized test system with immunoenzyme assay was developed, to quantify TNF-alpha in plasma samples. Based on findings of blood sample investigations in 46 adolescents with tuberculous infection (latent infection) and active pulmonary tuberculosis, the study demonstrated the possibility of differentiation between active and latent tuberculous infection, using ESAT-6 and CFP-10 antigens as TNF-alpha inducers.

Keywords: children, adolescents, tuberculosis, tumor necrosis factor, antigens

INTRODUCTION

The purposes of the use of immunodiagnostic methods in the field of tuberculosis (phthisiatry) are: diagnosis and differential diagnosis of tuberculosis, precise determination of the extent of tuberculosis activity, differentiation between postvaccinal and infectious allergies, and monitoring of the treatment efficacy and prediction of the disease course and outcome.

Reactivation of tuberculous infection seen in patients with rheumatoid arthritis during the treatment with Infliximab (trade name Remicade) humanized monoclonal antibodies is a vivid demonstration of the importance of TNF-alpha in the execution of antituberculosis immunity [3]. TNF is responsible for the formation and maintenance of granuloma that restricts the spread of tuberculous infection [4]. But, apparently, TNF-alpha is involved into the antimycobacterial resistance through a far more complex mechanism. $CD8^+CD45RA^+$ effector T-cells that ensure granulysin-mediated lysis of mycobacteria-infected macrophages have been shown to carry TNF-alpha molecules on their cell membranes. And this implies the lysis of these cells and blockade of the antimycobacterial effect by anti-TNF-alpha antibodies via the complement system [1]. Levels of antigen-stimulated TNF-alpha, unlike the levels of IFN-gamma, are not depressed in pulmonary tuberculosis with an extensive disease process [2], with the higher concentrations during active tuberculous infection, then during latent infection [8].

So the aim of the present work was to analyze the antigen-stimulated production of TNF-alpha in whole blood during different forms or phases of tuberculous infection, and during pulmonary diseases of a non-specific nature as well.

Materials and methods. The following groups of adolescent patients aged 14 to 17 have been studied (n=46): 8 patients with primary MTB infection (tuberculin test conversion); 10 patients with less than 2 years back history of recent MTB infection, adolescents with positive

Mantoux test; 20 patients with active pulmonary tuberculosis; 8 patients with localized forms of tuberculosis in the solidification and calcification phase.

Determination of antigen-stimulated TNF-alpha production. The whole blood for analysis was obtained in specimens of 3.5 mL each, with 20 U/mL of heparin, which were distributed to 3 tubes (5-mL sterile screw-top cryotubes), 1 mL per tube. One of the tubes was used as control, each of the 2nd and the 3rd tubes contained 10 mcL of PPD antigen or a mixture of ESAT-6 and CFP-10 recombinant antigens, respectfully. The antigens were added in doses of 10 µg protein. The percentage of specific recombinant peptides binding to cellulose-binding domain in the total pool of antigens added was nearly 20%.

An immunoenzymometric test system was developed to quantify TNF-alpha in supernatant plasma of the samples after whole blood incubation. Polyclonal rabbit antibodies produced by five-fold (at an interval of 2 weeks) immunization of rabbits with recombinant human TNF-alpha were added as a sorbent to the wells of polystyrene plates. Rabbit IgG were prepared by means of affine chromatography, using 'Protein A Sepharose FF' column. Direct ELISA titers of anti-TNF-alpha antibodies were shown to be at least 1:200 000. Anti-TNF-alpha F10 monoclonal antibodies [6], labeled with biotin and purified by 'Protein A Sepharose FF' column, were used as the detecting antibodies. Detection was made using streptavidin-peroxidase (Sigma), with orthophenylenediamine (OPDA) as a substrate for peroxidase.

Calibration curve was built based on consecutive double dilutions with standard recombinant TNF-alpha at concentrations ranging from 23.3 ng/mL to 0.05 ng/mL. 50 µL of diluting liquid and 50 µL of plasma samples were added to the wells on repeats.

Quantitative measurement of the responses was done using a 'Pikon' ELISA analyzer (Russia).

Assay sensitivity was 0.09 ng/mL. TNF-alpha levels in all antigen-stimulated samples were measured to be significantly higher than the test system sensitivity level.

Statistical assessment of inter-group differences was made by means of SPSS software with the use of a parametric Student's t-test and a nonparametric Wilcoxon test.

Results and discussion. Study results on antigen-stimulated TNF-alpha production in 46 adolescent patients are presented in Table 1.

According to the findings (Table 1), adolescents with suspected primary MTB infection had significantly higher levels of PPD-stimulated TNF-alpha concentration, then patients with recent infection or effectively treated patients with relatively minor forms of tuberculosis (primary tuberculous complex; infiltrating pulmonary tuberculosis, not extending beyond a single segment, in solidification phase). Similar findings between these forms of tuberculosis infection

were seen when TNF-alpha production was stimulated by a mixture of ESAT-6 and CFP-10 antigens, but the findings showed also that the levels of induced TNF-alpha were significantly higher in patients with active pulmonary tuberculosis (6.2 ± 0.6 ng/mL) than in patients with primary infection (3.0 ± 0.3 ng/mL).

Table 1.

TNF-alpha induction in whole blood samples incubated with MTB antigens

Patient groups	TNF-alpha concentration, ng/mL			
	Tuberculin PPD	p	Mixture of ESAT-6 and CFP-10 antigens	p
1. Newly identified MTB infection, n=8	3.8 ± 0.6	$p_{1-2} < 0.01$	3.0 ± 0.3	$p_{1-4} < 0.01$
2. Recent MTB infection, n=10	0.8 ± 0.2		1.4 ± 0.2	$p_{1-2} < 0.01$
3. Active pulmonary tuberculosis, n=20	3.85 ± 0.6	$p_{3-4} < 0.05$	6.2 ± 0.6	$p_{1-3} < 0.01$ $p_{3-4} < 0.001$
4. Minor forms of tuberculosis in solidification and calcification phase, n=8	1.45 ± 0.28	$p_{2-4} < 0.05$	2.2 ± 0.3	$p_{2-4} = 0.02$

The presented data indicate, that the level of TNF-alpha production in response to antigen stimulation reflects the activity of tuberculous infection. TNF-alpha was induced at very high levels in patients with fibrotic-cavitary pulmonary tuberculosis (14.1 ng/mL), and in patients with infiltrating tuberculosis concurrent with exudative pleuritis (9.13 ng/mL). Patient A, who had an infiltrating pulmonary tuberculosis concurrent with rheumatoid arthritis and was receiving Remicade (Infliximab) – a medication containing specific anti-TNF-alpha antibodies – although developed some observable TNF-alpha in response to PPD and a mixture of ESAT-6 with CFP-10, but at low concentration levels: 0.25 ng/mL and 0.6 ng/mL, respectfully.

The possibility of differentiation between latent and active infection based on TNF-alpha induction using PPD tuberculin as a stimulator, has been first demonstrated by Stern J.N. et al. [8].

Our findings, indicating the presence of significant differences between patients with active tuberculosis disease and non-active tuberculosis forms, correlate with the recently published reports by several authors [2, 5, 7-9] who found that differences exist between active and latent tuberculous infections, and that antigen-stimulated production of TNF-alpha decreases with effective treatment and mycobacterial expectoration cease. It is clear, that a very important set of data that will help to assess the clinical course and predict the outcome can be provided by immunological monitoring, such as the assessment of a specific immune response during disease and treatment, using a customized test system that would enable assessment of antigen-stimulated production for a number of cytokines.

We noticed, that levels of antigen-stimulated TNF-alpha remained high in patients who completed the intensive treatment phase, and a number of patients from non-active tuberculosis group who had profound residual effects after tuberculosis likewise had higher levels, compared to the rest of their group.

In fact, the development of a similar novel laboratory approach suitable for wide-scale clinical practice is required in surveillance for possible activation of tuberculous infection in HIV-infected patients with post-tuberculosis effects in the lungs. In this respect, a Luminex method could be a prospective automated technique for determination of cytokines, including TNF-alpha, in the antigen-stimulated blood samples, that could substantially improve the efficacy and specificity of this approach used for control of tuberculous infection.

Conclusions. The study results indicate that an ex vivo determination of antigen-stimulated tumor necrosis factor-alpha in whole blood samples can be used in diagnosing the tuberculous infection with the purposes of:

- differentiation between active or latent tuberculous infection;

- immunological assessment of the extent to which the disease is cured;
- differential diagnosis of tuberculosis and non-specific lung diseases.

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4. Minor forms of tuberculosis in solidification and calcification phase n=8	1.45 ± 0.28	p ₂₋₄ <0.05	2.2 ± 0.3	p ₂₋₄ =0.02

Authors:

1. Mordovskaya Larisa Ivanovna – MD, senior researcher, State Institution “Research-Practice Center ‘Phthiatriy’ ”, Ministry of Health, Sakha Republic (Yakutia); Yakutsk; e-mail: limordovskaya@mail.ru.
2. Vladimirkii Mikhail Alexandrovich – MD, Professor, Head of the Molecular diagnostics laboratory, Research Institute of Phthiopolmonology, I.M. Sechenov First Moscow State Medical University (MSMU); Moscow
3. Shipina Liubov’ Klimovna – Candidate of Biological Science, senior researcher, Molecular diagnostics laboratory, Research Institute of Phthiopolmonology I.M. Sechenov First Moscow State Medical University (MSMU); Moscow
4. Aksenova Ekaterina Ivanovna – researcher, Nanostructures laboratory, Gamaleya Research Institute of Epidemiology and Microbiology, Ministry of Health and Social Development of Russian Federation; Moscow
5. Sazykin Aleksei Yurievich – Candidate of Biological Science, associate professor, Department of Immunology, Belozersky Research Institute of Physico-Chemical Biology, Lomonosov Moscow State University.

THE PERSPECTIVE OF PROGNOSING THE EXTENT OF ADHESIONS IN PATIENTS AFTER ABDOMINAL OPERATIONS

The resume

In this work diagnostic capability of N-acetyltransferase in prognosing the extent of possible adhesions in the abdominal cavity in the early postoperative period is presented. It was established that in the postoperative period the level of N-acetyltransferase was increased in the urine of patients compared with the preoperative period. The difference between levels of enzyme in patients where operative treatment was accompanied by the greatest injury is especially expressed.

Keywords: forecasting, N-acetyltransferase, formation of adhesions.

Despite the advances and progress of modern medicine, adhesive disease is currently still one of unsolved and actual problems of surgery. The frequency of the adhesive disease, difficulties of early recognition, absence of clear criteria for treatment strategy with unsatisfactory outcomes make the problem of adhesion syndrome always actual [2, 6, 7, 8, 9]. In the last decade a lot of methods of diagnostic of adhesive disease were suggested, but all of these methods are relative and primarily directed to recognition, but not prediction of pathology. This does not allow the surgeon with great caution to conduct prevention activities of formation of abdominal adhesions in the early postoperative period.

Recently the study of the pathogenesis of intraperitoneal adhesions revealed that fibrillogenesis of connective tissue is mainly determined by genetically-determined polymorphism of the phenotype of N-acetyltransferase, which transfers an acetylic group from the acetylsym's molecule to a primary amino group of various substrates, including glucosamine and galactosamine, and its main function is acetylating of metabolic products.

N-acetyltransferase is a constitutive enzyme, the activity in the body which people are divided into two groups: those with a phenotype of rapid and slow acetylation.

Cellular and fibrous components of connective tissue are embedded in the extracellular basic substance – proteoglycans, the metabolism of which is determined by the N-acetyltransferase enzyme. Research by Gladkikh S. P., 1984, and Magalashvili R. D., 1982, proved that people with rapid acetylation phenotype the biosynthesis of the extracellular component of connective tissue predominates over its catabolism, i. e. the formation of adhesions prevails over the process of their lysis. When applied to such patients injured in the abdominal cavity a pronounced adhesive perivisceritis was developing. Conversely, people with a phenotype of slow acetylating the biosynthesis of extracellular component of connective tissue compared to its catabolism are slow. When applied to abdominal trauma in this patients the adhesion process are small or absent [2, 3]. Thus, by the Gladkikh SP 1984, Podymov VK 1979 determined, that one cause of increased tendency to adhesion formation is acetylating activity of the body, damage of the peritoneum, the operation, inflammation are non-specific permissive factor, such as “trigger” of excessive biosynthesis of the extracellular component of connective tissue [1, 5]. With the results of these studies we can with most likely assume that the adhesive perivisceritis in the abdominal cavity is a distinct disease, genetically determined by the constitutive enzyme N-acetyltransferase, and a main role in abnormal development of connective tissue in the abdominal cavity belong to this enzyme.

The purpose of our study is identification of correlations the activity of N-acetyltransferase among operated patients depending on the traumatism of operation and severity of adhesive process in the abdominal cavity in the early postoperative period.

Materials and methods

The study was conducted on 23 patients admitted to the surgical department of Blagoveshchensk City Hospital for the planned surgical treatment. Age of patients ranged between 31 and 72 years. Among all patients women were 18 (60,86 %), men – 9 (39,14 %).

65,21 % of patients had surgical operations in anamnesis, in 34,79 % - anamnesis without surgical operations.

The group consists of patients with predisposed to adhesive formations. The predisposed to adhesive formation was determined by the Prebsting's method, modified by A. M. Timofeeva, 1971, which based on determination of N-acetyltransferase level in urine [4].

Among the total number of patients, 16 patients were operated in the amount of laparotomy with hernioplasty of postoperative ventral hernias, and 7 patients were operated in the amount of laparotomy with cholecystectomy for chronic calculous cholecystitis.

For determining of difference between the levels of N-acetyltransferase before operations and after operations in all patients was investigated activity of N-acetyltransferase at the 3rd day of postoperative period.

For performing of acetylating reaction used method of determining free and acetylated streptocide in six-hour urine sample after a single oral dose of the drug test. Test dose is shown in Tab. 1. In the test tube with 0,2 ml of urinal fluid added 2 ml of 15 % solution of trichloroacetic acid, 1 ml of 7 % solution of hydrochloric acid, then 6,8 ml of distilled water. The tube was centrifuged during 10 minutes. The supernatant solution was poured into two 2,5 ml-tubes (tube 1 and tube 2).

For determine the free streptocide in tube 1 add 0,1 ml of 0,5 % NaNO_2 , after 10 minutes – 1,5 ml of a saturated solution of trihydrate sodium acetate and 0,25 ml of resorcinol, exposure – 15 minutes. In the control tube instead of the supernatant fluid using 2,5 ml of distilled water. Content of tube 1 was examined by photocalorimetry, the scale is set to 0 by control tube.

For determine the total streptocide in a test tube 2 was added 0,25 ml of 7 % hydrochloric acid solution and placed in a water bath for 30 minutes, after cooling add 0,1 ml of 0,5 % solution of NaNO_2 , exposure 10 minutes. Then add into 1,5 ml of sodium acetate and 0,25 ml of resorcinol, exposure 15 minutes. In the test tube these drugs mixed with 2,5 ml of distilled water in the same sequence. The sample is examined by photocalorimetry, scale is set to 0 by the control tube (5 mm-cuvette, wavelength – 490 nm).

The percent of acetylating was calculated by the formula $K = (O - \Gamma) / O \times 100 \%$ (K – the percentage of acetylating, O – the rate of total streptocide, Γ – an indicator of free streptocide). The study approved by the Committee of Biomedical Ethics of ASMA (protocol # 5, Jan. 21, 2010).

Results and discussion

All of patients with abdominal surgical operations in anamnesis (65,21 %) during laparotomy intra-abdominal adhesions were found.

6 patients had viscero-parietal adhesions mainly in the ileum's region, without visual deformation of intestinal tube. 9 patients had viscero-parietal adhesions with adhesions of the greater omentum with postoperative scar. 7 patients had deformations of small intestine due to intra-abdominal adhesions. In all of the above cases, the dissections of intraperitoneal adhesions were performed.

Postoperatively, in all patients wounds healed with primary intention, symptomatic therapy due to main disease.

At 3 days of postoperative period in all patients the level of N-acetyltransferase activity in the urine by the above methods were studied.

Statistical processing of the results of the study was performed using Statistica 6.0 software. Differences in the comparing groups was considered at a significance level of 95 % ($p < 0,05$).

The obtained data are expressed in percentages.

Analyzing the results (presented in the chart 1) the increasing of N-acetyltransferase activity by an average of 13 % in the postoperative period was found. Particularly high enzyme activity was observed in patients where surgery was accompanied by the greatest injury.

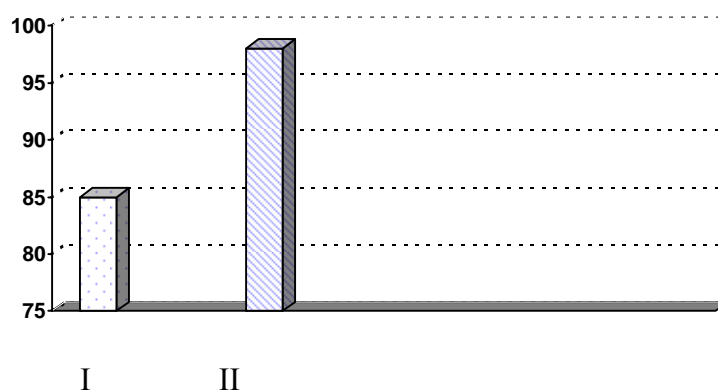
All patients were discharged from the hospital after 9 – 11 days in satisfactory condition for ambulatory treatment.

Thus, obtained data shows that during postoperative period the activity of the N-acetyltransferase in the body were increased, with the highest levels of the enzyme in patients, where operation was accompanied by a massive injury. The observed phenomenon is likely to be associated with the participation of this enzyme in the synthesis of connective tissue formed part of the intraperitoneal adhesions.

Our research provides preconditions to further deeper study of correlation between the change of level of the activity of N-acetyltransferase in the body and the degree of formation of intraperitoneal adhesions.

Conclusions

1. The significant increase of N-acetyltransferase activity in urine of tested patients during postoperative period is found clinically.
2. The highest level of enzyme activity in patients with established where surgery was accompanied by the greatest injury.
3. Considering the literature data of the important role of N-acetyltransferase in the formation of connective tissue, we consider, that increasing level of activity of this enzyme in the postoperative period can be prognostic sign of progression of adhesion formations in the abdominal cavity.



Pic. 1 Average correlation level N-acetyltransferase in the urine of patients with pre- and postoperative period, in percentage terms. Indicated by the horizontal average level of N-acetyltransferase: I - preoperative period, II - postoperative period.

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A.P.Petrov, M.M.Vinokurov

**THE TACTICS CHOICE OF SURGICAL TREATMENT OF PATIENTS WITH THE
ACUTE CHOLECYSTITIS COMPLICATED BY CHOLEDOCHOLITHIASIS AND
OBSTRUCTIVE JAUNDICE**

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We have used the improved estimation card of physiological condition severity for the objective evaluation of physiological condition severity of patients with acute cholecystitis complicated by choledocholithiasis and obstructive jaundice. This card has 39 risk factors, each of which corresponds to certain points. The patients are subdivided into 4 categories by physiological condition severity by points summing of factors of operational risk. The algorithm of treatment was developed for each category of physiological condition severity and the predicted outcome depending on the form of acute cholecystitis. The improved medical tactics showed the decrease of postoperative complications to 16,5 % and postoperative lethality rate to 4,7 %.

Keywords: acute cholecystitis, choledocholithiasis, obstructive (mechanical) jaundice, cholecystectomy.

Vinokurov Mikhail Mikhailovitch – PhD (Medicine), professor, department head of Medical Institute, North-Eastern federal university named after M.K.Ammosov, e-mail: mmv_mi@rambler.ru;

PETROV Alexander Petrovitch - surgeon of I surgical department of Republic hospital №2, post-graduate student of NEFU, e-mail: APPetrof73@rambler.ru;

Introduction. Surgical treatment of acute cholecystitis complicated by choledocholithiasis and obstructive jaundice is one of the most actual problems in modern surgery. It is connected firstly with the disease spreading, unsatisfactory results of surgical treatment and high percent of postoperative complications and lethality rate [7]. New hi-tech diagnostic methods and minimally invasive surgical interventions reducing risk of operation and expanding possibilities of surgical treatment were successfully approved and introduced in

clinical practice [1, 2, 3, 6]. Despite rapid development of diagnostic and surgical technologies, they are often used irregularly giving different results. Nowadays doctors have no common opinion concerning optimum treatment tactics of acute cholecystitis complicated by choledocholithiasis and obstructive jaundice [4, 5, 8].

The thesis aim was the results improvement of surgical treatment of patients with acute cholecystitis complicated by choledocholithiasis and mechanical jaundice, by improved medical tactics on the basis of the integrated estimation of physiological condition severity with the endoscopic and minimally invasive operations.

Materials and methods. Our work was based on the analysis of the results of surgical treatment of 127 patients with acute cholecystitis complicated by choledocholithiasis and mechanical jaundice from the surgical department of Republic hospital №2 - Yakutsk emergency center. There were 52 males (40,9 %), 75 females (59,1 %). All patients of this period were divided by age and severity category groups (tab. 1).

Each age group had patients with various physiological condition severity. However old patients were prevailed in III and IV categories. Jaundice duration varied from 2 till 15 days. Patients of I and II categories of severity had obstructive jaundice with the duration till 7 days. III and IV categories - 14 days and more. Long jaundice duration (14 days and more) authentically was more often marked by high indicators of bilirubin - over 200 $\mu\text{mol/l}$, than obstructive jaundice duration till 7 days (tab. 2).

The majority of patients were observed some accompanying diseases during this period. The leading ones were the pathology of cardiovascular and respiratory systems.

According to US examination patients were distributed depending on the ultrasonic image of the gallbladder as follows: 1) catarrhal form; 2) destructive form (phlegmonous-gangrenous). 45 (35,4 %) patients were with catarrhal form, 82 (64,6 %) patients were with the destructive form. Patients were distributed by categories of physiological condition severity due to the card's points and morphological form of gallbladder inflammation (tab. 3).

Endoscopic retrograde cholangiopancreatography (ERC) and endoscopic papillosphincterotomy (EPS) with lithoextraction were done among 73 patients (57,4 %). ERC has allowed revealing concrements in choledochs in all patients. 58 cases (79,4 %) found individual stones, 15 patients (20,6 %) were revealed plural choledocholithiasis. The majority of patients had concrements localised in retrodual part of choledochs and in the ampoule of duodenal papilla.

Improved medical tactics were developed depending on the form of acute cholecystitis and category of patient's physiological condition severity (tab. 4).

Results and discussion. 2-stages treatment method was applied according to tactics in 43 patients with catarrhal cholecystitis and I, II and III categories of severity. At the first stage we carried out EPS in combination with lithoextraction. Technical difficulties during EPS were noted in 2 cases. The causes were: a large single stone (more 15mm) and plural concrements. The decrease of initially raised level of bilirubin was marked on 5-7 days after EPS. This criterion was considered as the indication to the beginning of the second stage - cholecystectomy. LC was performed in 36 patients, CMA - in 7 patients. The conversion on traditional laparotomy was required in 3 patients due to extensive infiltrate in hepoduodenal zone and in 1 case because of the vesical artery bleeding. After 2 stages medical tactics 3 patients of I and II categories of postoperative complications have developed: hematoma of gallbladder bed – 1 patient; drainage disposition of choledochs - 1; acute pancreatitis - 1. 3 patients of III category of severity were observed the suppuration of the postoperative wound in the postoperative period - 1 patient; hypostatic pneumonia - 1 patient; cardiovascular insufficiency - 1. There were no lethal issues in this group of patients.

EPS with lithoextraction were done in two patients with catarrhal form of acute cholecystitis and IV category of severity after intensive therapy in intensive care department within 24 hours. One patient had bleeding from papilla cut. One patient has died of acute cardiovascular insufficiency.

54 patients with the destructive form of gallbladder inflammation and I, II categories of physiological condition severity, the priority was given to urgent one-stage correction of cholecystitis choledocholithiasis from minilaparotomy access. There were 8 cases of traditional laparotomy. The causes were: extensive infiltrate of hepoduodenal cord in 2 patients; vesical artery bleeding - 2; gallbladder bed bleeding - 2; adhesive process in subliver space - in 2 cases. Postoperative complications were observed in 4 patients: suppuration of the postoperative wound - 1; drainage disposition of choledochs - 1; papilla cut bleeding - 1; hypostatic pneumonia - 1. There were no lethal issues in this group of patients.

21 patients with the destructive form of acute cholecystitis and III category of severity 3 stages medical tactics was applied. At the first stage the microcholecystostomy by US control was used after intensive therapy in intensive care department within 24 hours. At the second stage EPS with lithoextraction were made after inflammatory gallbladder cupping. At the last stage we made CMA - 11 patients, LC - 10. Transition to wide laparotomy was carried out in 5 patients. It was connected with high operative manipulations complexity because of the extensive inflammation in hepoduodenal cord. Postoperative complications took place in 6 cases which causes were: papilla cut bleeding - 1; hypostatic pneumonia - 1; sharp cardiovascular

insufficiency - 1; hepatic-renal insufficiency - 2; flaccid peritonitis - 1. Three patients have died in the nearest postoperative period due to hepatic-renal insufficiency (1), sharp cardiovascular insufficiency (1) and flaccid peritonitis (1).

The most successful medical tactics in 7 patients with the destructive form of acute cholecystitis and high operational- anesthesiology risk (IV category) was microcholecystostomy by US control. At the last stage EPS with lithoextraction were done after removal of intoxication symptoms and decrease of the initial score. 3 patients of this group had postoperative complications: sharp cardiovascular insufficiency in 1 patient; two patients have died from hepatic-renal insufficiency (1) and thromboembolism of lung artery (1).

The character and frequency of postoperative complications and lethality by severity categories are presented in tab. 5.

The data in table 5 show that in the second period of supervision, there were postoperative complications in 21 patients (16,5 %), including 6 cases (4,7 %) with lethal issue.

Conclusion. Thus having introduced in clinical practice the point's estimation of physiological condition severity we had been improved tactics of treatment of patients with acute cholecystitis, complicated by mechanical jaundice and choledocholithiasis. The differentiated choice of endoscopic correction of choledocholithiasis and timely operation based on application of minimally invasive technologies in optimum terms and necessary stages treatment, has given the chance to improve considerably the results of treatment. This approach helped us we to avoid postoperative complications in gallbladder and ducts operations. Using objective criteria of endoscopic choledocholithiasis corrections and minimally invasive operations, we have reached considerable decrease in postoperative complications to 16,5 % and lethality to 4,7 %.

Literature

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Table 1

Distribution of patients by age and severity

Age, years	Quantity of patients n(M±m%)	Category of physiological condition severity n(M±m%)			
		I	II	III	IV
20-39	6(4,7±1,8)	5(13,2±3,0)	1(1,8±1,2)*	-	-
40-59	45(35,4±4,2)	20(52,6±4,4)	21(37,5±4,3)*	4(16,7±3,3)	-
60-69	55(43,3±4,3)	12(31,6±4,1)	29(51,8±4,4)*	10(41,6±4,3)	4(44,4±4,4)
70-79	15(11,9±2,8)	-	1(1,8±1,2)	9(37,5±4,2)	5(55,6±4,4)
80 and older	6(4,7±1,8)	1(2,6±1,4)	4(7,1±2,2)	1(4,2±1,7)	-
Total	127(100,0)	38(100,0)	56(100,0)	24(100,0)	9(100,0)

*-Differences are statistically significant in comparison with I category of severity (p <0,05)

Table 2

Duration of obstructive jaundice by severity categories

Duration of obstructive jaundice, days	Total patients n(M±m%)	Category of physiological condition severity n(M±m%)			
		I	II	III	IV
To 7 days	71(55,9±4,4)	19(50±4,4)	43(76,8±3,7)	8(33,3±4,1)	1(11,1±2,7)
from 7 – 14 days	26(20,5±3,5)	11(28,9±4,0)	8(14,3±3,1)	4(16,7±3,3)	3(33,3±4,1)
from 14 and more	30(23,6±3,7)	8(21,1±3,6)	5(8,9±2,5)	12(50±4,4)	5(55,6±4,4)
Total	127(100,0)	38(100,0)	56(100,0)	24(100,0)	9(100,0)

*-Differences are statistically significant in comparison with I category of severity (p < 0,05)

Table 3

Distribution of patients by the morphological form of gallbladder inflammation and severity categories

The form of gallbladder inflammation	Total n (M±m%)	Category of physiological condition severity n (M±m%)			
		I	II	III	IV
Catarrhal	45(35,4±4,2)	19(42,3±)	21(46,7±)*	3(6,6±)*	2(4,4±)*
Phlegmonous-gangrenous	82(64,6±4,2)	19(23,2±)	35(42,7±)*	21(25,6±)*	7(8,5±)*
Total	127(100,0)	38(100,0)	56(100,0)	24(100,0)	9(100,0)

*-Differences are statistically significant in comparison with I category of severity (p < 0,05)

Table 4

Improved medical tactics

The form of acute cholecystitis	Diagnostics	Severity category	Medical tactics
Catarrhal	Physical examination US, EPS	I II	2 stages medical tactics 1. EPS+ LE 2. LC or CMA in the delayed order
		III	Preoperative preparation in intensive care department during 12-24 hours. 1. EPS + LE; 2. LC or CMA severity category decrease in the delayed order
		IV	Preoperative preparation in intensive care department during 24-48hours. EPS+ LE
Phlegmonous-gangrenous	Physical обследование US, EPS	I II	Preoperative preparation during 6-12 hours single-step correction cholecysto choledocholithiasis CMA + CLT + choledochitis drainage
		III	Intensive therapy in intensive care department during 12-24 hours 1. Microcholecystostomy 2. EPS + LE; 3. CMA + CLT + choledochitis drainage in category severity decrease
		IV	Intensive therapy in intensive care department during 24-48 hours 1. Microcholecystostomy 2. EPS + LE

Notes: laparotomy cholecystectomy (LC), cholecystectomy from mini access (CMA), choledocholithotomy (CLT), endoscopic retrograde cholangiopancreatography (ERC), endoscopic papillosphincterotomy (EPS), lithoextraction (LE), ultrasonic examination (US)

Table 5

**Structure of postoperative complications
by categories of physiological condition severity**

Character of complications	Total	Category of physiological condition severity, n			
		I	II	III	IV
Flaccid peritonitis	1(1)	-	-	1(1)	-
Suppuration of the postoperative wound	2	1	-	1	-
Hematoma of gallbladder bed	1	-	1	-	-
Drainage disposition	2	1	1	-	-
Papilla cut bleeding	3	-	1	1	1
Hypostatic pneumonia	3	-	1	2	-
Sharp pancreatitis	1	-	1	-	-
Sharp cardiovascular insufficiency	4(2)	-	-	2(1)	2(1)
Hepatic-renal insufficiency	3(2)	-	-	2(1)	1(1)
Thromboembolism of lung artery	1(1)	-	-	-	1(1)
Total	21(6)	2	5	9(3)	5(3)

(...) - In brackets the quantity of the died patients was specified

Gavriliev S.N., Matveev A.S., Potapov A.F., Ignatiev V.G., Golubev A.M., Moroz V.V.,
Reshetnyak V.I., Shamaeva S.Kh.

**Clinical and bacteriological assessment of antibacterial therapy efficacy in patients with
abdominal nosocomial infection in intensive care unit**

Nosocomial infections are the main reasons of death rate in intensive care units of surgical profile. The growth of pathogen resistance causes treatment complications. Therefore, reconsider of antibiotics formulary should be done taking into an account clinical and bacteriological estimation of effectiveness and creating schemes of antibacterial preparations in Republics Hospital № 2 –Center of Urgent Medical Aid.

Keywords: nosocomial abdominal infection, empirical antibacterial therapy, intensive care unit.

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Authors:

1. Gavriliev Semen Nikolaevich - the post-graduate student of MI NEFU named after M.K.Ammosov
2. Matveev Afanasij Semenovich - PhD., the senior lecturer, doctor anesthesiologist-expert in resuscitation RHN№2 - CEA; alanay-mac71@rambler.ru
3. Potapov Alexander Filippovich - MD., professor; the head of Chair of anesthesiology, resuscitation and intensive therapy with a course of the first help of MI NEFU
4. Ignatyev Victor Georgievich - MD., professor; the head of Chair of MI NEFU
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6. Moroz Victor Vasilevich - MD., professor, the corresponding member of the Russian Academy of Medical Science, director of URAMS of scientific research institute of the general resuscitation named after Negovsky RAMS

7. Reshetnjak Vasily Ivanovich - MD., professor, the scientific secretary of dissertational council URAMS of scientific research institute of the general resuscitation named after Negovsky RAMS
8. Shamaeva Stepanida Haritonovna – PhD (Biology), the head of Clinical bacteriological laboratory RHN^o2 - CEA

Gafarov V. V., Tatarinova V. V., Gorokhova E.V.

Morbidity, mortality and lethality from acute myocardial infarction in Yakutsk in 25-64 age group (the WHO program « Register of acute myocardial infarction»)

Summary

The indices of morbidity, mortality and lethality from acute myocardial infarction in population of Yakutsk in the age group of 25 – 64 years in dependence of gender and national identity in the period 2004-2006 are investigated.

It is revealed that morbidity, mortality and lethality from acute myocardial infarction with ageing become higher, males suffer this disease significantly more often than females ($p < 0,001$). Morbidity and mortality from MI are significantly higher in the non-indigenous males than in the indigenous ones throughout all the period of investigation. In the females of young age group there are no significant distinctions in the MI morbidity, in the senior age groups the tendency to morbidity increasing among non-indigenous women is noted.

Keywords: myocardial infarction, morbidity, mortality, lethality, age.

Preamble

The myocardial infarction is a disease that may result in ultimate recovery without any medical aid, and vice versa, may end with the patient's death in spite of all the medical efforts. However, there is a great amount of sick people between these extremes whose lives depends to a large extent on the well-timed medical intervention and on the physician's knowledge, competence and potential. According the American Association of Heart data approximately 1,5 million people have MI annually. Moreover, the economic consequences connected with MI are quite serious. According the data published in 1996 the damage caused by IHD is more than \$60 billions p.a., and it being known that about the half of this sum is due to AMI. The medical treatment annual cost of the patient who has had MI is \$12 000.[2,12,16,18,20]. In Russia 36% of men and 40,5% of women die from the Cardiovascular Disease at the age of 25-64. The comparison of the mortality rate in this age group in different countries of Europe shows that it is higher in 2,5 for the Russian men and women than that of Europe on the average and almost in 3-4 times higher than that of our neighbour Finland [3,5,6,7,8,9,10,11,12,14,15,17,19]. The clinical and

epidemiological investigations made on the Cardiovascular Diseases in the Republic of Sakha (Yakutia) also indicate the increase of the diseases of the circulatory system in recent years.

Research objective: the investigation of the morbidity, the death and the lethality rates from the acute myocardial infarction among the residents of the town of Yakutsk in the 25 – 64 age cohort with adjustment for age, sex, and national identity on the base of the WHO standard programme “Acute myocardial infarction register”.

Subject and methods of investigation: The investigation according to the WHO programme “Acute myocardial infarction register” in the period from 01.01.2004 till 31.12.2006 among the population of Yakutsk in the 25 – 64 age cohort. All the cases of MI incidence, event rates and sudden cardiac deaths have been included in the investigation. For the reason of the clinical presentations, the series of the electrocardiographic findings, the content of blood serum enzymes, and also the autopsy results, if they were, the choice of the diagnostic category “definite” MI (DMI) or “probable” MI (PMI) was made. On the basis of the criteria aforesaid the following was detected: 799 cases of MI incidence (men 74,7%, women 25,3%), it is 151 (18,9%) for the native population and it is 648 (81,1%) for the nonindigenous people, and 271 case fatality, it is 45 (16,6%) for the native population and it is 226 (83,4%) for the nonindigenous people. The statistical data manipulation is being made with the usage of the criteria in the standard statistical software package «SAS», «SPSS 9». The differences of rates on the significance level were considered to be reliable ($p < 0,05$).

Results and discussion of the investigation:

The MI incidence study (chart 1) all over the years of investigation among the residents of Yakutsk has ascertained that the MI incidence is reliably significant for the indigenous women in the 45 – 54 age cohort in 2006 in comparison of that in 2005 0,9 and 0,1 per 1 000 respectively ($p < 0,05$). In whole the MI incidence in the 25-64 age cohort of both sexes is on one and the same level over a period of investigation irrespective of the national identity in 2004-2006 1,9;2,2;2,1, both for the native population 0,9;0,9;0,9 and for the non-indigenous people 2,7;3,2;3 per 1 000 respectively.

The age-adjusted MI incidence study has brought to light that the case of MI is reliably increasing with age and considerably in the 55 - 64 age cohort irrespective of sex and the ethnical identity ($p < 0,001$). The reliably significant increase of MI incidence for the non-indigenous men was ascertained in the 35 – 44 age cohort ($p < 0,001$), and for the native men in the age of 45 – 54 years old ($p < 0,05$). The MI incidence increase among the women was found

in the 45 – 54 age cohort regardless of the national identity both for the native women ($p<0,05$), and for the non-indigenous women ($p<0,001$).

The MI incidence analyses made among the ethnical group have revealed the reliably significant predominance of the non-indigenous men over the native men during the years of the investigation between 2004 and 2006 4,3;5,0;4,7 and 1,7;1,7;1,4 per 1 000 respectively ($p<0,001$). The reliably significant difference in MI incidence was not found among the women of a younger age cohort. The tendency of predominance of the non-indigenous women over the native women could be seen in the older age cohorts.

The sex-adjusted MI incidence analysis has exposed the men's reliably significant predominance over the women over the time of investigation in 2004-2006 3,2; 3,6; 3,4 and 0,8; 1,1; 1,0 per 1 000 respectively ($p<0,0001$).

The MI case fatality rate study in the 25-64 age cohort of the town of Yakutsk (chart 2) has elicited that the MI case fatality rate of both sexes remains approximately stable over a period of investigation regardless of sex and ethnical identity in 2004-2006 64,6;74,4;72, both for the native population 19,7;31;30,3, and for the non-indigenous residents 99;109;103,4 per 100 000 respectively. Among the men 119;119,4;134, native men 33,2;50,5;61,7 and non-indigenous men 179;170,4;183,6 and among the women 18,6;36,5;20, native women 9,5;16,1;6,3 and non-indigenous women 26,2;53,3;31,1 per 100 000 respectively.

The age-based MI case fatality rate analyses have exposed the reliably significant increase of MI case fatality rate with age in the 55 - 64 age cohort irrespective of sex and ethnical identity both in men ($p<0,001$), and in women ($p<0,05$) in 2005.

The ethnicity-based MI case fatality rate analysis have revealed the reliably significant predominance of the non-indigenous patients over the native patients regardless of sex, both in men during the years of investigation between 2004 and 2006 179;170,4;183,6 and 33,2;50,5;61,7 per 100 000 respectively ($p<0,001$), and in women 53,3 and 16,1 per 100 000 respectively ($p<0,05$) in 2005.

The MI lethality rates of both sexes in the town of Yakutsk (chart 3) were 33,5;33,2;34,7 in 2004-2006, among the native patients 21,2;33,2;35,4 and among the non-indigenous patients 36,7;33,2;34,5% respectively. The MI lethality rates among the men were 37,2;32,8;39,7 in 2004-2006, for the native men 19,5;30;44,1 and 42,2;33,5;38,8 for the non-indigenous men, among the women 21,7;34;20,3, for the native women 27,3;45,5;14,3 and 20,4;33,3;21,8% for the non-indigenous women respectively.

The MI lethality rates analyses per years of investigation among the native men in 45 – 54 age cohort have revealed the reliably significant increase of the MI lethality rates in 2006 in

comparison of that in 2004 55,6 and 13,3% respectively ($p<0,05$). Among the non-indigenous men in the 45 - 54 age cohort the reliably significant decrease of the MI lethality rates has been revealed in 2005 in comparison of that in 2004 16,4 and 40,3% respectively ($p<0,01$) and the reliably significant increase in 2006 in comparison of that in 2005 33,3 and 16,7% respectively ($p<0,05$). The MI lethality rates analyses per age cohorts over a period of investigation have elicited the reliably significant increase of the MI lethality rates with age and it's peak value is in 55 - 64 age cohort irrespective of sex and ethnical identity, both for the nonindigenous population of both sexes in 2005-2006 ($p<0,05$, $p<0,01$), and for the native population of both sexes in 2005 ($p<0,05$).

The ethnicity-adjusted MI lethality rates analyses have brought to light that MI lethality rate is significantly higher among the non-indigenous men than that of among the native men in 2004 42,2 and 19,5% respectively ($p<0,01$). In women the MI lethality rate shows one and the same level both for the native and for the non-indigenous.

In whole the reliably significant decrease of the MI lethality rates of both sexes has been ascertained in the 35 – 44 age cohort among the non-indigenous residents in 2006 in comparison of that in 24,0 и 52,6% ($p<0,05$). The reliably significant increase of MI lethality rate has been ascertained in the 45 – 54 age cohort in 2005 in comparison of that in 2004 among the native residents 43,7 and 11,1% respectively ($p<0,05$) and the reliably significant decrease of the MI lethality rates has been ascertained in 2005 among the non-indigenous residents in comparison of that in 2004 19,8 and 35,4% ($p<0,05$).

Conclusion:

According to the “AMIR” data the MI incidence rates among the inhabitants of the town of Yakutsk for men of 25 – 64 age cohort are 3,2 – 3,6 per 1 000 inhabitants and are characterized as a mean value in comparison with those of in Russia and in Europe. The MI incidence rate in women of Yakutsk is high and is 0,8 – 1,1 per 1 000 inhabitants, it is higher in Moscow only. The MI morbidity has been significantly higher among the non-indigenous population over a period of investigation in 2004-2006 2,7;3,2;3 and 0,9;0,9;0,9 irrespective of sex both in men 4,3;5;4,7 and 1,7;1,7;1,4, and in women 1,3;1,7;1,4 and 0,3;0,35;0,4 per 1 000 respectively ($p<0,001$). According to the MI incidence registers both of other cities of Russia [1,3,19] and of our findings the case of MI morbidity is significantly increasing with age and especially in 55 – 64 age cohort irrespective of national identity ($p<0,001$). The increase of MI incidence rate has been detected in non-indigenous men in 35 – 44 age cohort, and in native men in 45 – 54. The significant increase of MI incidence rate in women has been detected in 45 – 54 age cohort of the non-indigenous women, and in native women of 55 – 64 age cohort, i.e. the native women

were ten years behind. The findings were made that the men had MI incidence significantly more often than women during the years of investigation in 2004-2006 3,2;3,6;3,4 and 0,8;1,1;1 per 1 000 respectively ($p<0,0001$).

1. The MI case fatality rates among the residents of the town of Yakutsk in 25 - 64 age cohort are 119 – 134 in men and 18,6 – 36,5 in women per 100 000 inhabitants and are characterized as high in comparison with the similar investigations made in other cities of Russia and Europe, higher than in the city of Novosibirsk and in women it is higher in Moscow. The age-standardized MI case fatality analysis has revealed the significant increase of MI mortality with age and especially in 55 - 64 age cohort irrespective of sex and ethnical identity both in men ($p<0,001$), and in women ($p<0,05$) in 2005. The ethnicity-standardized MI case fatality analysis has revealed the reliably significant predominance of the non-indigenous population over the native residents irrespective of the sex both in men 179;170,4;183,6 and 33,2;50,5;61,7 per 100 000 respectively ($p<0,001$) in 2004-2006, and in women 53,3 and 16,1 per 100 000, ($p<0,05$) in 2005. The sex-standardized MI case fatality analysis has revealed the fact that the men die significantly more often from the MI than women over a period of investigation irrespective of the national identity both in native patients 33,2;50,5;61,7 and 9,5;16,1;6,3, and in non-indigenous patients 179;170,4;183,6 and 26,2;53,3;31,1 per 100 000 respectively ($p<0,0001$) in 2004-2006.
2. The MI lethality rate in the town of Yakutsk in 25 – 64 age cohort of both sexes remained stable on one and the same level over a period of investigation irrespective of the national identity and was 33,5;33,2;34,7, among the native population it was 21,2;33,3;35,4 and among the non-indigenous population it was 36,7;33,2;34,5% respectively in 2004-2006. The reliably significant decrease of the MI lethality rates have been ascertained in 35 – 44 age cohort in non-indigenous residents of both sexes in 2006 in comparison of that in 2004 24,0 and 52,6% respectively ($p<0,05$). Also in 45 – 54 age cohort in 2005 in comparison of that in 2004 19, 8 and 35, 4% ($p<0,05$). The reliably significant MI lethality rates increase have been revealed for the native inhabitants in 45 – 54 age cohort in 2005 in comparison of that in 2004 43,7 and 11,1% respectively ($p<0,05$).

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P.I. Kudrina, A.L. Ariev

Depressive frustration at cerebrovascular diseases in patients of elderly and senile age

According to inspection of patients elder 60 on the basis of Neurologic branch of the Geriatric Center high prevalence of depression of minor and average degree in the persons of advanced age suffering from cerebrovascular diseases is revealed.

Keywords: depression, elderly and senile age, an ischemic stroke, discircular encephalopathy.

Introduction. Among the general population of the elderly people 4% suffer from depressive frustration, and those or other forms of subdepressive frustration are found out in 15 % of the population of this age group. Along with other mental frustration of depression at persons of elderly and senile age suffer from 10 to 20 % [1]. The depressive frustration arising at senile age represents the big group of heterogeneous on clinic and etiopathogenesis conditions [2]. Depression is the important factor defining quality of life at senile age. Besides, as depression essentially reduces compliancy, it renders a great influence on the clinical forecast of many somatic diseases of late age [3]. An important feature of depression of late age is propensity to a chronic current which makes senile depression especially burdensome. Under the available data the chronic continuous current of depression at senile age is accompanied by progressing neurodegeneration, an important role in which play cerebrovascular disorders [4]. It is obvious that depression can provoke and aggravate available neurometabolic and cerebrovascular alterations. It, in particular, specifies infringement of a blood-groove marked at depression in frontal shares and reduction of their volume, and also the certificate of destruction of neurons of limbic system and hypothalamus at depression [5].

Research objective. Revealing of depressive frustration at the persons of elderly and senile age suffering from cerebrovascular diseases.

Material and research method. 201 patients with cerebrovascular pathology have been surveyed: 69 of them with ischemic strokes in carotid pools (IS), 137- from a chronic ischemia of brain (CIB). All patients have been hospitalized in neurologic branch of Geriatric Center of Republican Center №3. All supervision has been subdivided into 3 groups of supervision. Criterion of division is variant of CVD. The 1st group is 69 patients with ischemic strokes in carotid pools, the 2nd group – 67 patients with discircular encephalopathy- I, the 3rd group - 70 patients with discircular encephalopathy -II. All researches and treatment techniques were spent on the basis of the informed consent of patients and their relatives, in conformity with the international ethical requirements of WHO. Formation of age-sexual groups is made on the basis of classification of age groups, also in conformity with requirements of WHO. Expressiveness of depression estimate on a scale of depressive frustration of Hamilton which includes 11 parameters: women prevail.

In the 1st group persons at the age of 66-70 years (31,8 %), in the 2nd group of 60-65 years (34,3 %), in the 3rd group 71-75 years (45,7 %) prevailed (table).

Results and discussions. For definition of severity level of depression a total mean score of the patients participating in research was defined.

Depressive frustrations were various on expressiveness and "coloring".

It is shown that the highest point is at patients in a sharp stage of a stroke (patients of I group). It means that after ischemic strokes depression often meets at persons of senile and advanced age that basically is widely known fact. At the analysis of a role of cerebral factors from patients with clinically expressed depression it was found out that its level was authentically ($p < 0,05$) above at right hemisphere of a brain localizations of the ischemic center. This data will be coordinated with results of the researches spent by N.I. Lespuh and testifying that elderly and aged patients with right hemisphere of a brain localization of cerebrovascular process are worse restored in the sharp period of ischemic strokes. Apparently, the close connection of the right hemisphere of a brain with emotionally-motivational functions and occurrence of secondary organic depression at right hemisphere brain localizations of pathological process is the major factor defining degree of rehabilitation.

It is shown that depression symptoms often meet at people suffering from chronic ischemia of a brain. Among patients of 3 groups the total point of depression corresponded to criterion of moderate depression. It means that in clinic discircular encephalopathy stage matters irrespective of concrete living conditions.

As it is known, the developed clinical picture of depression is characterized by a combination of variety of symptoms. The cores from them are the lowered mood, apathy with loss of interests, and also decrease in activity and fatigability. These signs are accompanied by the lowered self-appraisal and indecision, sense of guilt, suicidal behavior, attention disorder and delay of thinking, impellent block or disturbing excitation. Besides, at sick depression often finds out infringements of a dream, appetite, digestion and change of weight of a body. Thus any distinctions of a clinical picture and a current of depression at men and women and its dependence on an educational level are not revealed. It should be mentioned that among patients with depressive frustration prevailed lonely, widowed people that at elderly often is one of principal causes of their psychogenic depressions.

Thus, senile depression is extended, but rather seldom diagnosed frustration. Depression at senile age is characterized by a difficult or atypical clinical picture and tends to a chronic current, and it is often combined with somatic diseases [1].

Conclusions:

1. According to the Hamilton's test depression with identical frequency is met as a result of ischemic strokes at patients at any age. Level of depressive frustration as a whole had no distinct age distinctions.
2. Practically identical frequency meets at sick groups with chronic ischemia of a brain
3. The conducted research has revealed high prevalence of depression of easy and average degree at persons of elderly and senile age with cerebrovascular diseases, thus inclusion in algorithm the Hamilton's test of inspection of patients with cerebrovascular diseases would let increase revealing of depressions considerably.

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Table

Distribution of patients on age

Group	60-65 yrs	%	66-70 yrs	%	71-75 yrs	%	76-80 yrs	%	>80 yrs	%
I N = 69	20	28.9	22	31.8	13	18.8	11	15.9	3	4.3
II n = 67	23	34.3	20	29.8	12	17.9	8	11.9	4	5.9
III n = 70	10	14.3	17	24.3	32	45.7	8	11.4	3	4.3

V. M. Maslikov, G.B. Slizovsky, V. E. Gjunter, M. V. Titov, E.B. Kuznetsov, I.I. Kuzhelivskij

Surgical treatment of keeled chest in children using titanium nickeline materials

The article reflects principles of surgical treatment of keeled chest in the Tomsk Region. It describes an operative approach depending on the deformity kind. The work provides analysis of surgical treatment of 26 patients. There were presented main stages of new technique, which supplement the “classical” kind of surgical intervention. It was noted that using titanium nickeline plates with the shape memory to correct keeled chest in children and adolescents is the method of choice and brings good clinical results.

Keywords: thorax surgery, keeled chest, thoracoplastic, titanium nickeline.

Congenital chest distortions are the defects associated with changes in the chest shape. Funnel chest (FC) is the most common. [1, 3]. Besides cosmetic defect this malformation is accompanied by cardiovascular and bronchopulmonary functional disorders. According to

Russian authors 0.06 - 2.3% of children have FC, 0.2 - 1.3% according to foreign authors [6, 10, 11].

Surgical treatment of congenital chest distortions in children is one of the most serious and urgent problems of childhood thoracic surgery. Currently, there are many methods of thoracoplasty in children with congenital deformities [5, 7, 9]. Improvement and widespread implementation of minimally invasive high-tech methods in surgical treatment of congenital chest distortions is a great stride in this direction [4, 8]. However, some vital questions associated with selection of the optimal method for treatment remain unresolved, i.e. methods of thoracoplasty and sternocostal complex fixation.

Work objective. To estimate the titanium nickellide use efficiency in the surgical treatment of funnel chest.

Materials and Methods

Research is based on the analysis of 78 FC thoracoplastic operations performed at orthopedic department of MLPMU Children's City Hospital No. 4.

72 male and 6 female patients aged 4-20 years were operated over the 1977 to 2009 period. Clinical material is divided into 3 study groups according to the method of surgical treatment.

The first group of 16 children aged 6-14 years was operated from 1977 to 1987 by the method of G.A. Bairov or N.I. Kondrashin [2, 7]. Marshev's splint was used for corrected chest fixation.

In the second group 20 patients underwent thoracoplasty (operated from 1986 to 1995). Round or flat wires were used for osteosynthesis, which were hypodermically implanted into the resected sections of ribs and sternum. Additionally we used a modified suspension splint with four movable supports. Traction threads were fixed by paired rings located on separate thread rods with a damper device. This provides even and graduated tension of traction threads throughout the mobilized sternocostal segment. The splint was easy and convenient to use, taking into account the patient's age.

The third group of 42 patients aged 4-20 years has been operated after 1996. Surgical treatment of this group can be divided into a few main stages.

Stage 1 - the deformed part was exposed by midline incision and mobilization of skin and muscle flaps as one unit.

Stage 2 - greater emphasis was made on mobilizing and correction of deformed ribs and sternum by their section or wedge resection.

Stage 3 - retrosternal commissures and ligaments were removed and parietal pleura layers were released after mobilization of the deformed part of the chest that provided visual control at the most difficult stage of the operation.

Stage 4 - transverse triangular wedge is harvested from the presternum (the upper edge of the funnel), which is subsequently used as an autograft, being fixed to the sternal split after its partial longitudinal section at the bottom of the funnel by Mylar thread.

Stage 5 - one, two or three titanium nickellide plates were used for rigid fixation of the eliminated chest distortion, depending on the appearance and depth of the funnel. They were placed on the front surface of the thorax in the transverse direction so that the curved ends leaned against unmodified parts of the ribs beyond the deformed region. Resected parts of ribs and sternum were fixed by interrupted sutures on the plates. Previously chilled titanium nickellide plates become blood-warm after implantation, thus creating additional corrective force due to thermodynamic properties and at the same time providing rigid correction of the deformation during 10-12 months till complete consolidation and alignment of the corrected segment. Retrosternal tube drainage was used for 3-5 days in the early postoperative period in most children, the wound was sutured by cosmetic stitch.

Results and Discussion

Analysis of the immediate results of FC surgical treatment by various methods of thoracoplasty and stabilization in 3 study groups showed different clinical peculiarities, frequency and form of intra- and postoperative complications, immediate and remote results of treatment.

In the first group (20 patients) 12 children had pleura injury with manifestation of unilateral or bilateral pneumothorax, 8 patients had marginal or extensive tissue necrosis of mobilized skin flap in the area of deformation; in 4 cases there was soft tissue necrosis and osteomyelitis of rib in one case. The use of external Marshav's traction splint entailed bed rest for 2-3 months, then traction threads and the splint were removed. Length of hospital stay in the postoperative period ranged from 2 to 4 months. Loss of correction (recurrence of deformity) was observed during 1-2 years in majority of children from the first group - from mild to extremely severe.

In the second group (18 patients), pleural injury, pneumothorax and hemothorax was found in 8 children, soft tissue necrosis was observed in 7 cases, abscess - in 6 cases. Application of round and particularly flat wires reduced the frequency and intensity of the loss of correction. The splint was removed after 2 months, the wires were removed after 4-6 months. Good results

were obtained in 6 patients, in 10 children - satisfactory, long-term follow-up showed recurrent deformation in 4 patients. Postoperative period in hospital is 2-3 months.

In the third study group (30 patients), clinical results were more successful. 6 children developed pneumothorax and hemothorax, abscess and tissue necrosis were not observed. After a 3-5-day stay in the ICU children were allowed to walk, and the sutures were taken out 10-12 days after the operation. The length of hospital stay in the post-operative period was reduced to 12-16 days. All children within a year after the operation every 1-2 months underwent test survey, and further examination was carried out 1-2 times a year. The plates were removed in 6-10-12 months outpatiently or with hospital admission for 1-3 days. In the follow-up period from 1 to 10 years 20 patients showed good cosmetic results after the chest correction, and 9 patients - satisfactory.

Resume

Thus, the thermodynamic force of titanium nickellide plates provided not only postoperative stabilization of the corrected deformity, but an additional correction in the postoperative period. Application of shape memory titanium nickellide plates for FC correction in children and adolescents is the method of choice and gives good clinical results.

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Endoscopic ultrasound in the assessment of colonic graft after esophagoplasty

E.A. Drobyazgin^{1,2}, Y.V. Chikinev^{1,2}, V.G. Kulikov³, A.V. Kutepov^{1,2},

I.E. Sudovyh²

1 - Novosibirsk State Medical University, Department of Hospital Surgery, Faculty of Medicine
(Head - Professor Y.V. Chikinev). 630091 Novosibirsk, Krasny prospect, 52.

2 - Novosibirsk State Regional Clinical Hospital, Department of Thoracic Surgery (Head of
Department - Prof. Y.V. Chikinev). 630087 Novosibirsk, Nemirovich-Danchenko Str., 130.

3 - Institute of Chemical Biology and Fundamental Medicine, SB RAMS, Center of New
Medical Technologies, Novosibirsk (Head - Professor A. Shevela). 630090 Novosibirsk, Pirogov
Str. 25 / 4

Introduction. Endoscopic ultrasonography of the upper digestive tract was a significant spread in the diagnosis of malignant and benign diseases and staging of tumor [1-5]. In Russia, such studies are not available in all hospitals. Most often used in the study of ultrasonic sensors are the radial and less convex scanning [1].

Publications by endoscopic ultrasound in the evaluation performed surgery are scarce [2]. There are no similar studies of patients after esophagoplasty left half of the colon.

Objective: Assessment of colonic and esophageal anastomosis of the graft after esophagoplasty with the use of endoscopic ultrasound.

Materials and methods:

Endoscopic ultrasound artificial esophagus performed in 19 patients after esophagocoloplastic. All patients were operated on for post-burn cicatricial narrowing of the esophagus. The mean age was $48,5 \pm 3,03$ years.

Ultrasound examination of colonic graft anastomosis and esophageal endoscopic ultrasonography performed on the basis of an endoscope PENTAX EG 3870 with convex probe 5 - 15 MHz with a biopsy channel of 3.8 mm beveled and digital optics of 45 ° with an external diameter of 14 mm (Figure 1). Using this device allows the doctor opportunities in surveys by convex scanning. It also enables high-quality images of blood flow in the method of Doppler color mapping.

Figure 1. Type of vehicle PENTAX EG 3870

In the area of anastomosis localized endosonography as a region merging layers, the wall of the

graft as a five-layer structure localized thickness of 0.5 cm This is clearly seen differetial layers: 1) hyperechoic (echo reflected from the mucosa), 2) hypoechoic (muscle plastic mucosa); 3) hyperechoic (submucosal layer), 4) hypoechoic (muscle sheath), 5) hyperechoic (serosa or adventitia)

The study was conducted endosonography zone esophageal anastomosis, the graft and distal anastomosis (after esophagocoloplastic). Assessment was subjected to anastomoses and the graft wall. In assessing the anastomosis, attention was drawn to the wall thickness, elasticity of the anastomosis, the presence of rigidity in the area of anastomosis was evaluated length of rigid zones, the contours of the walls, the length of merging the layers formed in the area of anastomosis, type of blood flow in the area of the anastomosis with the definition of the pulse wave to the maximum value (in mm. water column). In the study evaluated graft wall thickness, the evenness of its contours, visualization of its layers.

Statistical processing of the data was performed using software SPSS 11.5, Statistica 7.0, MS Excel from MS Office applications 2003 and 2007.

Distribution of indicators in the groups tested for normality using the Shapiro-Wilk test. Values are presented as $M \pm \sigma$ (M - mean value of indicators in the study group; σ - standard deviation). For paired comparisons within groups and assess the mutual influence of signs used Mann-Whitney test. The critical level of reliability null statistical hypothesis is taken as 0.05. Characteristics of the samples are presented as median values with interquartil span 25% and 75%.

Results

In assessing esophagocoloanastomosis revealed the following features. In all cases the anastomosis has a skew position (18 patients). The contours of the walls in all cases even and pathological strains have been identified. Folding in the area of the anastomosis in all cases was longitudinal.

In the area formed by the anastomosis revealed fusion of the cervical segment of the wall layers of the esophagus and colonic graft over the range 2.0 to 3.3 cm average length of the plot fusion was 2.7 (2.5, 2.9) cm wall thickness in the area of anastomosis ranged from 0.8 to 1.25 cm, the average value of 1.1 (0.9, 1.2), see Figure 2 shows endosonogramma esophagocoloanastomosis zone.

Figure 2. Endosonogramm esophagocoloanastomosis (I-cervical segment of the esophagus; II-colonic graft; III-esophagocoloanastomosis).

Depending on the characteristics of the graft blood supply in the area esophagocoloanastomosis

divided into 3 types: central (trunk), loose and mixed.

Trunk (central) type is characterised by blood flow in the wall of the anastomosis 1 or 2 of blood vessels, with a maximum diameter greater than 0.34 mm in diameter and pulse wave, which reaches a maximum value of 5.6 to 12 mm of water column. The average value of the pulse wave was $8,96 \pm 2,35$ mm. water column (Fig. 3a, b). This type of blood supply was in 5 patients.

Loose type of circulation is characterized by a wall of the anastomosis, 3 or more vessels of small diameter (up to 0.34 mm) with the development of a set of collaterals between themselves and the pulse wave component in the maximum value of 5 to 35 mm. water column (Figure 4). The average value of the pulse wave was $13,5 \pm 8,14$ mm. water column. This type of circulation was 13 patients.

Figure 3 a, b. Endoscopic ultrasound esophagocoloanastomosis. Trunk type of blood supply (Doppler).

Figure 4. Endoscopic ultrasound esophagocoloanastomosis. Loose type of blood flow in the area of the anastomosis (Doppler).

In the mixed type of blood supply in the area defined esophagocoloanastomosis blood vessels of different diameter with pulse wave component in the maximum value of up to 9.3 mm. water column (Figure 5). This type of flow occurred in 1 patient.

The difference in mean pulse pressure in patients with trunk ($8,96 \pm 2,35$ mm. Water column) and loose ($13,5 \pm 8,14$ mm. water column) types of blood supply to a statistically significant ($p < 0.05$).

Figure 5. Endoscopic ultrasound esophagocoloanastomosis. Mixed type of blood flow in the area of the anastomosis (Doppler).

Data on the incidence of anastomotic stenosis, depending on the type of blood supply are presented in Table 1.

Table 1.

Just as in patients after esophagogastronomic noted that fewer stenoses esophagocoloanastomosis occur in patients with type trunk blood flow, but the $\chi^2 = 1.79$, $P = 0.1808$) due to the difference is not statistically significant (small number of observations. As in the study of patients after esophagogastronomic noted that the wall thickness of the anastomosis is undergoing a decrease, depending on the time elapsed after the operation. This

indicates a flow in the wall in the area of inflammation anastomose (anastomositis), although the standard endoscopic mucosal change research in the area of anastomosis was not revealed.

According to the study endosonographic inflammation subsides in the area of the anastomosis in most patients in terms of more than 6 months after surgery. However, the statistical processing of the data could not be subjected to, due to the small number of patients.

In all cases graft clearly visualized in all over with a clear differentiation of its layers. The wall is uniform throughout, with a thickness of 0.3 to 0.4 cm pathological entity is not defined (Figure 6).

Figure 6. Endoscopic ultrasound colonic wall of the graft. Can be traced all five layers of wall colonic graft.

Distal anastomosis was visualized as part of the merging of all 5 layers of esophageal wall with the wall of the stomach (duodenum, jejunum), depending on the anastomosis. The contours of the walls in the area of the anastomosis even. In the area formed by the anastomosis revealed fusion of the cervical segment of the wall layers of the esophagus and colonic graft over the 1.8 to 2.9 cm average length of the plot fusion was 2.3 (2.1, 2.6) cm wall thickness in the area of anastomosis was from 0.9 to 1.6 cm, an average of 1.3 (1.0, 1.55) (see Figure 7).

Figure 7. Endoscopic ultrasonography of the distal colonic anastomosis (I - colonic transplant; II - the line of anastomosis; III - the stomach wall).

With the passage of time from the operation panel of the graft undergoes a series of changes: marked thinning of its walls, a more pronounced closer to the distal anastomosis, with a tendency to increase the thickness of the mucosa. In addition, the scar revealed changes in the anterior mediastinum (Figure 8 a, b).

Figure 8. Endosonography colonic transplant at various times after esophagoplasty (a - 12 months, b - after 3 years). Decrease in wall thickness of the graft with a thickening of the mucosa.

The data obtained are comparable with the results of endoscopic and pathologic studies.

Conclusions. The use of endoscopic ultrasound in the assessment of an artificial esophagus reveals three types of blood supply to the graft and anastomosis in the neck, respectively, after esophagoplasty clearly differentiate between proximal and distal anastomoses, the graft wall. In assessing the type of blood supply in the area esophagogastric anastomosis and the subsequent analysis of the data revealed that fewer patients with stenosis of the anastomosis is observed at the loose type of blood supply in the area of $\chi^2 = 1.79$, $P = 0.1808$) the anastomosis (Thus, the

main type of blood supply in the area of the anastomosis is a significant predictor for the occurrence of its stenosis in the postoperative period.

Over time, the transplant operation, changes in the structure of its walls. There is thinning of the wall of the graft is more pronounced closer to the distal anastomosis, with a tendency to increase the thickness of the mucosa. In addition, the scar revealed changes in the anterior mediastinum.

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E.D. Savilov^{1,3}, G.I. Alexeeva², M.V. Mal'tseva³, V.A. Astaf'ev³,
A.F. Kravchenko², E.I. Burtseva⁴

Estimation of the epidemiologic situation by the generalized criterion

¹ Irkutsk State Medical Academy of Postgraduate Education, Ministry of Health and Social Development of Russian Federation

² State Institution "Research-Practice Center 'Phthisiatry' ", Ministry of Health, Sakha Republic (Yakutia), Yakutsk

³ Institute of epidemiology and microbiology, Research Center for problems of family health and human reproduction of Siberian Branch RAMS (RC PFHHR SB RAMS), Irkutsk

⁴ Institute of Applied Ecology of the North (Federal State Research Institution), Yakutsk

A rationale for the use of an aggregate generalized index in conducting an integral estimation of epidemiologic situation and/or population health status is presented. The approach was demonstrated on the case of tuberculosis infection in the Sakha Republic (Yakutia) over a 19 year period (1990–2008), using 4 statistical measures: incidence, morbidity, bacterial load and mortality.

Keywords: methodological approach, generalized measurements, epidemiologic situation, health status.

Brief introduction. Complex estimation of an epidemiologic well-being or ill-being of a defined area and/or health level in some population group is based mainly on comparison between separate statistical measures (such as incidence, morbidity, mortality, disability etc.). The necessity and importance of such approaches is undeniable, but this sort of analysis is sometimes insufficient to make an objective and comprehensive conclusions about the changes in epidemiological situation over several years or over different areas. In these cases, additional use of a generalized index to support the analysis makes sense, as the correct estimation of similar objects in time and space becomes sometimes extremely difficult without such an index. It is, of course, easier to come to final conclusions, when all the observed health measures change in uniform direction (either increase, or decrease). Then it is possible to make a reliable conclusion about differences in epidemiologic situation between different areas or on the same area over time, without generalized quantitative estimation. And even in such cases, a

generalized estimation would be still useful, as it allows to establish a generalized quantitative measure of difference. When the changes observed in health measures are non-uniform and a reliable conclusion is needed, the logical analysis needs to be supported by an integral generalized index.

Hence, the aim of this report is to give rationale for the use of an aggregate generalized index as an additional quantitative tool for estimating the epidemiological situation and/or population health status.

Analysis of the data presented was done using statistical data for tuberculosis infection in the Sakha Republic (Yakutia), an area of high tuberculosis transmission risk, judging by seasonal, socioeconomic and living conditions of the majority of population, and this was witnessed during the years of socioeconomic crisis [1;4]

Materials and methods.

4 measures have been employed to analyze the epidemiologic situation: incidence, morbidity, bacterial load and mortality. The incidence dynamics was assessed for 39 years (from 1970 to 2008), while for the rest of measures (including incidence), the dynamics was assessed for 19 years (from 1990 to 2008). Data were subjected to conventional methods of epidemiologic analysis: comparison of mean levels and increase rates, the dynamics of which were calculated using the data smoothed by least squares method. Besides these, time series trends reliability test technique and correlation analysis for paired and multiple correlations were used [3].

To perform the generalized description of epidemiologic situation, we used a method, earlier proposed for a generalized estimation of environment [2]. The method consists essentially in aligning divergent health measures into a unified system, by applying a universal statistical test, defined as the amount (percentage) of a defined characteristic within the analyzed set of parameters, and is expressed as a relative deviation from the average status.

First, we analyzed each of the individual statistical measures, by calculating an individual index (II) of epidemiologic situation, using the formula:

$$II = \frac{a_i}{M},$$

where:

a_i – is the value of a defined i th annual (monthly, etc.) measure;

M – is the mean value of all measures over a respective observation period.

Next, we obtain the cumulative epidemiologic situation index (ESI) – this is the basic index, and is calculated as the mean value of all the individual indexes (II) included to the analysis:

$$ESI = (II_1 + II_2 + \dots + II_n) / n$$

This approach has found quite a wide application in epidemiologic studies for description of intra-annual dynamics of statistical measures (the so called “seasonality index”). But all such applications of seasonality index imply that estimation is made based on only one data set (e.g., incidence). We propose an approach, which permits to aggregate all the individual indexes of epidemiologic situation into one generalized index.

Next phase of the analysis is the ranking of ESIs, followed by construction of a rating scale. Ranking is done by arranging the indexes in ascending order. The resulting continuous series is then distributed to discrete classes (groups), and value ranges are calculated for each class, which can be ranging within the CI limit, below, or above the confidence limits.

Results. Long-term analysis of tuberculosis incidence in the Sakha Republic (Yakutia) showed that a remarkable and statistically significant decrease (from 138.1 to 69.1 $^{0}/_{0000}$) was observed during the study period (1970–2008), with 1.4 % annual negative increase rates. At the same time, it was found, that the first 20 years (1970–1990) in the study period largely accounted for the generally favorable trend in incidence dynamics, with –4.2 % negative increase rates and with the incidence rate in 1990 dropping to a minimum (45.4 $^{0}/_{0000}$). Over the following period (1990–2008), we observed a stable and statistically significant increase of tuberculosis incidence ($p < 0.0001$) with a 2.8 % positive average annual increase rate. The detection of this unfavorable incidence trend from 1990 to 2008 compelled us to take a closer look at the epidemiologic situation at this period. The main statistical values for epidemiologic situation are shown in Table 1.

As a result of the analysis, the presence of unfavorable trend was shown for incidence, mortality and bacterial load rates (increased by factors of 1.5, 1.3 and 1.1, respectively), while mortality rate had a negative increase rate (Table 1). ESI with a 1.2 increase rate is the aggregate epidemiologic situation index.

Correlation analysis (Table 2) showed a statistically significant association between the ‘incidence–sputum positivity’ pairs. The presence of a pronounced trend ($p < 0.1$) was shown also for ‘incidence–mortality’ pairs. The fact that there is a correlation between ESI and each of the epidemiologic measures (except morbidity) speaks in favor of the use of generalized index in integral estimation of epidemiologic situation. Moreover, there are multiple correlations between

ESI and various pairs of standard epidemiologic measures. All these correlations are of the strong type with a high statistical significance (Table 3).

As a next phase of the study, we ranked the long-term ESIs and derived confidence intervals for the period analyzed. Aggregate epidemiologic situation indexes (ESI) corresponded to a 'normal' epidemiologic situation in a given area for a given period of time, if they were within the confidence limits. All values of aggregate indexes that were below or above the CI limits indicated that epidemiologic situation was either favorable (low level), or unfavorable (high level), respectfully.

An example of estimated epidemiologic situation using the proposed generalized index is shown in Table 4. Besides ranking of ESIs described here, a time series-based approach may be used to analyze the epidemiologic situation (Fig. 1).

Results and discussion. Application of the epidemiologic situation index permits to form an integral quantitative estimation of infectious disease incidence trends, using defined epidemiologic measures, no matter how much of them are included to analysis. This approach can be applied to any infectious disease surveillance and the final estimation of the data can be easily adjusted to various temporal clusters (months, years, etc.), as required. All this could serve as a methodological base to conduct complex estimation of population health, suitable for any given area for a defined period of time.

In this paper, we presented an example of estimated epidemiologic situation for tuberculosis in the Sakha Republic (Yakutia). It was shown, that although the trends for individual statistical health measures were divergent and non-uniform, a generalized quantitative measure of epidemiologic situation has been achieved, revealing an unfavorable dynamics of tuberculosis infection in this largest region of Russia over the last decade. The proposed approach let us identify several years within study period with relatively low and high estimated levels of epidemiologic situation. Also, use of this methodology let us conclude that in Yakutia from 1990 to 2000 there was a continuous aggravation of the epidemiologic situation for tuberculosis, while the period from 2000 to 2008 was characterized by improvement. The dynamics of ESIs during both of these periods was shown to be highly statistically reliable.

Conclusion. Epidemiologic situation index is proposed for use as an additional integral estimation of epidemiological situation.

Table 1

Epidemiologic statistics for tuberculosis in the Sakha Republic (Yakutia), 1990–2008.

Measure	Incidence	Morbidity	Bacterial load	Mortality
Intensive parameter, 0/0000	64.5±1.5	242.9±5.4	86.9±1.3	8.7±0.2
Increase rate, %	2.8	- 1.3	1.0	1.1

Table 2

Correlation coefficients (CC) between individual epidemiologic statistical measures

Note. Here and elsewhere: Statistically significant CCs are given in boldtype

Table 3

Multiple correlations between ESIs and various pairs of standard epidemiologic statistical measures

Measure	Incidence		Morbidity		Bacterial load		Mortality	
	R	p						
Morbidity	-0.24	0.3316	r	P				
Bacterial load	0.66	0.0023	-0.21	0.3976	r	p		
Mortality	0.41	0.0789	-0.02	0.9308	0.19	0.4346	r	p
ESI _c	0.81	<0.0001	0.17	0.4621	0.62	0.0044	0.73	<0.0001

Measures	Correlation coefficient (CC)	p
incidence – morbidity	0.90	< 0.0001
incidence – bacterial load	0.82	0.0001
incidence – mortality	0.92	< 0.0001
morbidity – bacterial load	0.69	0.0050
morbidity – mortality	0.75	0.0012
bacterial load – mortality	0.88	< 0.0001

Table 4

Estimated tuberculosis epidemiologic situation in the Sakha Republic (Yakutia) based on ESI, using confidence interval (CI)

Ranked ESI	Year	Rank scale	ESI level
0.87	1990	< 0.97	Low

0.89	1994	(ESIs below CI limit)	
0.91	1992		
0.92	1991		
0.94	2007		
0.96	1995		
0.96	1993		
0.97	1998	0.97 – 1.03 (ESIs within CI limit)	Norm
0.98	2006		
0.98	1997		
1.00	1996		
1.03	2004		
1.04	2008	> 1.03 (ESIs above CI limit)	High
1.04	2005		
1.06	2002		
1.06	2003		
1.09	2001		
1.11	1999		
1.12	2000		

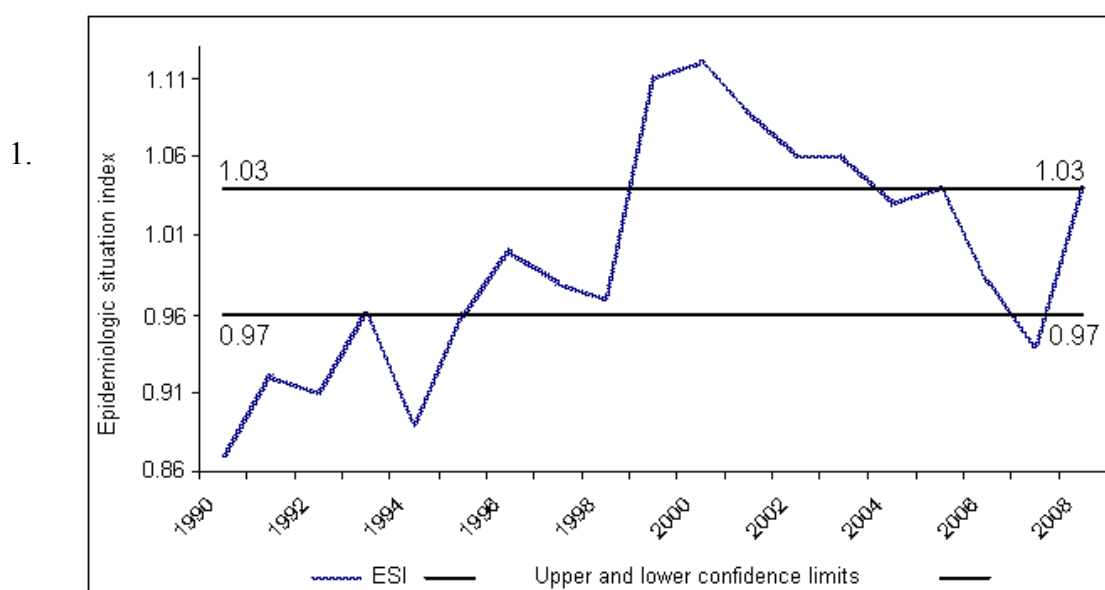


Figure
Long-term

dynamics of epidemiological situation index for tuberculosis in Sakha Republic (Yakutia)

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N.V. Savvina, V. K. Grigorieva

Assessment of patients' satisfaction with quality and availability of the specialized rheumatologic medical care in Republic Sakha (Yakutia)

Medico-sociological research of the population, received specialized rheumatologic medical care in hospitals of Yakutsk is conducted. Distinctions in respondents' answers about conditions of rheumatologic care by rendering type (out-patient and in-patient care) are revealed. Results of sociological study testify to incomplete satisfaction of the population with quality and availability of the specialized rheumatologic care because of organizational aspects in its rendering.

Keywords: care quality, satisfaction, availability.

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Authors: Savvina Nadezhda Valerevna, MD., professor, head of chair of children's illnesses with a course of the organization of public health services and public health, MI NEFU after M.K.Ammosov, Grigorieva Valentina Kimovna, deputy director of OAO "GSMK" Sakhamedstrakh".

N.V. Savvina, V.B. Egorova, U.E. Petyurkanova.

**HEALTH STATE AND REHABILITATION OF CHILDREN IN THE PRESCHOOL
INSTITUTION "NURGUHUN" HATYLY CURAPCINSKIY ULUS**

Medical Institute of Far Eastern State University, Yakutsk.

Summary

Currently the tendency of growth of number of chronic diseases in children by the time they start school, despite the fact that improving the health of children is a leading task of modern medicine, is marked.

We assess the health state and health improvement among pre-school children in preschool institutions. Recommendations for the implementation of the main forms of rehabilitation of children are developed. As a result of their introduction in 2009-2011 improvement of physical development indicators of children is noted.

Keywords: pre-school children, health groups, physical development, diseases.

Studies have shown recently the health of preschool children that are already on admission in pre-school educational institution up to 20% of children have chronic illnesses, a significant number of functional disorders, and high rates of acute illness. Currently, the high incidence of pre-school children do not have pronounced tendency to decrease [1, 2].

According to the Institute of Hygiene and prevention of diseases of children over the past decade, children's health has worsened: decreased number of children's health group I from 23.2 to 15.1%, increase in the number of children of group II (with different deviations) from 60.9 to 67.6% of children and group III (chronic diseases) - from 15.9 to 17.3%. The entire adult population of society is under threat, as the weakening health of the younger generation in a geometric progression threatens the health of future generations [3].

Analysis of morbidity in children of preschool institutions in the Republic of Sakha (Yakutia) (PG YARMIATS, MH (Yakutia), 2009) amounted to 2071.5 on 1000 children aged 0 - 7 years [4]. Specialized outpatient services are available for children's population of Yakutsk and its suburbs, while the regions of the republic under-staffed paediatricians and specialists. This

naturally reduces the work on the preventive, diagnostic and therapeutic measures aimed at protecting health and reducing morbidity.

Provision requiring the use of complex health improvement and preventive measures known. Due to the fact that organized most of the time a child spends in kindergarten are required to conduct health programs in preschools [5,6]. However, the solution of this problem is complicated by the fact that the present methods of improving and preventive work in child care centers are not fully developed. It is also one of the reasons for the low effectiveness of health promotion is its focus on the average child. Personal wellness and preventive work is carried out practically, because there is no experience in the design and implementation of individual directions of development of the child [7,8].

There are some publications on the health of schoolchildren. But there are few on the health status and methods of treatment of children in preschool. We haven't found any studies on the status of rural preschool children in the republic.

Objective: to study the health status of preschool and evaluate the results of sanitary measures.

Materials and Methods:

This work was carried out on the basis of pre-school educational institution called "Nurguhun" at Hatyly Churapchinskiy district from 2009 to 2011 years. Comprehensive medical examinations were carried out by pediatricians, otolaryngologists, neurologists, dentists. According to testimony, preschool children were viewing an ophthalmologist, surgeon, and podiatrist, ultrasonography of the abdomen, kidneys, electrocardiogram, complete blood count, and urinalysis. The results were filled in into the individual child's health cards.

The visiting committee had examined 51 children in 2009, 46 children in 2010 and 49 preschoolers in 2011. According to the survey for 2009: boys - 23 (45.1%) girls - 28 (54.9%).

Age Group: children aged from 1 to 2 years - 14 (27.5%); children aged from 3 to 4 years - 15 (29.4%); children from 5 to 6 years - 19 (37.2%); children aged from 7 - 3 (5.8%). The median age was: for girls 3.6 ± 1.5 and for boys 3.9 ± 1.5 .

According to the inspection held in 2010: 22 (47.8%) of boys and 24 (52.2%) of girls.

Age Group: children aged from 1 to 2 years 22 11 (23.9%); children aged from 3 to 4 years - 15 (32.6%); children aged from 5 to 6 years - 18 (39.1%); children of 7 years old - 2 (4.3%). The median age was: for girls 4 ± 1.6 and for boys 4 ± 1.9 .

According to the inspection in 2011 for boys - 27 (55.1%); for girls - 22 (44.9%):

Age Group: 17 children aged from 1 to 2 years (34.7%); 13 children aged from 3 to 4 years (26.5%); 11 children aged from 5 to 6 (22.4%) and children aged from 7 to 8 years (16.4%).

Children were divided into the following groups of health depending on the health state:

The first group (I). Healthy children who do not have abnormalities in all parameters of health, including children who have slight morphological abnormalities do not affect on the overall health and do not require correction.

The second group (II). Healthy, but with the functionality and some morphological abnormalities, as well as with decreased resistance of the organism, with minor and moderate disabilities and behavioral disorders. This group of children with a risk of chronic disease.

The third group (III). Children with chronic illness or congenital defect, in a state of compensation, with retained functionality organisms.

The fourth group (IV). Children with chronic illnesses or with congenital malformations, in a state subcompensation, with reduced functionality, but with no significant violations of well-being

The fifth group (V). Children suffering from severe chronic diseases or with severe developmental disabilities in a state of decompensation, with a significantly reduced functional capabilities of the body and children with disabilities since childhood.

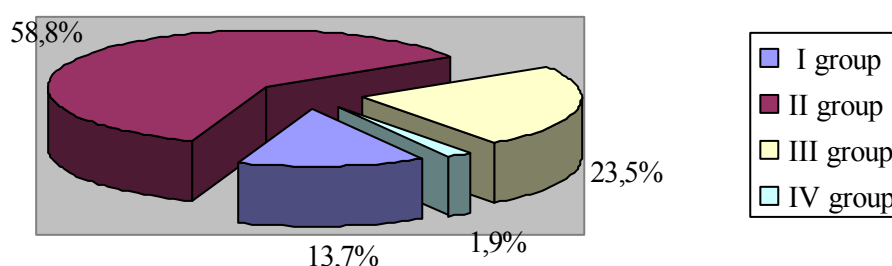


Fig.1. The distribution of health groups in 2009.

By groups of health in 2009. Before recovery: I group - 7 (13,7%), II group - 30 (58,8%), III group - 12 (23,5%), IV group - 1 (1, 9%), V band - 0. (Fig. 1)

Results and discussion:

Analysis of the data showed that the majority of children has dominant mezosomy somatype in all age groups. Physical development of preschool children in 2009 showed: predominance of mezosomatotype type of children - 41 (80.4%), makrosomatotype type - 2 (3.9%) and preschool children - mikrosomatotype type 8 (15.7%). Three parameters of physical development were taken into account in determining the somatype: body length, body weight and chest circumference. (Table 1).

Table 1.

Physical development (PD) of preschool children in 2009

PD is below average		PD is average		PD is above average	
abs	%	abs	%	abs	%
8	15,7	41	80,4	2	3,9

The results of health assessments of children in 2009 showed a high percentage of morbidity Respiratory - 12 (23.5%) within children. This group has identified diseases such as hypertrophy of the tonsils of the 1st and the 2nd degree (8 children =15.6%), recurrent bronchitis (2 children =3.9%), the adenoids (2 children =3.9%).

Among the diseases of the digestive system were diagnosed: dysbiosis - 4 (7.8%), biliary dyskinesia - 2 (3.9%), Mts. gastro - 1 (1.9%).

Diseases of the nervous system manifested syndrome of increased neuro-reflex excitability and hypertensive. In addition, the identified logoneurosis, residual encephalopathy and delayed speech development in 6 (11.7%).

Diseases of the circulatory system - 2 (3.9%), CHD (VSD), operas and CHD (tetralogy of Fallot), operated on the girl in March 2008.

Diseases of the blood . Anemia - 3 (5.8%).

Caries of the ICD-X assigned to the class of diseases of the musculoskeletal system, but we viewed it as a separate dental pathology - 14 (27.4%). For diseases of the musculoskeletal system carried residual rickets - 3 (5.8%), impaired posture - 10 (19.6%), flat - 1 (1.9%). Endocrine: Stunting - 1 (1.9%), low weight - 4 (7.8%). Children with symptoms of atopic dermatitis attributed to a group of skin diseases 6 (11.7%). Diseases of the genitourinary system: kidney pyeloectasia - 2 (3.9%), chronic pyelonephritis, 1 (1.9%). Diseases of the eye: myopia - 1 (1.9%) with a high degree of ambliopatiey.

Improvement of pre-school included the following:

1) The rational mode of the day: the exclusion of overwork and overstimulation, increased sleep at 1:00. It is obligatory to have naps. In the presence of astheno-neurotic disorders were shown walking in the fresh air before going to bed.

2) Hardening and physical education. Tempering procedures (air baths, water treatment, stopoterapiya stones, pine cones) are combined with holding the massage of the chest and gymnastics. The massage is conducted 2-4 times per year, the course was 14 days.

3) Therapeutic exercises aimed at ensuring good drainage bronchus, increased tone of respiratory muscles.

4) Physical therapy techniques. During the winter months there was a general UV irradiation at the rate of 20 procedures. For children under 3 years the UV irradiation was carried out on an individual procedure.

5) Rinse the mouth and throat, using extracts of herbs that have antibacterial activity (St. John's wort, calendula, chamomile, celandine, eucalyptus, plantain, sage).

6) Oxygen cocktails with infusions of herbs (plantain, St. John's wort, chamomile). Applied on an empty stomach 30 minutes before meals, course duration up to 3 weeks, conducted two courses per year.

7) Vitamin therapy. Concentrates are used vitamin drinks of various companies, such as: Kaltsinova and Wibowit (KRKA, Slovenia), Tsevitana (Yugoslavia), Vitanova (Poland). One glass of drink provides 100% of the daily requirement of these vitamins for children at the age from 1 to 6 years.

8) The use of adaptogens and biogenic stimulators. This group includes substances that increase the overall resistance of the organism, they are: a) herbal products apilaktoza, apilikvirit, ginseng honey, politabs, tsernilton, propolis, extracts of Rhodiola rosea, Rhaponticum, eleuterakok b) products of animal origin: Pantocrinum c) anabolic agents: potassium orotate, nerabol, retabolil, safinor.

The performance by groups of health improved after implementing the program "Health activities in preschool".

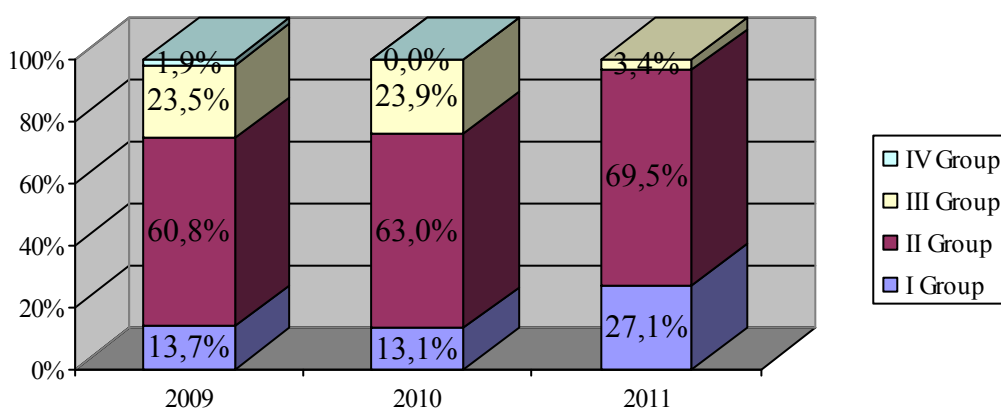


Fig. 2. Distribution by groups of health 2009 - 2011

During the period of recovery, the number of children in the 1st group of health (I) improved up to 13.4%; in the health group (II) by 8.7%. The number of children in the health group (III) decreased at 20.1% and in the health group (IV) decreased at 1.9% (Fig. 2).

In physical development, health improvement after the introduction of corrective gymnastics for toddlers, noted an increase in the number of children with an average physical development and also reduction of children with reduced physical development.

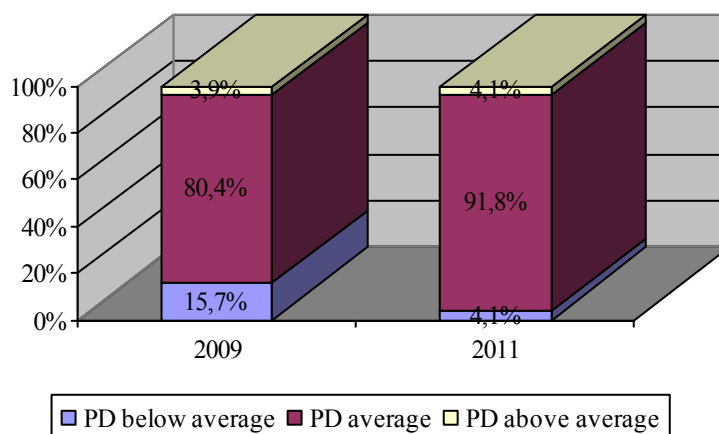


Fig. 3. Assessment of the physical development of preschool children for 2009-2011

Indices of physical development had improved during the period from 2009 to 2011: PD below average decreased by 3.8 times, respectively, the mean PD increased by 11.4% (Fig. 3). Out of the total incidence revealed a positive trend after the recovery program.

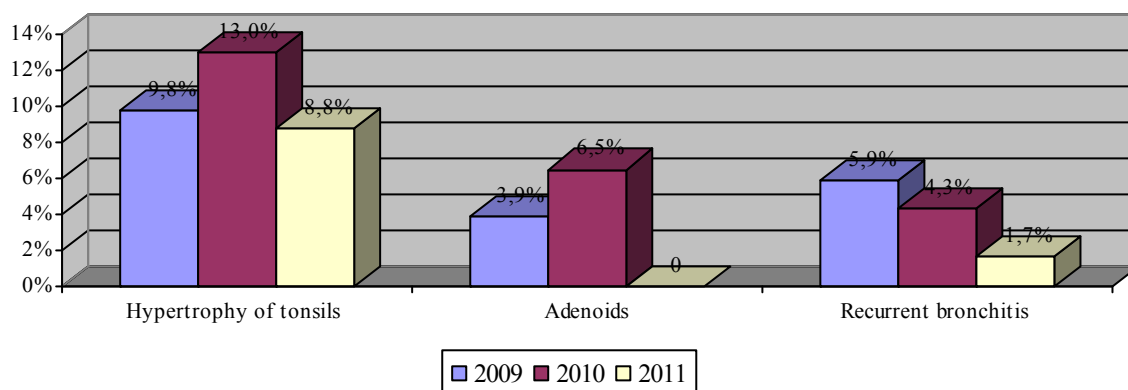


Fig. 4. Indicators of respiratory diseases in 2009 - 2011

These examinations for physicians in 2011 showed a significant reduction in respiratory diseases. Hypertrophy of the tonsils in 2011 compared to 2010 decreased by 4.2% and 6.5% for adenoids. Recurrent bronchitis in 2009 decreased by 4.2% (Fig. 4).

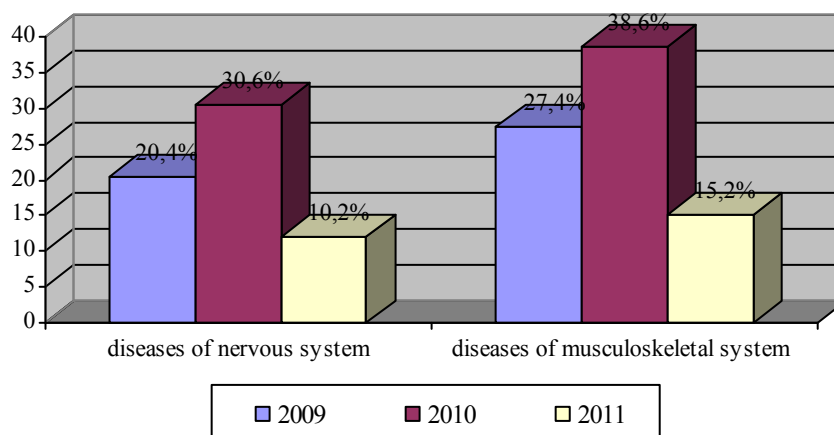


Fig. 5. Comparative analysis of diseases of the nervous system and musculoskeletal system during the period from 2009 to 2011.

In 2010, there was an increase in the number of children with disorders of the nervous system by 7.9%, delayed speech development - 13.0% compared with year 2009. Causative factors of child neurology may be called perinatal history laden, social conditions and other factors. The number of these diseases is reducing at 20.4% in the year 2011.

According to the results of medical examinations for 2009 - 2010 years there was a trend to an increase in the number of children with impaired posture and flat feet. In the preschool years, these manifestations are generally functional in nature and are determined mainly by the weakness of muscle tone and ligament. Special physical exercises are the main remedy for violations of the musculoskeletal system, as well as prevention of their violation.

In 2009, a cooperation agreement has been concluded between the kindergarten "Nurguhun" in Churapchinskiy ulus and the Federal State Higher Professional Education "Churapchinsky State Institute of Physical Culture and Sports." Remedial work to prevent incorrect posture and flat has been carried out in 2010. Corrective wellness gymnastics for toddlers has been performed on daily basis. According to data of 2011, the indicators of disease of the musculoskeletal system fell down by 23.4% (Fig. 5)

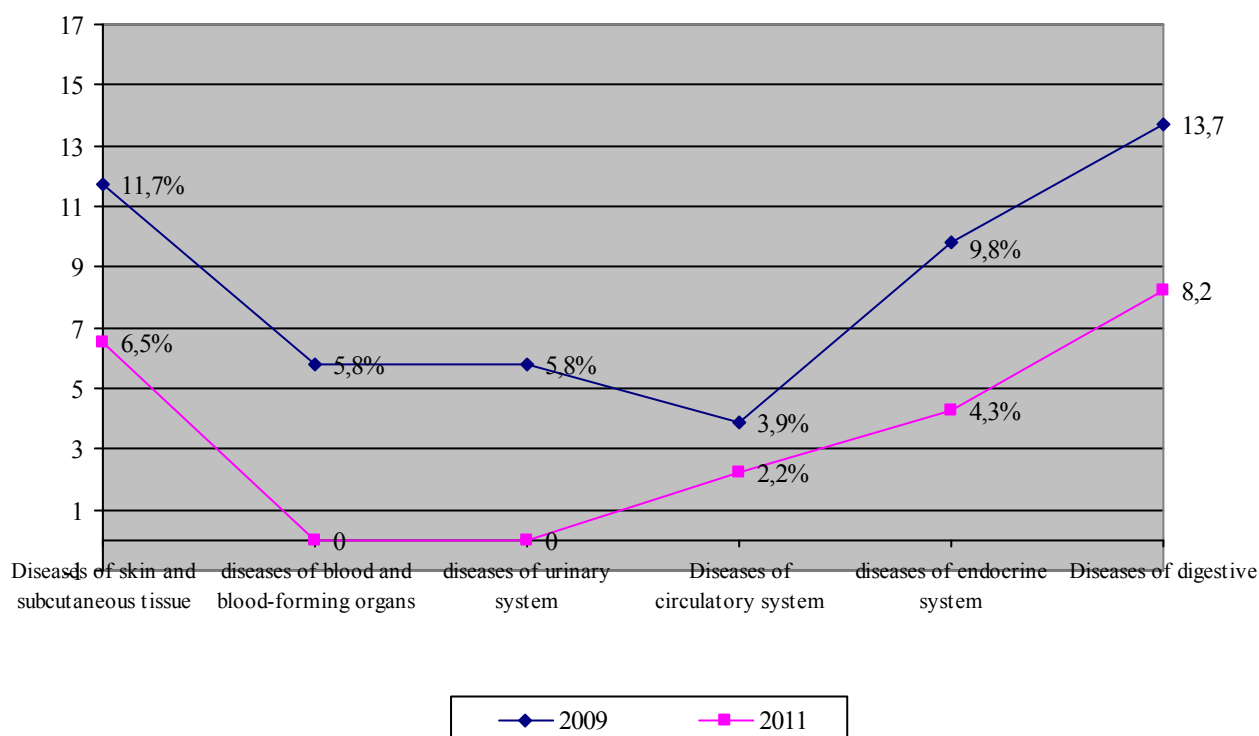


Fig. 6. The dynamics of the total incidence preschoolers for the period from 2009 to 2011
The rates of urinary system diseases and diseases of the blood and blood-forming organs decreased by 5.8%, compared with 2009. Prevalence of atopic dermatitis decreased by 5.2%.

Diseases of the circulatory system decreased by 1.7%, and endocrine, nutritional and metabolic diseases by 2.3 times. Digestive diseases decreased by 5.5% (Fig. 6).

Dental pathology (caries) increased by 5.2% in 2011, compared with 2009. It is due to the lack of a dentist. Children are not prevented and eliminated the formation of cariogenic situation in the oral cavity.

Conclusion.

Thus, the introduction of the program "Health activities in preschool," improved health indicators, and physical development of preschool children at preschool institution "Nurguhun" in the settlement of Hatyly at Churapchinskiy area. During the period of recovery, the number of children in the health group (I) improved to 13.4%, in the health group (II) by 8.7%. The number of children in the health group (III) decreased by 20.1% and in the health group (IV) by 1.9%. Physical development below the average decreased by 3.8 times. The average physical development increased by 11.4%, respectively.

Out of the total incidence decreased in all groups of diseases. Diseases of the respiratory system decreased by 9.1% on the digestive system and endocrine system by 5.5%, diseases of the nervous system by 20.4%, disease of the musculoskeletal system by 23.4%, diseases of the skin and subcutaneous tissue at 5, 2%, diseases of the blood-forming organs and diseases of the genitourinary system by 5.8%. Diseases of the circulatory system decreased by 1.7%.

Improvement of children requires a long, orderly and systematic implementation of complex medical and social measures.

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L.S. Zakharova, S.I. Semenov, F.A. Platonov, U.M. Lebedeva, V.G. Krivoschapkin, M.A. Fedorova

Type 2 diabetes mellitus in Yakutia: prevention measures

This paper presents review of traditional feeding disorder in the North. The efficiency of the work of schools on prevention of type 2 diabetes mellitus (MD 2) in Yakutia is shown. Recommendations on nutrition of MD 2 patients and list of recommended and excepted foods of therapeutic diet #9 are given. The authors present model menu and the multiplicity of meals for MD patients. The role of physical activity and refusal from harmful habits in treatment and prevention of MD type 2 are shown.

Keywords: diabetes mellitus type 2 (MD 2), metabolic syndrome, carbohydrate metabolism, glucose, hypoglycemia, hyperglycemia, diet.

Authors:

1. Zaharova Larisa Semenovna –junior scientist, the doctor-endocrinologist of the Center of medical and preventive nutrition «Health Institute»
2. Semenov Sergey Innokent'evich - MD., leading scientist of «Health Institute»
3. Platonov Fedor Alekseevich – MD., head of department of «Health Institute»
4. Lebedeva Uljana Mihajlovna - PhD., senior scientist, the head of the Center of medical and preventive nutrition of «Health Institute»
5. Krivoschapkin Vadim Grigor'evich - MD., professor, the academician of AS RS (Y), director of «Health Institute»
6. Fedorova Margarita Afanasevna - head doctor of Yakut republican endocrinological dispensary

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Peterson A.M., Glinskaya E.V., Griva G.I., Brouchkov A.V., Repin V.E., Chernyavskiy V.F., Sofronova O.N.

BACTERIA ISOLATED FROM RELICT FROZEN TERRAINS OF THE CENTRAL YAKUTIA

The results of the first stage of comprehensive studies of culturable microorganisms isolated from the oldest permafrost exposed rocks of Mammoth Mountain in Yakutia are presented, and their potential scientific and applied significance is shown.

Key words: permafrost, biochemical reactions, relict microorganisms, taxonomic diversity, phenotypic properties.

Introduction

Permafrost rocks are widespread on the Earth, and in some regions their age reaches hundreds of thousands or millions of years. They present a natural store of the Earth's oldest

“preserved” natural communities of microorganisms, a bank of ancient genes and biomolecules [22, 12].

The study of viable bacteria in the Earth’s cryosphere is interesting in connection with some aspects of microorganism evolution [6, 9, 18], the evaluation of microbiological diversity on the Earth [20, 26], the possibility of life on other planets [29], the potential for biochemical activity of microbial biomass of permafrost rocks [21, 17] and their potential for possible interrelations with contemporary biocenoses [19, 26]. The importance of the study of microbiote in cryosphere is also connected with the probability of the presence and preservation in them of viable pathogenic microorganisms and the need for the development of preventive measures in the case of their release as a consequence of anthropogenic activity or natural melting of permafrost rocks [28, 27]. In addition, the study of the properties of relict microorganisms is important for solution of such fundamental task as elucidation of the nature of their long-term viability and revealing the mechanisms allowing them to prevent the accumulation of damages of the genetic apparatus.

The studies described in the present work were carried out as a part of a comprehensive research of relict microorganisms isolated from permafrost terrains of different ages and geneses. The goal of the present work at this stage was to study biochemical and other properties of viable culturable microorganisms in ancient permafrost terrains of Mammoth Mountain (Yakutia), which have not been investigated in microbiological studies previously.

The permafrost sampling place and age

Mammoth Mountain is a geologically well-studied and reliably dated exposure of relict frozen terrains extending for 12 km along the left bank of the Aldan River 325 km away from its confluence with the Lena. It presents an outlier of the watershed upland of the Aldan-Amgin interfluvium formed by a series of alluvial deposits of different ages at an apparent power up to 80 m and intensely eroded by the river. The lower part of deposits from which samples were collected for microbiological investigations is formed mainly by sandy sediments with abundant inclusions of fossil Neogene flora whose composition indicates that the accumulation of sediments occurred during the Middle Miocene in the time interval between 11 and 16 million years ago [16].

It is known that frozen terrains existed in this part of Eurasia already in the Early Pleistocene, 1.8 - 2 million years ago [11, 10]. A number of paleoclimatic reconstructions [3, 8] based on the results of palynological, paleogeographical, paleomagnetic, stratigraphic studies and datings reveal the climate cooling, which started in the second half of Neogene with a sharp decrease in average annual temperatures at the boundary of the Late Miocene and the Early Pliocene (5.5 million years ago). The formation of frozen terrains in this region probably began during the Late Pliocene 3.5 million years ago when the average air temperatures for July decreased to $+12 \div +16^{\circ}\text{C}$, and those for January to $-12 \div -32^{\circ}\text{C}$.

One of the main reasons of the fact that relict frozen terrains of Mammoth Mountain did not melt during later periods of geological development is the absence of terrestrial glaciation in this region throughout the whole Quaternary period [8]. The results of some studies [15, 11, 1, 5, 2, 4] allow us to conclude that during complete Pleistocene glaciations of eastern Eurasia and partial ones of Western Siberia this part of Asia was free of ice sheets contributing to the increase of the mean annual temperature of rocks and melting of the previously formed frozen terrains.

The climate, which was more continental as compared with current conditions, along with extremely low annual precipitation (below 250 mm) provided the preservation of Neogene sediments in frozen state throughout the whole Pleistocene. They did not melt during the Holocene climatic optimum either, which is evidenced by the studied cryogenic structure of the upper portion of the Miocene terrain and younger sediments covering it.

In addition, due to the direction of tectonic motions during the Late Cainozoe [10], this territory was not subjected to the effect of sea transgressions and related periodic thawing of relict frozen terrains as was the case in more northern coastal lowlands of Yakutia and Eurasia on the whole. Thus, the age of relict Neogene permafrost terrains of Mammoth Mountain, which did not melt after their formation in the Late Pliocene, probably reaches 3-3.5 million years.

Samples of frozen rocks were collected for microbiological studies in areas of the maximal intensity of river erosion from newly destroyed vertical walls of the exposure (Fig. 1) in its medium and lower parts between 15 and 30 m higher than the river's edge and 40-50 m below the ground surface. According to the data of our routine observations, the rate of thermal erosive destruction of the exposure in sampling places exceeds 4-5 m per year in the upper part and reaches 1-1.5 m in the medium part. Sampling was performed from the depths exceeding the power of the seasonally thawed layer by 1-1.5 m, which prevented previously thawed rocks from getting into the sampling area.



Fig. 1. One of sampling places of frozen rocks with undisturbed structure

Research methods

Under field conditions, samples of frozen rocks with undisturbed structure weighing 4-6 kg consisting mainly of sand with rare interlayers of fine-dispersed grounds and inclusions of organic debris were collected from permafrost terrains using alcohol- and flame-sterilized instruments. The collected monoliths were stored in frozen state at a near-natural temperature (-5°C). Transportation of samples to the laboratory was also carried out without thawing in cold boxes with cooling agents.

Under sterile laboratory conditions, a specimen of approximately 3x4 cm was taken from the center of the sample, placed in alcohol for 2-3 seconds followed by burning in the flame of a spirit lamp. Thus treated material was transferred to an empty sterile Petri dish and left at room temperature (20°C) for 1 hour for further thawing.

Five milliliters of sterile physiologic solution was added to the thawed ground with a pipette followed by thorough mixing. Smears prepared from the obtained soil suspension were Gram-stained [7].

Petri dishes with GRM agar and tubes with GRM broth and minimal synthetic medium were inoculated with 0.1 ml of the obtained soil suspension each. The seedings were incubated at 28 and 37°C. The remaining soil suspension was left at room temperature for 14 days.

Biochemical properties of the strains were determined with traditional methods [14].

Antagonistic properties of isolated strains with respect to different test cultures (*Escherichia coli* 113-13, *Bacillus cereus* 8035, *Staphylococcus aureus* 209) were determined with the agar block method. For this purpose, the studied culture was seeded in the form of a

solid lawn on the surface of GRM agar in Petri dishes and incubated at 28°C for 7 days. Then agar blocks with bacterial lawn were cut with a sterile drill and transferred to the surface of GRM agar preliminarily inoculated with the test microorganisms. The dishes were placed for 24 h into a thermostat at a temperature favorable for the development of the test microorganism. The sensitivity of test cultures to antibiotic substances of the studied strains was determined by the formation of areas with no growth.

The resistance of isolated strains to groups of antibiotics with different chemical composition was determined by the disk method. Aminoglycosides (streptomycin, neomycin), macrolides (erythromycin, oleandomycin), beta-lactams (benzylpenicillin, oxacillin, carbenicillin), and aromatic antibiotics (levomycetin) were used in the work. The studied strains were seeded in the form of a solid lawn onto the surface of AGV medium in Petri dishes. Then disks were placed with sterile pincers onto the lawn surface and incubated in a thermostat for 24 h at 37°C followed by the evaluating the formation of areas with no growth and measuring their diameters. The diameters of areas with delayed growth were compared with boundary values in reference tables [9], and the studied strains were classified under one of three categories of sensitivity: resistant, moderately resistant and sensitive [14, 13].

Results and discussion

One of the main problems of any paleomicrobiological study is the possibility of contamination. A model experiment was conducted to control the penetration of contemporary microbiote or DNA into the collected monolith of frozen rocks. During this experiment, the monolith surface was treated with solution of specially synthesized amplicon (D-loop of mitochondrial DNA 1100 bp long). The results of the analysis of amplicon concentrations at different depths of the monolith after 3 months of storage allow us to speak about practically complete impossibility of penetration of surface pollutants into the collected frozen soil samples with undisturbed structure.

No microorganism colonies, vegetative cells or bacterial spores were not detected by microscopic examination of smears of thawed ground. This indicates their scarcity and, possibly, close contact with ground particles [7]. However, microscopic examinations of frozen soil samples detected individual cells separated by polysaccharide (polypeptide) films and attached to soil particles.

Visible bacterial growth on all media was observed on day 3 of cultivation. On GRM agar, the growth was weak, often semi-transparent. Slight turbidity was observed in liquid media. Small and large bacilli, gram-positive nonsporiferous rods and gram-positive cocci of irregular shape were found in smears.

Then the cultures isolated on solid and liquid media were seeded onto dishes with GRM agar to obtain isolated colonies. The seedings were cultivated at 28 and 37°C for 3 days. Most cultures did not show growth when re-seeded onto a medium. Strains # 6, 13, 14 and 15 yielded a pure culture.

After 2-week incubation of soil suspension at room temperature, gram-positive rods of different sizes and cocci of irregular shape were detected in Gram-stained smears. Soil suspension was seeded according to the above scheme. This indicates that elevated temperature conditions enabled more active metabolism and, probably, division of the cells. Weak growth was observed on all media on day 1 of cultivation, and abundant growth was observed on day 3. Small and large bacilli, gram-positive nonsporiferous rods were found in smears. As distinct from the first variant of the experiment, a greater portion of cultures showed visible growth at re-seeding onto a medium. Strains # 17, 20, 27, 29, 30, 32, 33, 34, 37, 39 and 40 yielded a pure culture.

Some isolated strains had similar cultural and morphological characteristics and were divided into conventional groups.

The largest group was comprised of strains (# 13, 15, 17, 30) producing shiny wrinkled colonies of irregular shape on GRM agar (Fig. 2a). Uniform short gram-positive sporiferous rods with rounded ends were detected in smears. The second typical group included bacterial strains (# 20, 27, 40, 47) forming large round colonies with opaque surface on agar (Fig. 2b).

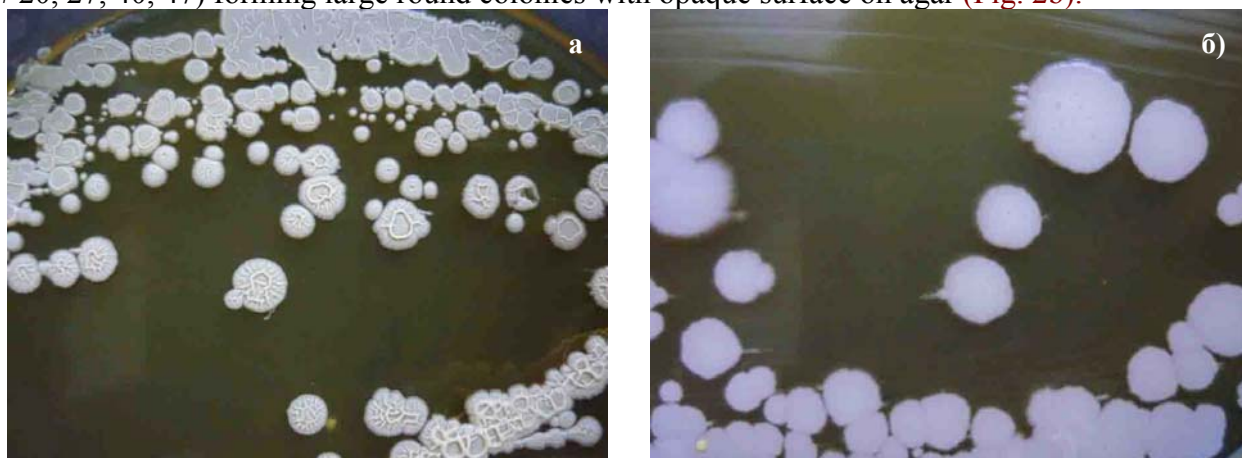


Fig 2. The colony morphology for strains #17 (a) and 40 (b) on GRM agar on day 3 cultivation

This group of strains also differed from the previous one in cell morphology (Fig. 3) and presented long sporiferous rods with lopped ends. According to cell morphology, strain # 29 was similar to the group of sporiferous bacteria, but they somewhat differed in cultural properties (Table 1). The rest of the isolated strains presented gram-positive nonsporiferous rods differing in cell morphology (of regular or irregular shape, with rounded or lopped ends) or cultural properties (smooth or wrinkled, with the presence or absence of pigment).

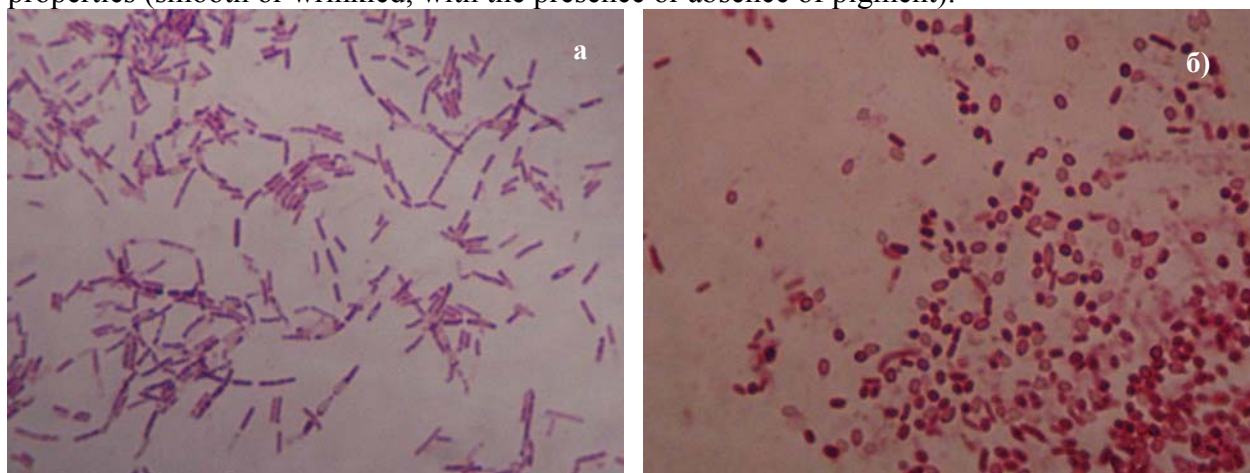


Fig. 3. Cell morphology of strains # 17 (a) and 40 (b) on day 3 of cultivation

The study of biochemical activity of bacteria isolated from permafrost rocks revealed that isolated strains included both aerobes and facultative anaerobes (Table 1). Not a single culturable obligate anaerobe was detected.

Biochemical properties of the strains isolated

Strains	Anaerobic grows	Catalase	Oxidase	Voges-Proskauer test	Citrate using	Nitrate reduction	Hydrolysis			Acid production							Gas production			N ₂ fixation
							Caseinase	Gelatin	Starch	Glucose	Mannit	Arabinose	Xilose	Lactose	Mannose	Sorbitol	Ammonia	Indole	Hydrogen sulfide	
6	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-
13	-	+	+	+	+	+	-	+	-	-	+	-	-	-	+	-	-	-	-	-
14	+	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	+	+	+	+	+	-	+	-	-	+	-	-	-	+	-	-	-	+	+
17	-	+	+	+	+	+	-	+	-	-	+	-	-	-	+	-	-	-	+	+
20	+	+	-	-	+	+	-	+	-	-	-	-	-	-	+	-	-	-	+	+
27	+	+	-	-	-	+	-	+	-	-	-	-	-	-	+	-	-	-	-	+
29	-	+	-	+	+	+	-	+	-	-	+	-	-	-	+	-	-	-	+	+
30	-	+	+	+	+	+	-	+	-	-	+	-	-	-	+	-	-	-	+	+
32	+	+	+	-	-	+	-	+	+	-	-	-	-	-	-	-	-	-	+	+
33	-	+	+	+	+	+	-	+	+	-	+	-	-	-	-	-	-	-	+	+
34	+	+	+	-	-	+	-	-	+	-	-	-	-	-	+	-	-	-	+	-
37	+	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	+	-
39	+	+	+	-	+	+	-	+	-	-	+	-	-	-	+	-	-	-	-	+
40	+	+	-	-	+	+	-	+	-	-	-	-	-	-	+	-	-	-	-	+

All isolated microorganisms were catalase positive, reduced nitrates to gaseous products and did not possess caseinase. The results of the other biochemical tests varied in different strains. Low sachharolytic activity of isolates is noteworthy: only three strains of nonsporiferous rods possessed amylase, and some strains of the 7 proposed sugars used only mannitol and mannose. The study of peptolytic activity revealed the ability of most strains to release hydrogen sulfide at peptone decomposition. None of the studied strains was able to produce ammonia or indole. Most isolates (10 of 15) fixed atmospheric nitrogen and showed abundant growth on Ashby's nitrogen-free medium.

It is interesting to compare biochemical activities of strains combined by us into groups by cultural and morphologic characteristics. Biochemical properties of strains of the first group were practically identical, only strain # 13 differed from the other isolates of this group in the ability to produce hydrogen sulfide and fix nitrogen. The second group also proved to be sufficiently uniform by biochemical activity: differences were noticed only in the ability to use citrate as the only carbon source as well as in hydrogen sulfide production. Strains # 33 and 37 having similar cultural and morphological properties considerably differed by biochemical activity, and therefore, we considered them separately in further investigations.

The study of the range of resistance of isolated strains to different physicochemical factors revealed that the lower temperature limit for growth of most strains was +8°C. Incubation at +2°C did not result in the formation of visible colonies for 2 months. High temperatures (+43°C) inhibited the growth of four strains. Thus, most studied strains grew equally well in the temperature range from +8 to +43°C.

High sodium chloride concentrations had a detrimental effect on most isolated strains. The presence of 6.5% sodium chloride in the medium inhibited the growth of seven strains, and none of the studied strains showed visible growth at 10% sodium chloride concentration in the

medium. The lower limit of pH values at which the growth of isolated cultures was observed varied from 5.0 to 6.0. Resistance to high pH values (11.0) was revealed for nine strains. No growth of isolated cultures was observed at pH 12.0 (Table 2).

When comparing the limits of the strains' tolerance within our groups to different physicochemical factors it was established that the resistance of the strains of the first group was absolutely identical, and the strains of the second group had insignificant differences in sensitivity to 6.5 % NaCl and acidity (pH 5.0).

Table 2

Survival of isolated strains under extreme conditions

Strains	Grow under														
	+2°C	+8°C	+43°C	6.5%NaCl	10%NaCl	pH 4.0	pH 5.0	pH 5.5	pH 6	pH 8.5	pH 9.0	pH 10.0	pH 10.5	pH 11.0	pH 12.0
6	-	+	+	+	-	-	-	+	+	+	+	-	-	-	-
13	-	+	+	+	-	-	+	+	+	+	+	+	+	+	-
14	-	+	-	-	-	-	-	-	+	+	+	-	-	-	-
15	-	+	+	+	-	-	+	+	+	+	+	+	+	+	-
17	-	+	+	+	-	-	+	+	+	+	+	+	+	+	-
20	-	+	+	-	-	-	-	+	+	+	+	+	+	+	-
27	-	+	+	-	-	-	-	+	+	+	+	+	+	+	-
29	-	+	+	+	-	-	+	+	+	+	+	+	+	+	-
30	-	+	+	+	-	-	+	+	+	+	+	+	+	+	-
32	-	+	-	-	-	-	+	+	+	-	-	-	-	-	-
33	-	+	+	+	-	-	-	+	+	+	+	+	+	+	-
34	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-
37	-	+	-	-	-	-	-	-	+	+	+	-	-	-	-
39	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-
40	-	+	+	+	-	-	+	+	+	+	+	+	+	+	-

We have studied antagonistic properties of isolated strains with respect to standard test cultures: *E. coli* 113-13, *S. aureus* 209-P, *B. cereus* 8035 (Table 3). Only one strain (# 29) displayed antagonistic activity with respect to *E. coli*. Strains # 13, 15, 30, 39 inhibited the growth of gram-positive bacteria (*S. aureus* and *B. cereus*). Interestingly that three of them belonged to group I. Strain # 17 also belonging to group I displayed antagonistic activity only with respect to *B. cereus*. Strain # 33 possessed similar activity. Strain # 29 displaying antagonistic activity with respect to gram-negative rods was also active with respect to gram-positive cocci. Strains # 6, 14, 20, 27, 32, 34, 37, 40 did not inhibit the growth of test cultures, and strain # 37 had a stimulating effect on the growth of *B. cereus*.

The study of phenotypic properties (antibiotic resistance) of isolated strains revealed that strains # 6, 15, 17, 30 were sensitive to all the used antibiotics except for levomycetin. Strains # 14, 37, 39 displayed the maximal resistance. The other isolates were characterized by varying

sensitivity to antibiotics of different groups. Neomycin had a strong antibacterial effect with respect to all isolated strains. Levomycetin displayed the weakest biologic activity, only strain # 27 proved to be sensitive to it (Tables 4, 5).

The obtained data significantly differ from the results of similar studies of microorganisms isolated from Antarctic ice cover where high resistance of isolates to most antibiotics was revealed [14]. This can be associated with much younger age of Antarctic ices as compared with ancient permafrost terrains of Central Yakutia as, in spite of taxonomic similarity of microorganisms from natural ices [24], the spectrum of their antibiotic resistance varies depending on isolation places, samples ages and the probability of contact with contemporary microorganisms [23, 25].

Conclusions

Ancient permafrost terrains rocks of the exposure of Mammoth Mountain contain relict viable microorganisms, which were present in permafrost terrains from the moment of freezing of deposits 3-3.5 million years ago.

Culturable bacteria are not numerous and are present in frozen rocks in the form of individual surviving cells, no spores and colonies were detected at microscopic examinations of soil samples.

The degree of taxonomic diversity of microorganisms is not high, and most of them are not available for cultivation, which is confirmed by the cessation of growth of bacterial cells after their transfer to artificial media. No dominant cultures were detected. All isolated strains are gram-positive and differ in an insignificant set of characteristics.

The characteristic features of isolates of Mammoth Mountain allowing us to distinguish them from other relict microorganisms isolated from the youngest permafrost rocks of other regions are high ability for nitrogen fixation, antibiotic sensitivity, insignificant antagonistic properties and ability for active growth over a wide temperature and pH range and under other extreme conditions.

The revealed biological properties of bacteria, along with viability preserved by them over a long period of time, allow us to speak about the need for their more detailed study and the prospects for using isolated strains in biotechnology and medicine including epidemiology.

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Table 3

Antagonistic activity of bacteria (d areas of inhibition, mm)

Test cultures	Strains														
	6	13	14	15	17	20	27	29	30	32	33	34	37	39	40
<i>E. coli</i> 113-13	0	0	0	0	0	0	0	24±0.8	0	0	0	0	0	0	0
<i>S. aureus</i> 209-P	0	30±0.9	0	34±1.0	0	0	0	18±1.2	22±0.9	0	0	0	0	22±1.0	0
<i>B. cereus</i> 8035	0	14±1.3	0	27±1.2	20±1.2	0	0	0	16±0.2	0	22±1.1	0	сгинути	16±1.0	0

Antibiotico-gramm of microorganism strains (d areas of inhibition, mm)

Group of antibiotics in chem. structure	Antibiotic	Straims													
		6	13	14	15	17	20	27	29	30	33	37	39	40	47
amino glycosides	streptomycin	21±0. 3	18±0. 8	18±0. 9	23±0. 6	20±0. 1	25±2. 2	28±1. 8	26±2. 1	17±0. 6	0	12±0. 1	12±0. 8	26±2. 1	29±2. 6
	neomycin	43±1. 5	30±1. 4	36±2. 1	41±3. 9	44±3. 6	37±2. 2	30±2. 4	45±3. 0	45±4. 4	34±2. 8	43±3. 6	37±3. 0	41±3. 4	42±3. 5
macrolides	erythromycin	43±2. 1	12±0. 2	16±1. 6	26±2. 2	27±1. 6	36±4. 0	37±2. 6	28±2. 0	19±0. 6	48±3. 4	0	0	42±3. 8	37±3. 1
	oleandomycin	27±0. 6	13±0. 2	0	20±2. 3	22±1. 8	23±2. 2	25±2. 4	15±1. 7	22±1. 3	0	0	0	30±2. 4	24±3. 5
beta-lactams	Benzilpenicillin	19±0. 5	20±1. 3	0	40±4. 6	32±2. 3	11±0. 2	0	24±0. 6	36±3. 0	32±4. 0	0	0	0	0
	oxacillin	20±0. 8	24±1. 2	0	32±2. 5	30±2. 9	0	11±0. 3	26±0. 8	30±2. 5	30±1. 8	0	0	0	0
aromatic antibiotics	carbenicillin	35±2. 4	41±3. 2	14±0. 7	40±4. 6	45±3. 4	15±0. 7	15±1. 0	39±3. 2	40±3. 7	43±3. 4	25±2. 0	24±1. 8	16±1. 0	17±1. 0
	Levomicetin	0	0	0	0	0	0	16±0. 3	0	0	0	0	0	0	0

Table 5

Antibiotic resistance of microorganism strains

Group of antibiotics in chem. structure	Antibiotic	Strains													
		6	13	14	15	17	20	27	29	30	33	37	39	40	47
aminoglycosides	streptomycin	++	+	+	++	++	++	++	++	+	-	-	-	++	++
	Neomycin	++	++	++	++	++	++	++	++	++	++	++	++	++	++
macrolides	erythromycin	++	-	-	++	++	++	++	++	+	++	-	-	++	++
	oleandomitsin	++	-	-	+	++	++	++	-	++	-	-	-	++	++
beta-lactams	Benzilpenitsilin	++	++	-	++	++	+	-	++	++	++	-	-	-	-
	Oxacillin	++	++	-	++	++	-	-	++	++	++	-	-	-	-
	carbenicillin	++	++	-	++	++	+	+	++	++	++	++	++	+	+
aromatic antibiotics	Levomycetin	-	-	-	-	-	-	+	-	-	-	-	-	-	-

Note: - - resistant strains; + - moderately resistant strains; ++ - sensitive strains.

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Information about the authors:

1. Peterson Alexander M. – kand. biol. Nauk (PhD), associate professor of chair of Microbiology and physiology of Plant, Saratov State University N.G. Chernyshevsky, tel.: 8-904-703-39-57
2. Glinska Elena V. - kand. biol. Nauk (PhD), associate professor of chair of Microbiology and physiology of Plant, Saratov State University N.G. Chernyshevsky, tel.: 8-917-204-99-16.
3. Greva Gennady I. - Doctor of Geological and mineralogical sciences, principal researcher of the Tyumen Scientific Center SB RAS, tel.: 8-926-078-53-30
4. Brushkov Anatoliy V. - Doctor of Geological and mineralogical sciences, Head of the chair of permafrost, Lomonosov Moscow State University, tel.: 9-963-784-44-28
5. Repin Vladimir E. - kand. biol. Nauk (PhD), head of department, Institute of chemical biology and fundamental medicine of SB RAS, Novosibirsk, e-mail: _vasya@mail.ru, tel.: 8-383-363-51-25;
6. Cherniavsky Victor F. - kand. med. Nauk (PhD), Honored doctor of the Russian Federation, FBUZ "[Centers of Hygiene and Epidemiology](#) in the Sakha Republic (Yakutia)", e-mail: poi@fguz-sakha.ru, tel.: 8-4112-22-43-49, mob.: 8-914-223-79-14;
7. Sofronova Oktiabrina N. - Head of the laboratory of natural focal and very dangerous infections, FBUZ "[Centers of Hygiene and Epidemiology](#) in the Sakha Republic (Yakutia)", tel.: 8-4112-32-12-14

Features of the epidemic process of viral hepatitis B in the Altai region in prior to the vaccination and during the immunization

T.V. Safyanova, N.V. Lukyanenko

**GBOU VPO "Altai State Medical University," Russian Ministry of Health
Barnaul**

Hepatitis B – a global problem of public health services in the world.

For the purpose of studying of development of epidemic process of sharp virus hepatitis B the analysis of dynamics of indicators of disease by the given infection in Altay territory during the period with 1986 for 2009 is carried out

As a result of the spent analysis it is revealed: decrease in disease by an acute hepatitis B in 2009 to a maximum level 1996; presence of return statistically significant correlation dependence between disease of the population of an acute hepatitis B and coverage by preventive inoculations against the given disease, with more expressed dependence among adult population till 55 years; presence of return statistically significant correlation dependence between disease of an acute hepatitis B and coverage by preventive inoculations of children till 17 years; change of age structure of ill children till 17 years towards decrease B relative density of children of

preschool age and increase B a share of children of school age; excess of an indicator of disease by an acute hepatitis B among city dwellers in relation to agricultural population at equal coverage by preventive inoculations of townsmen and villages.

Keywords: acute hepatitis B, epidemiological features, vaccination.

Introduction. Approximately 350-400 million people worldwide are infected with hepatitis B, despite the availability of vaccines. Hepatitis B infection has a 100-fold greater than the degree of infection with human immunodeficiency virus (HIV). Hepatitis B is in tenth place among the most common causes of death worldwide [1, 2, 3].

Materials and methods. The subject of the research were the main patterns of development of the epidemic process of acute viral hepatitis B taking into account the ongoing immunization against the disease in the Altai region.

A retrospective analysis of the incidence of acute hepatitis B was done. The total number of observations for patients with hepatitis B in the Altai Territory - 15 252, including cases of acute form - 13 615.

The basis of methods for studying patterns of development of the epidemic process of acute hepatitis B incidence of this infection control is comprehensive epidemiological study using statistical and laboratory methods.

In the process of study online and retrospective analysis of medical-demographic indicators, levels and dynamics of long-term morbidity, region's population vaccination against hepatitis B was carried out.

The research materials were subjected to statistical analysis using parametric and nonparametric tests. Statistical analysis was performed using the package STATISTICA-6 and features MS Excel. Checking normality test was conducted using the Shapiro-Wilke. Mean sample values of quantitative traits are given in the text as $M \pm m$, where M - mean sample, m - standard error of the mean. To identify statistical relations we used the method of correlation-regression analysis. Comparison of frequencies studied traits were performed using the statistical criterion χ^2 . The critical level of significance when testing the null hypothesis was assumed to be 0.05. To assess the statistical significance of differences between samples portions, the method of angular transformation of Fisher (L. Sachs, 1976). In all procedures, statistical analysis of the critical level of significance was taken as $p 0.05$.

Results and discussion. In order to study the development of the epidemic process of acute viral hepatitis B an analysis of the dynamics of the incidence of this infection in the Altai region in the period from 1986 to 2009. The data are presented (Fig. 1).

From these data it is clear that the development of the epidemic process of viral hepatitis B in the Altai region in 24 years we can distinguish several periods, each of which accounted for 5-6 years. The first - from 1986 to 1991, Characterized by a general tendency to reduce the incidence rate of attrition for the period amounted to 33% (average - 6.6% per year). Thus, the incidence has decreased from $18,2 \pm 0,26$ per 100 thousand population in 1986 to $12,2 \pm 0,67$ in 1991 ($p < 0,05$).

Second period - from 1992 to 1996, Characterized by rapid growth of incidence of acute hepatitis B. In comparison with the 1991 level (a measure of per 100 thousand population - $12,2 \pm 0,67$) in the five-year period 1992-1996. Incidence increased to 4.37 times the maximum level $53,4 \pm 1,41$ per 100 thousand population in 1996 ($p < 0,00001$) (growth rate - 337%, averaging 67.5% per year). The maximum increase was registered in 1995, when the incidence increased in comparison with the previous year by 2.1 times (annual growth rate was 112%).

During the subsequent five-year period (1997-2001 gg.) Incidence varies in different directions with a general tendency to reduce it. Until 2000, the recorded decline in incidence (for 1997-2000. 35%, the average rate of decline was 8.8% per year), and in 2001 - an increase of 6.6%. As a result, the incidence in 2001 decreased relative to the 1996 level of 31% from $53,4 \pm 1,41$ to $36,9 \pm 1,18$ per 100 thousand population ($p < 0,01$).

Later, in 2002, the dynamics of incidence of acute hepatitis B had an unswerving tendency to decrease and was characterized by high rates of attrition. So in 2002 the incidence rate decreased by 1.9 times to the level of 19.7 per 100 thousand population, the rate of decline was 46% in 2003 - 1.4 times to 13.60 / 0000 (30% decrease), in 2004 - the incidence has decreased by another 21% to 10.80 / 0000 (which is below the minimum value of the previous 16 years - $12,2 \pm 0,67$ in 1991). In 2009, the incidence was 3.40 / 0000, which is below the 2001 level - $36,9 \pm 1,18$ - to 11-fold ($p < 0,00001$). In general, for the period 2002-2009 incidence decreased by 91%, the average rate of decline was 11.4% per year.

Despite the positive trends in the incidence of acute hepatitis B in the Altai Territory, the rate of loss still lagged behind the nationwide figures. In 2002, the incidence rate in the region corresponded to the average for the Russian Federation - 19.70 / 0000, and since 2005 has significantly exceeded the national average.

During the period 2002-2008 in the Altai region, cases of acute hepatitis B decreased by 64.5%, while in the whole of the Russian Federation over the same period - up to 80%. So in 2005, the incidence in the Altai region was 28% higher than the national average ($11,0 \pm 0,65$ and $8,6 \pm 0,08$ per 100 thousand population, respectively, $p < 0,01$), in 2006 - on 34,3% ($9,4 \pm$

0,61 and $7,0 \pm 0,07$ per 100 thousand population, respectively, $p < 0,01$), in 2007 - the difference was 73,6% ($9,2 \pm 0,6$ in the province, $5,3 \pm 0,06$ for Russia to 100 thousand population, $p < 0,001$), and in 2008 already 75% ($7,0 \pm 0,53$ and $4,0 \pm 0,05$ 100 thousand population, respectively, $p < 0,001$).

In reducing the incidence of hepatitis B in the Russian Federation has played a significant role timely immunization of the population, including within the framework of priority national projects in health care. In the Altai region because of lack of coverage of population reduction in the incidence occurred more slowly.

Throughout the period of morbidity among the adult population significantly higher than the figure in a cohort of children under 17 years (Fig. 2). The maximum level for the period was registered in 1996 - $64,4 \pm 1,840 / 0000$ for adults and $14,28 \pm 1,780 / 0000$ in children under 17 years (rate per 100 thousand). Between 1997 and 2000 the incidence of adults decreased by 1.5 times (from $64,4 \pm 1,84$ up to $41,9 \pm 1,480 / 0000$, $p < 0,01$), children - in 4.2 times (from $14,28 \pm 1,28$ to $3,42 \pm 0,870 / 0000$, $p < 0,01$). In 2001, the incidence rate was $43,8 \pm 1,25$ for adults and $5,65 \pm 1,12$ for children under 17 years per 100 thousand ($p < 0,000101$).

During the study period the incidence structure has changed in the direction of reducing the proportion of preschool-age children and increase the proportion of school-age children (in the direction of increasing age of the children suffer from acute hepatitis B). This is directly related to the organization of immunization against hepatitis B, these age contingents: implementation of the national immunization schedule - the children of the first year since 2001, implementation of the national project - children under 17 years old, who did not ill and not vaccinated earlier, in 2006.

The incidence of acute hepatitis in urban population during the study period significantly exceeded the incidence of rural population in the period average of 3.2 times. Coverage of preventive vaccination in urban and rural population in 2007-2009. was almost the same level. Immunization against hepatitis B in the Altai Territory began in 1999 as a realization of the "school-based programs." Mass immunization of infants was introduced in 2001, since 2006 implemented national project "Health" segment on "Additional immunization of the population" - a mass vaccination of all persons under the age of 55.

Correlation analysis (Fig. 3) revealed a statistically significant inverse correlation between the incidence of people with acute hepatitis B coverage and preventive vaccination against the disease ($r = -0,65$, $p < 0,05$) with a more pronounced dependence in the adult population to 55 years found an inverse strong correlation between these parameters ($r = -0,92$, $p < 0,05$).

In general, for the period 2005-2009 coverage of hepatitis B adult population up to 55

years increased 10.9 times from 7.6% to 82.5% in the incidence of adults with acute hepatitis during the same period decreased by 3.4 times from $13,5 \pm 0,65$ to $4,0 \pm 0,37$ per 100 thousand population ($p < 0,0001$).

Correlation analysis also revealed an inverse statistically significant correlation between the incidence of acute hepatitis B and coverage of preventive vaccinations of children under 17 years ($r = -0,60$, $p < 0,05$).

Conclusions.

As a result of a retrospective analysis of hepatitis B in the Altai region for 1986-2009 years revealed the following:

- decrease incidence of acute hepatitis B in 2009 to the maximum level of 1996 by 16 times (94%) with an increase in the rate of decline since 2002;
- an inverse statistically significant correlation between the incidence of people with acute hepatitis B coverage and preventive vaccination against the disease ($r = -0,65$, $p < 0,05$) with a more pronounced dependence in the adult population up to 55 years found an inverse strong correlation between indicators ($r = -0,92$, $p < 0,05$);
- an inverse statistically significant correlation between the incidence of acute hepatitis B and coverage of preventive vaccinations of children under 17 years of age ($r = -0,60$, $p < 0,05$) with the strongest correlation in the age groups 3-6 ($r = -0,88$, $p < 0,01$) and 7-14 ($r = -0,64$, $p < 0,05$) years.

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Information about the authors:

Safyanova Tatiana - senior lecturer in epidemiology GBOU VPO AGMU Russian Ministry of Health, PhD., candidate for the degree of Doctor of Medicine, E-mail: tysya_095@mail.ru

Natalia V. Lukyanenko - Head of the Department of Epidemiology GBOU VPO AGMU Russian Ministry of Health, professor.

R.G. Savvin, S.G. Nikitina, S.S. Maksimova, R.S. Nikitina

**DETECTABILITY OF HEPATITIS B AND C MARKERS IN VILIUISK
ENCEPHALOMYELITIS AND DYSCIRCULATORY ENCEPHALOPATHY PATIENTS**

Summary. Markers of hepatitis B and C have been revealed in Viliuisk encephalomyelitis (VE) and dyscirculatory encephalopathy (DE) patients. Anti-HB-cor has been more frequently found in VE and DE patients than in control group. Marker of hepatitis C (a-HCV) has been more frequently found in VE patients than in DE patients and control group.

Key words: markers of hepatitis, Viliuisk encephalomyelitis, dyscirculatory encephalopathy.

During studying of ethiology, epidemiology and clinics of Viliuisk encephalomyelitis (VE) proofs of existence of exogenous environmental factor have been received that gives the basis to refer VE to polyfactorial diseases. The analysis of sequence of VE occurrence in families and settlements of the central Yakutia supports the assumption of the role of some virus agent in transfer of disease [1].

The establishment of the fact of HCV-infection replication outside of a liver (in tissues of lymphoid and not lymphoid origins) allows to give up the idea of hepatocytes as the only place of duplication of a virus that helped, in particular, to understand pathogenesis of polysystemic lesions at HBV and HCV - infections and to consider viral hepatitis not only as infectious disease of a liver but also as systemic generalized viral infection that complicates duly diagnostics and treatment of chronic hepatitis. As the hepatitis B (HBV) has affinity to various tissues it more often affects a liver, however, DNA and proteins of the virus are also found out in kidneys, spleen, pancreas, skin, bone marrow mononuclear cells of peripheral blood, etc. [2]. The latest Canadian research showed that in 13% of people suffering chronic hepatitis C that made 300,000 of inhabitants of Canada, problems with health of neurologic character were also observed. Other research revealed that the virus of hepatitis C is capable to break blood barrier of

a brain. Chris Power, the doctor of Research Faculty of the Canadian University and his team of scientists decided to prove this theory in practice by carrying out some experiments with human corpses.

«The virus was found in the brain of the died patient who during lifetime suffered hepatitis C» - said Dr. Power who also noted that in normal conditions of an organism it is very difficult to any type of virus or infection to cross blood barrier of a brain. On the basis of this discovery the researchers made three new and basic statements. Firstly, the virus of hepatitis C injures those neurons in a brain which are responsible for movement functions, memory and concentration of attention of a person. Secondly, the virus is capable to initiate inflammatory process in a brain which promotes damage of a great number of neurons. And, thirdly, the virus interferes with realization of natural process in brain cells known as autophagy in which cells themselves get rid of undesirable toxic proteins. So, the injured cells of a brain accumulate a plenty of these toxic proteins causing development of brain disorders. «In medical practice have been already known for a long time the cases when patients infected by hepatitis had memory disorders and weak concentration of attention that very much complicated their diagnosis» - Dr. Power informed. Now there is some understanding of the reason of these neurologic symptoms that will essentially help to develop future methods of treatment of people suffering hepatitis. This is very significant discovery as for the first time it is proved in practice that virus of hepatitis can infect and injure brain cells [3].

The purpose of research is: to reveal markers of virus of hepatitis B and C in Viliuisk encephalomyelitis (VE) patients and in patients with dyscirculatory encephalopathy (DE) passed hospitalization in FSSE «Institute of Health».

Material and methods: During 2005-2010 from 139 in-patients markers of hepatitis B and C were surveyed in 127 (91.4%) of them. Average median age of the investigated people was 45 years (25-th and 75-th percentiles – 32.3 and 52.8 accordingly). The age range of the investigated people was within the limits of 17 - 79 years (Fig.1). In sexual structure women (63.9 %) prevailed, men made 36.1 %. Average median age did not statistically significantly differ according to sex (46 - in women, 42 - in men; $p=0.36$) (Fig.2). The share of VE patients made 24.4 %; the other 75.6 % were DE patients. Average median age did not depend on the diagnosis and made 46 years in VE patients; 44.5 years – in DE patients ($p = 0.11$) (Fig.3). Serologic research was carried out in immunologic laboratory of FSSE «Institute of Health» (ФСБОК 10834-01/06). Using test systems of SPU «Vector-Best» were revealed: markers of hepatitis B - HBsAg, antiHBc IgG, according to clinical indications - antiHBcor IgM, HBeAg, antiHBs; hepatitis D - anti-HDV in HBsAg-positive; hepatitis C - anti-HCV. The control group

consisted of samples of rural population of the Republic of Sakha (Yakutia) in quantity of 9167 persons. Statistical processing of results was made using the program MedCalc.

Results and discussion: frequency of HBsAg detection in investigated groups did not statistically significantly differ (14.7 % in VE patients; 4.5 – in DE patients and 5.7 - in control group). Marker Anti-HB-cor was more often found in VE and DE patients than in control group (81.8 and 60.9 % accordingly against 15.9). The marker of virus of hepatitis C (a-HCV) was more often revealed in VE patients than in DE patients and control group (17.6 % against 2.6 and 2.3 accordingly) (Table).

Epidemiological anamneses from the case records of VE and DE patients were also studied. In 19 patients (48.7 %) there were many parenteral interventions (those being often/long ill, receiving stationary and out-patient treatment, operative interventions, etc.); 4 (10.2 %) patients marked family contact to patients with chronic hepatitis B. In 16 (41 %) cases the risk factor of infection was not established within epidemiologically significant period.

Conclusions: Thus, the obtained data allow to assume that parenteral viral hepatitis B and C are opportunistic or contaminating infection in VE and DE cases. The further studying of the given problem will allow to clear up true influence of parenteral viral hepatitis on patients with neurodegenerative pathology.

Fig.1 Average age of VE and DE patients

Fig.2 Average age of patients according to sex

Fig.3 Average age of patients according to diagnosis

Table

Detectability of hepatitis B and C markers in the investigated groups of patients

		VE		DE		Control group	
		abs.	%	abs.	%	abs.	%
HBs-Ag	Positive	5	14.7	4	4.5	524	5.7
	negative	29	85.3	84	95.5	8643	94.3
a-HBcor	Positive	18	81.8	42	60.9	163	15.9
	negative	4	18.2	27	39.1	857	84.1
a-HCV	Positive	6	17.6	2	2.6	92	2.3
	negative	28	82.4	76	97.4	4000	97.7

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Savvin Revorii Grigorievich – PhD., the head of the group of epidemiology and monitoring of chronic diffuse diseases of liver, Institute of Health, North-East Federal University,

revorii_savvin@mail.ru;

Nikitina Svetlana Georgievna – junior research worker of the group of epidemiology and monitoring of chronic diffuse diseases of liver, Institute of Health, North-East Federal University, Svetlana_nik77@mail.ru;

Maksimova Svetlana Semenovna - senior research worker of the group of epidemiology and monitoring of chronic diffuse diseases of liver Institute of Health, North-East Federal University, Svetlana.maksimo@mail.ru;

Nikitina Raisa Semenovna – the head of clinical department, Institute of Health, North-East Federal University, nikitina_raisa@mail.ru;

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V.N. Makarov

Mineral nitrogen compounds in the environment of Yakutia and the risk of endemic diseases

In view of the toxicological role of nitrogen, the distribution of its mineral compounds in the environment of Yakutia is examined. The distribution of nitrogen compounds – nitrates, nitrites and ammonium – was studied in various components of the Yakutia's environment, including the atmosphere, snow cover, surface water and groundwater. Data are presented on the atmospheric deposition fluxes of nitrogen to the landscapes. The need for control of human exposure to nitrogen compounds is substantiated.

Keywords: Environment, nitrogen, mineral compounds, toxicants, health effects

Introduction

Nitrogen is an ecologically and vitally important, but strongly toxic element. N is the only chemical element which is a constituent of all amino acids, proteins, nucleic acids, enzymes and vitamins (Zbarsky et al., 1972) and thus is essential for all living organisms, ranging from viruses and microorganisms to higher organisms such as animals and humans.

Accumulation of nitrogen compounds in the landscape components had long been conceived only as an indirect indicator of domestic pollution. The attitude to the problem of elevated concentrations of nitrogen, especially nitrates, changed radically when their toxicological role was established.

Review of medical data

Food or fodder that is rich in nitrates, as well as high nitrate drinking water can cause gastroenteric upsets in humans and animals [Blinov, 1984, Vasyukovich, Krasovsky, 1979]. Elevated concentrations of nitrogen compounds have direct adverse effects on aquatic organisms. It is known, for example, that ammonium nitrogen causes damage to gills, erythrocytes, kidneys and liver of fish [Stanley, Smits, 1956]. In the body of humans and animals, nitrate is reduced to nitrite which oxidizes the divalent iron in the hemoglobin molecule to the trivalent form. The resulting methemoglobin is unable to reversely bind oxygen, which leads to poisoning of the organism causing asymptomatic (at methemoglobin level of 10%) or symptomatic (at levels between 20 and 50%) cyanosis [Volkova, 1976; Ivanov *et al.*, 1975].

In high concentrations N causes severe diseases in children, such as metaglobinemia, and cardiac, metabolic and mutagenic disorders in adults.

Nitrate nitrogen in water at concentrations below 10 mg/l does not cause any increase in methemoglobin levels in the blood. This level increases at higher nitrate nitrogen concentrations, and the younger is the person, the greater is the increase. Based on the evidence for health effects of nitrates, Russia has adopted a maximum permissible level (MPL) for this form of nitrogen of 10 mg/l (45 mg/l as NO_3^-).

Methemoglobinemia in infants occurs almost exclusively in rural areas where communities obtain their water from lakes [Mukha *et al.*, 1965; Petukhov, Ivanov, 1970]. Data on methemoglobinemia incidence in the Republic of Sakha (Yakutia) are very limited. However, the high nitrate concentrations in drinking water, as well as the elevated groundwater concentrations in all rural communities of the region where lakes are used for water supply suggest the potential for the occurrence of this disease. It is therefore necessary that the human intake of nitrates from drinking water, as well as from other food products, especially milk and potato, is monitored by the health departments of the Republic.

The toxicological role of nitrates in drinking water and food is great. It is related, first, to the increasing levels of nitrates in water, and, second, to their potential to cause cancer in humans by forming N-nitrosamines, a large class of carcinogenic substances which includes over 100 compounds causing malignant tumors in all experimental animal species, including primates [Bogovsky, 1979]. Although there is no conclusive evidence of human carcinogenicity of N-nitroso compounds, it is very unlikely that humans are resistant to the carcinogenic effect of these compounds [Bogovsky, 1980]. The danger of N-nitroso compounds is that they occur everywhere in the environment and, unlike other carcinogens, they can form from non-carcinogenic precursors – nitrates, nitrites and amides always present in the biosphere

[Bogovsky, 1979; 1980, *Ilnitsky, Vlasenko*, 1977]. The most serious health risk is posed by soluble nitrogen compounds, of which nitrates are most mobile and stable. A direct relationship between cancer rates and nitrate levels in drinking water was found in a number of countries, including Chili, USA, and Japan [*Zaldivar*, 1977]. A close correlation was observed between the amount of fertilizers used and the mortality from stomach cancer [*Armyjo, Couison*, 1975; *Zaldivar*, 1977].

Besides nitrates, humans are exposed to nitrites and ammonium which are more hazardous for health. It is therefore important to study the distribution of nitrogen compounds in the environment, as well as to control combined exposure to various forms of nitrogen.

Results of geochemical investigations

The distribution of mineral nitrogen compounds was studied in various components of the Yakutia's environment, including the atmosphere, snow cover, and natural waters (Makarov, 2010).

Table 1 gives data on emissions of nitrogen oxides in Yakutia from stationary sources.

Table 1

Atmospheric emissions of nitrogen oxides from stationary sources in Yakutia, kt (Public Report..., 2010)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
NO _n	24.8	24.5	25.3	24.4	23.2	21.9	23.6	24.0	30.8	30.0
Number of stationary source facilities	285	284	303	294	306	329	359	398	398	405

According to the statistical data, nitrogen oxide emissions in Yakutia remained nearly constant over the 8-year period from 2000 to 2007 (22-25 kt) and increased by 20-24 % in 2008-2009, reaching about 30 kg per person per year.

Atmospheric concentrations of nitrogen compounds in the urban areas are well known owing to ecological monitoring. Table 2 gives average concentrations of nitrogen oxides (NO and NO₂) for selected cities of Yakutia.

Table 2

**Annual mean atmospheric concentrations of nitrogen compounds for Yakutia's cities,
mg/m³ (Public Report..., 2007)**

City	Year	NO ₂	NO	ΣN
Mirny	2002	0.038	0.030	0.026
	2003	0.030	0.026	0.021
	2004	0.038	0.045	0.033
	2005	0.033	0.088	0.051
	2006	0.087	0.079	0.063
Neryungri	2002	0.050	0.020	0.024
	2003	0.065	0.020	0.029
	2004	0.061	0.020	0.028
	2005	0.057	0.020	0.026
	2006	0.055	0.017	0.025
Yakutsk	2002	0.018	0.009	0.009
	2003	0.025	0.009	0.012
	2004	0.023	0.020	0.016
	2005	0.024	0.015	0.014
	2006	0.028	0.011	0.013
MPL _{daily average}		0.040	0.060	

The average concentrations of nitrogen compounds in the atmosphere of Yakutsk are far below the limits set by the ambient air quality standards. However, the atmospheric levels of nitrogen dioxide in Yakutsk have increased by 56%, from 0.018 to 0.028 mg/m³, between 2002 and 2006. High levels of pollution are observed in Mirny and Neryungri where atmospheric concentrations of nitrogen dioxide exceed the daily average limit. In Mirny the nitrogen dioxide concentrations nearly doubled between 2002 and 2006.

The distribution of atmospheric deposition of mineral nitrogen compounds in Yakutia is shown in [Fig. 1](#).

As is seen from [Fig. 1](#), the nitrogen fluxes in the region range from 1 to 30-40 kg/km² yr. There is some pattern in the regional distribution of nitrogen-compound fluxes. The lowest deposition levels (<5 kg/km² yr) observed in most of Yakutia are almost entirely determined by natural concentrations of nitrogen compounds in air and represent background levels for the areas located more than 1,000 km away from the industrial areas. The atmospheric nitrogen fluxes are higher (5-20 kg/km² yr) in central Yakutia (see [Fig. 1](#)), while the maximum values (20-30 kg/km² yr) are observed in the south-western part of the region bordering on the Irkutsk Province.

The predominant forms of mineral nitrogen in snow water are nitrate and ammonium nitrogen, and the proportion of mineral nitrogen forms (NO₃⁻ > NH₄⁺ > NO₂⁻) in snowcover is similar in all landscape types over Yakutia.

Most of the atmospheric deposition of mineral nitrogen compounds occurs during summer months (Fig. 2).

From the ecological standpoint, it is important to note that the concentrations of oxygen forms of nitrogen, nitrates and nitrites, in the snow cover of the urban areas are only one order of magnitude lower than the standards, while the concentrations of ammonium-nitrogen exceed the MPL in Neryungri, Yakutsk and Mirny.

Mean concentrations of nitrogen compounds in river water during the summer low-flow period vary from 0.053 in eastern Yakutia to 0.495-0.514 mg/l in western and southern Yakutia (Table 3).

Table 3

**Mean concentrations of nitrogen compounds in Yakutia's rivers
(summer low-flow period), mg/l**

Region	N(NO ₃ ⁻)	N(NO ₂ ⁻)	N(NH ₄ ⁺)	N _{tot}	Number of rivers
<i>Central</i>	0.068	0.002	0.041	0.111	4
<i>Eastern</i>	0.040	0.001	0.017	0.053	7
<i>Western</i>	0.066	0.022	0.406	0.495	6
<i>Southern</i>	0.078	0.003	0.433	0.514	4
<i>Northern</i>	0.179	0.003	0.153	0.335	5
MPL	10.0	1.0	2.0	-	-

The highest river water concentrations nearly approaching the maximum permissible levels are observed for the toxic ammonium ions: 1.16 mg/l for the Nyunyali River in the Talakan oil and gas deposit area, 1.31 mg/l for the Iengra River, and 0.84 mg/l for the Telgespit River in the Middle Botuoba oil and gas deposit area.

In recent years, accumulation of more toxic nitrogen compounds, NH₄⁺ and NO₃⁻, in waters has been detected, resulting from oxidation of NO₂⁻, as well as from livestock waste (50-360 mg/l NH₄⁺). For example, measurements of suprapermafrost water that drains a cattle farm in central Yakutia showed an ammonium concentration of 60 mg/l.

Many streams that are not recharged by groundwater due to the occurrence of permafrost freeze over in winter and can not serve as a dependable source of water. Most rural communities are therefore located near lakes. As a rule, lakes used for water supply rapidly degrade under the combined effect of natural and anthropogenic factors, resulting in poor water quality. In central Yakutia, for example, the majority of lakes in the alas and taiga landscapes are situated near communities with population of 500-1000 and are used for water supply. These lakes are enriched with the ammonium and nitrite compounds of nitrogen. Water in most lakes is

dominated by the reduced ammonium forms of nitrogen (up to 96-98% of total nitrogen), and their concentrations often exceed the maximum permissible levels (Table 4).

Table 4

Mean ammonium concentrations in Yakutia's lakes, mg/l

Lake	NH ₄ ⁺
Nyurbachan	2.0
Syultsy	2.1
Kyulyukyan	1.6
Chabyda	7.2
Bere	2.65
Kyures	2.6
Tegulken-Kyele	0.58
Yakutsk area	14.4
MPL	2.6

Little information exists on nitrogen levels in groundwater and the data available mainly comes from subpermafrost water studies for water supply purposes. Table 5 gives some data on groundwater nitrogen concentrations for several locations in Yakutia.

Table 5

Concentration of nitrogen compounds in groundwater in Yakutia, mg/l

Location	NH ₄ ⁺	NO ₃ ⁻	NO ₂ ⁻
Ulakhan-Taryn Springs	1.8	0.01	0.01
Bulus Springs	0.2	0.69	0.01
Mir diamond mine, suprapermafrost water	0.05	20.6	0.10
Yakutsk, subpermafrost water, 165 m	0.23	0.001	0.001
Talkan, subpermafrost water, 135 m	0.05	0.36	0.003
Jubilee diamond mine, subpermafrost water	<60.0	no data	<0.01
Mir diamond mine, subpermafrost water	16.4	3.1	0.20
Chayanda gas deposit, 1500 m	60.0	no data	<0.01
MPL	2.6	45	3.3

Although permafrost acts as an impermeable barrier, movement of nitrogen compounds down to deep, subpermafrost aquifers has been observed in several areas of Yakutia, mainly those underlain by discontinuous or sporadic permafrost.

Discharges from industrial facilities are an additional source of anthropogenic nitrogen. Waters in the storage ponds and tailings of mines have elevated concentrations of nitrogen-containing ions (Table 6).

Table 6

Concentration of nitrogen compounds in mine discharges, mg/l

Mine	pH	TDS	NH ₄ ⁺	NO ₃ ⁻	NO ₂ ⁻
Mir diamond mine (the Tymtaidakh drainage water collector)	7.1	105 000	0.05	747	0.5
Sarylakh mine, tailings pond	6.9	2 950	8.4	3.9	0.07
Kuranakh mine, tailings pond	9.5	150	2.2	19.1	1.7
Gebariki-Khaya mine	6.8	136	2.5	9.1	0.46
Nera-Talalakh, waste waters	6.1	312	63.0	4.7	0.11
MPL	6.5-8.5	1 000	2.6	45	3.3

Conclusions

This study has shown that high concentrations of mineral nitrogen compounds are widespread in the components of the Yakutia's environment: the atmosphere, snow cover, and natural waters.

The large inputs of mineral nitrogen compounds into the lakes, streams and aquifers used for water supply require assessment in terms of health safety. Local residents may be exposed not only to nitrates, but also to more hazardous nitrites and ammonium. It is therefore important to study the environmental distribution of nitrogen compounds, as well as to control combined exposure to various forms of nitrogen.

A more detailed study is required on relationships between cancer and the environmental geochemistry. Integrated investigations should be undertaken to determine the occurrences of nitrates, nitrites and N-nitroso compounds in food and landscape components. Special attention should be given to the synergetic effect of nitrates and toxic metals which has received little study in the areas of Yakutia subjected to urban (Pb, Zn, Cu, Cd, Ti, Hg), industrial (As, Ag, Cu, Pb, Zn, Mo) and agricultural (Cu, Zn, Cr, Pb, Co, Mn) pollution.

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Fig. 1. Atmospheric nitrogen deposition levels, kg/km² yr

Fig. 2. Atmospheric deposition of mineral nitrogen compounds (Yakutsk, 2010)

ABOUT THE AUTHOR

Vladimir N. Makarov
Dr. Sci. in Geology & Mineralogy, Professor
Head, Laboratory of Permafrost Geochemistry
Melnikov Permafrost Institute SB RAS
Merzlotnaya St., 36, Yakutsk, Russia 677010
Phone: 4112-390826
Fax: 4112-334476
makarov@mpi.ysn.ru

O. A. Golikova, E.B. Romantsova, A.F. Babtseva, O. B. Prihodko

Dynamics of allergic diseases in children of RS (Y) at the present stage

В статье отражена динамика распространенности аллергических заболеваний в зависимости от возраста детей и экологических условий проживания.

Ключевые слова: аллергические заболевания, распространенность, дети, возраст, экология.

In this article dynamics of prevalence of allergic diseases depending on age of children and ecological living conditions is shown.

Keywords: allergic diseases, prevalence, children, age, ecology.

Kapustina T.A., Markina A.N., Belova E.V.

**CHLAMYDIA CONTAMINATION IN UPPER RESPIRATORY TRACT IN
KRASNOYARSK REGION POPULATION**

State Scientific Research Institute of Northern Problems of
Siberian Division of Russian Academy of Medical Sciences, Krasnoyarsk, Russia
(headed by RAMS corresponding member Mr.V.T.Manchuk)

Abstract. The article shows the data on high prevalence of Chlamydia contamination in upper respiratory tract in different populations (in organized population, both children and adults, in patients with acute and chronic inflammatory diseases of nose, paranasal sinus and nasopharynx). Authors show species structure in identified Chlamydia in accordance with age and gender of the examined subjects.

Keywords: Chlamydia infection of upper respiratory tract, respiratory Chlamydiosis.

Relevance of the study. Researchers of the world during two last decades observe noticeable changes in the spectrum of the main agents of inflammatory diseases in upper respiratory tract with the increase of etiological meaning of intra-cellular infection, including Chlamydia [4, 8, 15 and many others].

The results of many research, devoted to founding and studying different types of Chlamydia, encouraged considerable shift of points of view of doctors and scientists on Chlamydia infection. It has been regarded not only as the agent of urinogenital system diseases. Numerous research allowed to define etiopathogenic meaning of Chlamydia infection in the nascency of diseases in central and peripheral nerve system, locomotor, cardio-vascular and bronchopulmonary systems, digestive tract, eyes [2, 6, 7, 11, 13, 14 and many others].

Since early 90-s Chlamydia as etiological factor attracted attention of Russian and foreign E.N.T. scientists. Unfortunately, the researchers focused mainly on the subjects, who are medical patients, but not the other groups of the population. Besides, the research is few and to great extent they are aimed only at studying the frequency of Chlamydia under different ENT pathology and Chlamydiosis different clinical signs. In many cases the results of the research show contradictory character. This opinion is based on large diapason in variance of infection frequency under different ENT pathology - from 7% to 74.4% [1, 3, 5, 10, 12].

The above-mentioned circumstances have caused the aim of the present research, namely determination of the prevalence and peculiarities of signs in Chlamydia contamination of upper respiratory tract in different segments of population.

Subject and methods of the research.

The subject of the research is organized urban population (Numbering 1 329 subjects. Out of them: 846 children and 483 adults) and ENT upper respiratory tract patients (Numbering 498 subjects. Out of them: 246 children and 252 adults) in ages from 3 to 60 years. The formation of samples of organized population was performed using the lists of children and adult of collective groups in different institutions (response - from 84.1% to 89.5%). Representative size of groups was determined by V.I.Paniotto (1982) [9] technique. Set samples were formed according to the presence/absence of respiratory Chlamydiosis. They were comparable by gender and age.

In order to study the frequency of Chlamydia infection in ENT, we examined out- and in-patients of ENT Department of SSRI NP SD RAMS, who received treatment because of inefficiency of treatment under polyclinics conditions. Formation of main and control groups with different diseases was performed by the method of sequential accumulation of patients up to

the number necessary for receiving statistically meaningful characteristics for the presence or absence of Chlamydia infection. The compared groups were homogenous in age and gender.

Laboratory methods of research included identification of: Chlamydia trachomatis (CT) and Chlamydophila pneumoniae (CP). We used single method to identify Chlamydia in organized population, namely direct immune fluorescent analysis. Verifications of Chlamydia infection in the patients were performed by simultaneous implementation of 3 tests: direct immune fluorescent analysis (to reveal Chlamydia antigens), polymerase chain reaction (to reveal Chlamydia DNA) and immune enzyme analysis (to reveal Chlamydia antigens). Immune fluorescent analysis was carried out with “ChlamySlide” (“Galart” - Diagnostikum) test system. “VectorChlamy-DNA-amli” and “ChlamBest-strip” (“Vector-Best”) were used for polymerase-chain reaction and immune enzyme analysis.

To describe binaural signs we calculated their relative frequencies and 95% confidence interval (95% CI). Estimation of significance of differences between main indices was carried out by Student’s t-criterion, Fisher’s exact criterion and χ^2 criterion. The quantity for error maximum probability of 1 genus (p) was accepted as index equal or less than 0.05.

Results and discussions

In cumulative group of organized children Chlamydia antigens were found in 14.2% subjects (Table 1). Taking into account age distribution of urban population in Russian Federation, standardized index was lower and approached 12.9%. CP as monoinfection was diagnosed in 8.5%, CT - in 2.4% children. Simultaneous presence of both types was marked in 3.3% cases. In the structure of identified types the share of chlamydophilic infection was twice more than CT (in 67.6% cases against 32.4%). It was diagnosed in 11.8% children, but CT was revealed in 5.7% subjects.

Chlamydia contamination in mucosa of upper respiratory tract was influenced by the age of a child (Table 1). The highest percentage of infected children was marked in pre-school ages (in 24.8%). Chlamydia was less frequent in early school ages (in 14.7%). Much more rarely they were identified in senior schoolchildren (in 7.7%). In pre-school and early school ages and also in cumulative children group CP was verified significantly more often ($p < 0.01$): in 20.7% and 12.8 % against 8.3% and 6.1% correspondingly as compared to identified CT. In ages 12 to 17 we didn’t marked the differences in between the frequency of CP (in 5.1%) and CT (in 3.4%) ($p = 0.4$). The presence of gender peculiarities in Chlamydia contamination in children of different ages was not proved.

Chlamydia in children leads to high probability of ENT-pathology. It has been proven by the fact of higher percentage of diseases in children with identified Chlamydia as compared to

the children without confirmed infection ($p < 0.001$): in 72.5% (95% CI 67.8 – 83.0) against 38.6% (95% CI 35.1 – 42.1). We marked higher level of both acute (in 37.5% against 12.3%, $p < 0.001$) and chronic pathology (35.0% against 26.3%, $p = 0.05$). Higher frequency of acute diseases in different phases of inflammatory process activity in Chlamydia infection was based upon the prevailing of rhinopharyngitis (in 31.0% against 9.6%, $p < 0.001$) and rhinitis (in 6.7% against 2.6%, $p = 0.04$). Differences in the prevalence of chronic ENT pathology were caused by pharynx diseases (in 30.0% against 18.9%, $p = 0.01$), such as adenoiditis (in 11.7% against 4.8%, $p = 0.01$) and hypertrophy of palatine tonsils (in 8.3% against 2.2%, $p = 0.004$).

Higher level of common ENT-pathology in Chlamydia infected children took place in all age categories due to the higher level of acute diseases: rhinopharyngitis in pre-school and early school ages (16.7 – 36.1% against 2.2 – 11.9%) and rhinitis in senior schoolchildren (in 11.1% against 1.4%). Besides, pharynx chronic pathology was diagnosed more often in the last ones (in 27.3% against 11.1%).

Chlamydia contamination of upper respiratory tract mucosa in adults of employable age was found in 11.0% of the subjects (Chart 2). Standardized index was 10.4%. CP as monoinfection was diagnosed in 5.6% subjects and CT – in 3.1%. Chlamydia mixed infection took place in 2.3% subjects. In the structure of identified Chlamydia types, the share of chlamydropilic infection was almost 1.5 times higher than CT share and amounted to 59.4%.

We didn't reveal that Chlamydia contamination frequency depend on age. In groups from 18 to 29 years of age and from 30 to 60 years Chlamydia was identified in 12.7% and 9.5% ($p = 0.3$) correspondingly. But Chlamydia mixed infection was more often marked in ages before 30 years (Table 2). We revealed gender specifics, which was shown by more frequent Chlamydia contamination in females (15.1% in females against 7.9% in males, $p = 0.01$) due to CT monoinfection (4.9% against 1,8%).

In both adults and children with verified Chlamydia infection ENT pathology was diagnosed more often as compared to non-infected subjects ($p = 0.01$): in 52.8% (95% CI 39.5 – 66.0) against 33.0% (95% CI 28.7 – 37.5). As opposed to children, adults showed differences in totals for the revealed ENT-pathology based only upon prevailing of chronic diseases (in 41.5% against 27.2%, $p = 0.04$) on the account of higher level of pharynx diseases (in 30.2% against 13.3%, $p = 0.004$), chronic tonsillitis in particular (in 11.3% against 2.8%, $p = 0.02$).

Age peculiarities in the frequency of ENT-pathology were manifested not only by higher number of ENT-diseases as a whole in subjects with identified Chlamydia in ages from 18 to 29 years and from 30 to 60 as compared to non-infected subjects (in 52.0 – 53.6% against 32.6 – 33.3%). They were manifested as well by higher levels of chronic pathology ($p = 0.04$) in a group

older than 30 years of ages on the account of pharynx diseases (in 40.0% against 15.6%, $p=0.01$), tonsillitis in particular (in 12.0% against 2.1%, $p=0.05$).

In 27.5% children and in 47.2% adults with identified Chlamydia antigens there was no observed pathology of ENT-organs. The absence of clinical symptoms under the marked presence of Chlamydia can be caused by the development of persisting infection, hardly diagnosed by laboratory means or by the possibility of transitor carrying infection or false-positive character of laboratory test.

Complex laboratory tests had allowed to reveal high indices in the frequency of Chlamydia infection in children with acute maxillary sinusitis, exacerbation of chronic adenoiditis and hypertrophy of pharyngeal tonsil: correspondingly in 48.5% (95% CI 36.6-60.5), in 53.9% (95% CI 45.3-62.4) and in 50.3% (95% CI 42.9-57.7) cases. In adults Chlamydia were registered less frequent than in children in acute purulent maxillary sinusitis, exacerbation of chronic purulent maxillary sinusitis and different forms of chronic rhinitis: correspondingly in 39.1% (95% CI 25.7-53.5), in 33.0% (95% CI 23.6-43.1) and in 40.7% (95% CI 32.0-49.6).

In both patients and organized population the structure of verified Chlamydia showed the dominance of CP. Its share prevailed 1.5 times in children and 2 times in adults in accordance with nosology as compared to CT share. Age differences were marked in children with hypertrophy of pharyngeal tonsil so as Chlamydia were significantly more frequent in pre-schoolchildren (in 60.5% against 39.0% in schoolchildren of 7 to 17 years of age, $p=0.01$) and in adults older than 30 years of age with exacerbation of chronic maxillary sinusitis (in 57.1% against 17.0% in subjects of 18 to 29 years of age, $p<0.001$).

Conclusion

So, the results of the research showed high prevalence of respiratory Chlamydiosis in mucosa of upper respiratory tract in organized population (in 14.2% children and in 11.0% adults) in patients with different pathology of nose, paranasal sinus and pharynx (in 48.5%-53.9% in children and in 33.0%-40.7% in adults).

In children the frequency of Chlamydia verification was less in elder ages (from 24.8% in pre-schoolchildren to 7.7% in senior schoolchildren). As compared to senior schoolchildren with the same frequency of CP and CT, preschoolchildren and junior schoolchildren were more infected with Chlamydia. In adults disregard the age CP prevailed. CP and CT simultaneously were revealed more often in subjects younger than 30 years of age. Chlamydia in females were revealed considerably more often on the account of CT monoinfection.

Chlamydia contamination in upper respiratory tract in organized population determines the tendency to more frequent ENT-pathology as compared to non-infected subjects on the account

of prevailing acute and chronic diseases in children, chronic diseases in adults. Differences in frequency of chronic pathology are caused by pharynx pathology on the account of adenoiditis and hypertrophy of palatine tonsils in children and on the account on tonsillitis in adults.

SUMMARY

1. We marked high frequency of Chlamydia contamination in mucosa of upper respiratory tract in organized children and adult groups (correspondingly in 14.2% and 11.0%, standardized indices 12.9% and 10.4%), in patients with different pathology of nose, paranasal sinuses and pharynx (in 48.5%-53.9% in children and in 33.0%-40.7% in adults).

2. The higher was the age of children, the smaller was the frequency of Chlamydia verification (from 24.8% in pre-school children to 7.7% in secondary school children).

3. Unlike schoolchildren of final classes (in whom CP and CT were revealed with the same frequency) pre-schoolchildren and junior schoolchildren were infected with Chlamydia more frequently (in 20.7% and in 12.8% against 8.3% and in 6.1% correspondingly).

4. In adults irrespective of the age CP infection prevailed. Simultaneous CP and CT infection was revealed more often in subjects younger than 30 years of age (in 4.1% against 0.8% in subjects of senior ages).

5. Considerably more often Chlamydia was found in female subjects (in 15.1% against 7.9% male) on the account of mono infection with *C.trachomatis* (in 4.9% against 1.8%).

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Table 1

The prevalence of different types of Chlamydia infections in organized children

Age group, its volume	Mono infection with Chlamydophila pneumoniae		Mono infection with Chlamydia trachomatis		Chlamydia mixed infection		Total for children with verified Chlamydia	
	n	%, 95% CI	n	%, 95% CI	n	%, 95% CI	n	%, 95% CI
Group 1 3-6 years (n=121)	20	16.5 10.5-23.5 $p_{1-2}=0.01$ $p_{1-3}<0.001$	5	4.1 1.3-8.4 $p_{1-2}=0.2$ $p_{1-3}=0.4$	5	4.1 1.3-8.4 $p_{1-2}=0.9$ $p_{1-3}=0.04$	30	24.8 17.5-32.8 $p_{1-2}=0.01$ $p_{1-3}<0.001$
Group 2 7-11 years (n=491)	42	8.6 6.2-11.2 $p_{2-3}=0.03$	9	1,8 0.8-3.2 $p_{2-3}=0.5$	21	4.3 2.7-6.2 $p_{2-3}=0.003$	72	14,7 11.7-17.9 $p_{2-3}<0.001$
Group 3 12-17 years (n=234)	10	4.3 2.1-7.2	6	2.6 0.9-5.0	2	0.9 0.1-2.4	18	7.7 4.6-11.4
Total (n=846)	72	8.5 6.7-10.5	20	2.4 1.4-3.5	28	3.3 2.2-4.6	120	14.2 11.9-16.6

Note: p is statistical meaning for the differences between children in different age groups as per Student's criterion and exact Fisher's criterion.

Table 2

The prevalence of Chlamydia infection in
adults of employable age

Age group, its volume	Mono infection with Chlamydophila pneumoniae		Mono infection with Chlamydia trachomatis		Chlamydia mixed infection		Total for children with verified Chlamydia	
	n	%, 95% CI	n	%, 95% CI	n	%, 95% CI	n	%, 95% CI
Group 1: 18 - 29 years (n=221)	11	5.0 2.5-8.2 $p_{1-2}=0.6$	8	3.6 1.6-6.5 $p_{1-2}=0.6$	9	4.1 1.9-7.1 $p_{1-2}=0.01$	28	12.7 8.6-17.4 $p_{1-2}=0.3$
Group 2: 30 - 60 years (n=262)	16	6.1 3.5-9.3	7	2.7 1.1-5	2	0.8 0.1-2.2	25	9.5 6.3-13.4
Total (n=483)	27	5.6 3.7-7.8	15	3.1 1.7-4.8	11	2.3 1.1-3.8	53	11.0 8.3-14.0

Note: p is statistical meaning for the differences between children in different age groups as per Student's criterion and exact Fisher's criterion.

Authors' signatures.

- KAPUSTINA Tatiana Anatolievna – full professor of Medicine, leading scientist in Ecological Pathology Department of SSRI NP SD RAMS
- MARKINA Anjela Nikolaevna, senior scientist of Ecological Pathology Department of SSRI NP SD RAMS.
- BELOVA Elena Valentinovna, MD , senior scientist of Ecological Pathology Department of SSRI NP SD RAMS.

Author to contact with:

KAPUSTINA Tatiana Anatolievna, Russian, 660017, Krasnoyarsk, ul.Dubrovinskogo, d.106, kv.193, office phone number is +7 391 228 06 58, phone - 8-908-021-9902

E-mail: TAK34@yandex.ru (home) and rsimpn@scn.ru (office).

A.L. Timofeev

The social status of the population of rural settlement in territory of city district Yakutsk (on an example of v. Magan)

Представлена оценка социального статуса населения сельского поселения на территории городского округа «Якутск».

Ключевые слова: социально-демографические показатели, жилищно-бытовые условия, совокупный семейный доход.

An assessment of the social status of the population of rural settlement in the city district "Yakutsk" territory is presented.

Keywords: socio-demographic characteristics, living conditions, the total family income.

Author's Data: Timofeev Artem Leonidovich - the general practitioner, the head of Magansky branch MU «YGB № 2»

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G.I. Oskol'sky, **L.M. Nepomnyashchikh**, A.V. Yurkevich,

E.L. Lushnikova, N.V. Yurkevich

**STUDY OF STRUCTURAL-PROLIFERATIVE CHANGES
IN GINGIVAL EPITHELIUM ASSOCIATED WITH CHANGES IN THE
PARODONTIUM STATE**

Far Eastern State Medical University, Khabarovsk

Institute of regional pathology and pathomorphology Siberian division

Of Russian academy of medical sciences, Novosibirsk

The summary: literature review of structural and proliferative changes in the epithelium of the gum associated with changes in parodontium status is presented.

Keywords: epithelium of the gum, proliferative processes.

Clinical appearance of oral mucosa associated with comorbid internal conditions reflects its morphological restructuring and includes papillary hyperplasia, gingival hyperemia and stomatorrhagia, which corresponds to chronic gingivitis [15, 21, 22, 41, 44].

It's obviously related to vascular restructuring which may lead to revascularization with the growth of new arterioles and capillaries. Their walls however are not morphologically ready to deliver biologically active substances to the full extent [3, 6, 14, 24, 27, 29, 40].

There are data regarding a positive correlation between H. Pylori colonization of oral mucosa and gastrointestinal mucosa in patients with gastrointestinal disorders. The highest level of H. Pylori oral and gastrointestinal mucosal colonization is found in denture patients. A state of the parodontium, an oral hygiene state and a level of H. Pylori oral and gastrointestinal mucosal colonization are also correlated [4, 22].

It's been found that physiological regeneration in oral epithelium is characterized by three interrelated processes: cell migration, proliferation and differentiation. It must be noted that the label incorporated into DNA as early as 48 hours after DNA labeling. The labeled cells start passing to the surface in twenty-four hour period. The speed of epithelization is 0,27 mm/h and it overtakes the speed of granulation tissue formation (0,04 mm/h) [10, 11, 28].

Regenerating epithelium is characterized by the presence of glycogen granules in the cells' cytoplasm and increased amount of RNA and oxidation/reduction enzymes. During the processes of differentiation and multilayer epithelium formation these features are being lost. Despite number of studies there are not enough data regarding epithelial regeneration in dental patients with comorbid conditions [16, 17, 18, 19, 24, 31, 36].

There is a high correlation between epithelization and granulation tissue growth. Not only epithelium can stimulate the growth of granulation tissue but it also produces collagenase which participate in the tissue restructuring. Delay in epithelization results in early sclerosis of granulation tissue which, in turn, slows down epithelization of affected areas. Though epithelium may grow on any surface, a firm cellular layer forms only on granulation tissue of certain maturity. Regeneration of both epithelium and granulation tissue is regulated to a large extent by fibroblasts and hormonal factors, such as epidermal growth factors of different origin and growth inhibitors. Epithelial hyperplasia (inflammatory inserting growth) results from mechanisms similar to those seen in regenerative hypertrophy of internal organs [2, 6, 9, 26, 30, 32, 33, 43, 38].

Changes in proliferation activity of gingival epithelium and the lamina propria of the gingival are typical morphological presentations of their reaction to any internal abnormalities [13, 16, 18, 19, 23, 34].

Some authors believe that ^3H -thymidine radioautography provides the most reliable and accurate data on DNA synthesis [8, 16, 24].

In gingival epithelium ^3H -labeled cells are found in the stratum basale, much less often in the stratum spinosum. A cell uses ^3H -labeled thymidine during DNA synthesis. It accumulates in the nuclei which either undergo the S-phase or enter it during incubation [6, 16, 20, 35].

The absence of glycogen in the stratum basale and deep layers of the stratum spinosum of gingival epithelium reflects prevalence of Krebs cycles enzymes activity. That proves the fact mytoses, which occur mostly in this part of epithelial layer, require energy released by oxidation [37].

Mitotic activity of tissue is strongly influenced by exo- and endogenous factors, physical activity in particular. Some of these factors which influence circadian rhythm of cell division are functional cell activity and general functional activity of a body. Changes in metabolism are links in a complex chain of processes which drive a circadian rhyme in mitotic activity. In a natural 24-hour cycle in human body activity a negative correlation is seen between functional activity and cell division [1, 7, 16].

During intensive short-term physical load mitotic activity decreases dramatically due to increased adrenalin release. Long-term physical load results in increased mitotic activity. “Antagonism” between function and mitosis reflects the relationship between the processes [1, 16, 18, 19].

Denture use can be likened to long-term physical activity, which helps to explain the increase in epithelial mitotic activity under a denture base. Short-term denture use is associated with decreased mitotic activity while long-term denture use induces its increase [17, 25].

E.I. Gavrilov (1979) holds a different opinion. In his view, after 5 years of denture use a decrease in mitotic activity results from glycogen appearing in the cells of the basal layer and lower glucose uptake [5].

During the study of gastrointestinal epithelium by means of radioautography spontaneous circadian mitotic activity was found with a roughly 24 ± 4 hours cycle. There are two peaks in the cycle, though the second peak seen during evening and night hours is less evident [1, 19, 35, 42].

A study of cell proliferation in oral mucosa in female denture patients showed prevalence of average frequency of labeling, intensity of incorporation and mitotic index values. These data indicate higher intensity of regeneration in women than in men, due probably to sexual dimorphism and bad habits [17, 23, 24].

According to J.S.Rowat and C.A.Squier (1986), a mitotic index also correlates with the thickness of an epithelial layer, indicating higher speed of proliferation. Lining mucosa renews faster than masticatory mucosa [39].

Mitotic activity in gingival epithelium increases when epithelial keratinization slows down which happens in gingivitis and parodontitis [30, 39].

There is a correlation between severity of gingivitis, extent of morphological changes and intensity of cell division. This fact proves that gingival epithelium is still capable of an adequate adaptive response in the presence of increasing inflammatory and dystrophic changes. The growth of a mitotic index combined with a relatively stable frequency of labeling numbers indicate some disruption of cell differentiation and more rapid extrusion of cells associated with gingival inflammation. In the same time the increase in a mitotic index may represent lengthening the duration of mitosis, not a rise in the number of cells undergoing it [18, 19].

Some clinical forms of lichen planus is reported to be associated with increased number of parodontium inflammatory diseases [12].

Thus the analysis of the literature on morphology of parodontium in patients with comorbid internal conditions showed that changes in the state of the oral cavity occur due to metabolic, haemodynamic, immunological and neuroregulatory processes associated with a disease. The literary data indicate that gastrointestinal tract disorders coexist with changes in oral mucosa. This interrelation is produced through anatomical, physiological and humoral communications between different parts of the gastrointestinal tract.

Studies of the upper gastrointestinal tract in patients with comorbid internal conditions have shown that a type changes in oral mucosa depends on the form and duration of a main disease.

In the same time there are some changes of the oral cavity mucosa typical for different gastrointestinal conditions. Besides, patients with comorbid internal diseases may present with various inflammatory and destructive changes in the oral cavity mucosa. It should be noted, however, that there are not enough data on how a patient's age, their general health condition and the state of the oral cavity affect a morphological structure of denture base mucosa. The existing data are contradictory which may reflect different approaches to defining age groups and lack of a comprehensive morphological characterization of the oral cavity mucosa.

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INFORMATION ABOUT THE AUTHORS

1. Georgiy Iosifovich Oskol'skiy

Head of Prosthetic Dentistry Department FESMU, professor, PhD (medicine), member of RANS.

Tel.: (4212) 32-58-00.

2. Lev Moiseevich Nepomyashchikh

Honoured worker of science of RF, corresponding member of the RAMS, doctor of medical sciences, professor of SU SRI of regional pathology and pathomorphology SB of RAMS.

630117, Novosibirsk, Academician Timakov st. 2.

Tel.: 33-48-45

3. Aleksandr Vladimirovich Yurkevich

Professor of Prosthetic Dentistry Department, doctor of medical sciences, corresponding member of RANS.

Tel.: (4212) 625-888, e-mail: dokdent@mail.ru.

4. Elena Leonidovna Lushnikova

Doctor of biological sciences, professor of SU SRI of regional pathology and pathomorphology SB of RAMS.

630117, Novosibirsk, Academician Timakov st. 2.

Tel.: 33-48-45

5. Natalia Vladimirovna Yurkevich

Assistant Professor of Preventive Dentistry Department FESMU.

Tel.: 32-58-00

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N.V. Zakharova, V.A. Dorovskikh, I.V. Borozda

**ROLE OF OXIDATIVE STRESS IN THE OCCURRENCE OF THE LEGG-CALVE-
PERTHES DISEASE.****BASIC CONCEPTS OF PATHOGENESIS, DIAGNOSIS AND TREATMENT**

(literature review)

*The Amur State Medical Academy**675000 Gorky street, 95, Blagoveshchensk, Amur Region***Summary**

In article the authors consider a modern level of knowledge of etiology, pathogenesis of the disease Legg-Calve-Perthes (DLCP), a new approach to diagnosis and treatment DLCP in view of knowledge about of oxidative stress, antioxidant system, lipid peroxidation.

Key words: disease Legg-Calve-Perthes, oxidative stress, antioxidant system, lipid peroxidation.

The Disease Legg-Calve-Perthes (DLCP) is a complex pathological process in the hip joint, which is based on ischemic disorders, leading to the aseptic necrosis of the femoral head, and the outcome is a disruption of the normal anatomical structure and function the joint.[5]

Questions of etiology and pathogenesis of the disease to date remain open.[19]

In the development of the disease Legg-Calve-Perthes (DLCP) plays a crucial role oxidative stress and the decrease in the protective functions of the antioxidant system (AOS).[23] The doctrine of innervation receptacles closely connected with the problem of the trophic action of the nervous system, particularly sympathetic.[11]. Under the influence of multiple factors (stress, cold, trauma) and the presence of background changes (neyrodisplaziya, vazodisplaziya, osteodisplaziya) [18, 20] there is an activation of sympathetic nervous system and the release of norepinephrine in the blood stream [20].

Underdevelopment of microvascular network and its terminal departments leads to the fact that it could not compensate for the critical state in hemodynamics joint. [15] Appearance in

the blood of excessive amounts of noradrenaline indirectly, through the release of calcium and fatty acids, can stimulate the intensity of free oxidation in the mitochondria and, thereby, lead to an increase in oxygen consumption and heat production. [22]

Thus identified with the help of additional methods of research violation of the hips, not stacked in frameworks gipovaskulyarization purely vasodistodisplastics genesis, associated with disorders relation between neurodynamic regulation of the hip joint tissues, including microcirculation vascular bed. [15] The greatest role of these disorders is at the early stages of the disease, affecting the transfer of the convertible vascular disorders in the stage of decompensation of microcirculation in bone and cartilage development and necrotic parts. [11]

Articular tissue is very sensitive to the effects of internal and external factors, under the influence of which may cause spasm or thrombosis subchondral area of the bone or the synovial membrane with the subsequent disturbance of microcirculation and the development of oxygen insufficiency in the cartilage [15]. In the tissues of the elements of the joint is the accumulation of oxidized products of metabolism. Malnutrition cartilage leads to its destruction. [7,22]

Thus, DLCP take place neurological, cardiovascular and metabolic disorders (neurohumoral character). It is not only variation vessels bringing blood the hip joint, the blood flow and circulation, but also rolling and rheological properties of blood. [1,19] Biogenic changes in the vessels of the hip joint, the ends of venous blockade with subsequent venous hypertension. [19] Some researchers confirm that change in the rheological properties of blood is one of the leading mechanisms of DLCP, others believe this is a consequence of the neuroendocrine changes that occur as a result of the haemostaziological and rheological factors. [1] There is also evidence, that in the mechanism of development of DLCP an important role is played by the processes of lipid peroxidation (LPO) and antioxidant system (AOS). [14]

Therefore, the emerging pathology is also the result of oxidative stress and reduce the protective functions of the AOS. [2]

It is known that the acceleration of the processes of lipid peroxidation (POL) is one of the reasons for destabilization of the membranes and the development of pathological changes [9]. Danger to the body of LPO products represent only in the case of disturbances in the functioning of the AOS or the depletion of its reserve capacities. It is known, that the system antiperoxidant protection consists of enzymatic and nonenzymatic links. The enzymatic system includes several enzymes, superoxide dismutase, catalase, glutathionperoxidase, glutathionreductase, glutathione-s-transferase and ceruloplasmin. Many of them catalyze reactions, as a result of which toxic free radicals and peroxide neutralized [14].

Acceleration of the processes of peroxidation is one of the reasons for destabilization of the membranes and the development of pathology [9]. At the first stage of the process are formed diene conjugates fatty acids (DC FA). From the formed DC FA with further impact on them hydroxyl radicals are formed lipids of peroxidation. The products of the peroxidation cause conformational changes in the phospholipids and complex of phospholipids, which leads to the disruption of the organelles of cells, organs and the whole organism. In the field of action of peroxide radicals fatty acids are broken into fragments, at the ends of which are located aldehyde groups, possessing high reaction ability. If the reaction occurred with the two parties, formed malondialdehyde (MDA). Reacting to SH and CH₃-groups of proteins, MDA inhibits the activity of enzymes: cytochrome oxidase, hydroxylase and etc. Thus, peroxidation has an essential role in the regulation of the metabolism of membrane lipids, changing the physico-chemical properties and permeability of biological membranes in physiological conditions. [9].

Group of substances possessing ability to inhibit the formation of peroxides classified in the group of antioxidants.[2, 5] Some of them is a derivative heterocyclic compounds pyrimidine derivatives. It was found that pyrimidine derivatives in particular, the drug of choice, in our case, mexidol, increase the resistance of the organism to a variety of adverse effects, effect on the neurological, cardiovascular and metabolic link of the DLCP. [5, 14]

In our opinion, in all existing conservative treatment methods DLCP there is no method of therapy that can influence on the pathogenic processes in the tissues of the joints, to prevent the transition to the irreversible stage necrotic parts of the femoral head and enhance the effectiveness of treatment by preventing the expansion volume neurodystrophic tissue and vascular reactions. [11,19] We believe that antioxidant therapy may be used in a specific pathogenetic method in combined treatment of DLCP. [14]

Existing methods of diagnostics allow to confirm our findings and to make treatment of reasonable and purposeful. [2, 3, 6, 21]

For the diagnosis DLCP, in our work, we have used: x-rays of the hip joints, computed tomography, ultrasound of the hip joints, ultrasound of the hip joints with color doppler mapping. [9, 11, 16]

For diagnosis of the efficiency of the antioxidant treatment we used: determination of hydroperoxides lipids, malonic dialdehyde, vitamin E, diene conjugates, ceruloplasmin in the blood plasma[5, 14], as well as the results of ultrasound with color doppler mapping. For diagnostic efficiency of complex treatment with the use of antioxidants used evaluation of the clinical picture of the disease and x-ray examination in dynamics. [16, 18]

In our work was carried out x-rays of the hip joints ultrasound of the hip joints with dopplerography, computer tomography. [12, 11]

Traditional x-ray examination in the early stages of aseptic necrosis of the femoral head of pathological changes does not reveal. X-ray examination is not always possible to answer the question about the exact location and size of the pathological process, the state of cartilage and paraarticular tissues. [11]

For the assessment of treatment outcomes, taking into account radiological and clinical data, the use of a unified classification DLCP, developed by The St. Petersburg children's orthopedic institute them Turner in 1987. [15]

To the perspective of modern methods of x-ray diagnostics include computed tomography (CT), which allows early to recognize the symptoms of aseptic necrosis of the femoral head [9]. CT allows to reveal the early stage of avascular necrosis of the femoral head. The tomograms noted the decrease in the density of bone structures in the affected limbs compared with the healthy. CT provides layer by layer, polypositions to explore the structure of the head and neck of the femur, to produce qualitative and quantitative assessment of the head of the femur and the acetabulum with the definition of public relations of the articular surfaces, the size of cystic cavities and their correlation with areas of sclerosis bones, as of the subchondral bone tissue [9].

Ultrasound with doppler ultrasonography to assess regional blood supply with different pathology of hip joints in children, is an important method for evaluating the efficiency and adequacy of treatment, load management and functional therapy. The previously angiography is not widely spread, as it is invasive method and is intended, basically, for a single study. Modern ultrasonic devices, with the possibility of color doppler flow mapping, provide the highest resolution diagnostic images of ligaments, tendons, cartilage tissue. The possible evaluation of the vascular reactions in the area of the detected changes, as well as monitoring of treatment [21]. The method is highly informative, non-invasive, fast in performance in the real-time mode, with the possibility of multiple implementation and evaluation of the dynamics of the process is relatively cheaper. Today ultrasound, undoubtedly, is the method of choice in the diagnosis of changes in various organs, including changes in the hip joints [9].

Evaluation of effectiveness of complex treatment of patients with DLCP with the use of antioxidants was held on the 3-point system M.M. Kaparov (2005) with the clinical and x-ray picture.[7]

The lack of clarity in the etiopathogenesis osteochondropathy femoral head leads to erroneous treatment tactics. A very important one view on etiology and pathogenesis DLCP, and hence the common views on the tactics of the treatment. [9]

In the last decade in the domestic and foreign literature emphasizes the need for the complex nature of the treatment DLCP.[9] This implies that underlying conservative methods of influence on the pathological process, traditionally including orthopaedic and physiotherapeutic activities, if necessary, can be combined with operational methods. [16]

Medicamental therapy is aimed at improving the supply of the hip joint tissues of oxygen, improvement of capillary blood flow, reducing blood viscosity [1]. With this purpose, some authors recommend trental, which has vasodilating, anticoagulant and weak antioxidant action [2], or curantylum [2]. Used drugs aimed at restoring the metabolism of cartilage. [10,15]

All the methods of surgical treatment directed on improvement of trophism of the femoral head. These include tunnelization neck of the femur a bunch of pins or pins with the introduction of the neck of the femur of proteolytic enzymes (chymopsin, trypsin). There is also alloplasty in the neck thigh muscle flap on the supply vessel. All the more widely in the treatment of to date used high technology, which are treated by minimal invasive and effective enough. In some clinics to revascularization of the femoral head has developed and introduced into practice a method revascularizing laser osteoperforation neck of the femur with the use of high-intensity laser radiation. Other authors offer to restore and increase the blood flow in line with the dominant arteries use of endovascular double barreled shotguns balloon catheter, entered percutaneously in the femoral artery below the bifurcation with deep artery of the thigh. Laser osteoperforation the femoral neck.[10, 15]. When inefficiency of conservative therapy to accelerate the process of reparation carry out implantation in the region osteochondropathy bioactive polymer compositions on the basis of H-vinylpyrrolidone and methyl methacrylate with medicinal fillers under arthroscopic control. [10, 15]

Identification of trends to subluxation hips and progression of structural changes in the head of the femur (broken line of Shenton, decentering, necrosis more than half of the femoral head, кистевидная restructuring in the neck, increase of age- cervico diaphyseal angle and angle antetorsii) with dynamic x-ray examination serves as the indication for the operative treatment. Surgical treatment of the disease Perthes is aimed to achieve the decompression of the joint, to improve blood supply to the femoral head and the concentration of the femoral head in the hollow. The existing or expected decentration in hip joint (in the case of total and subtotal destruction) to preserve or restore the shape and size of femoral head is required her centering in

the acetabular depression [12] in connection with than all of conservative and operative methods of treatment are divided into providing and not providing accumulate head. [2, 8]

Currently in Scientific Research Institute, Children's Orthopedic of the. G.I. Turner corrective osteotomy is supplemented in some clinical cases rotary transposition of the acetabulum in Salter. The operation is applied when expressed increasing the width of the epiphysis, increase of angle antetorsii, a subluxation of the hip. [13] In the Russian Scientific Center «Restorative Traumatology of the academician G.A. Ilizarov» method in the treatment of illness Perthes is used transosseous compressive-distraction osteosynthesis. The diagnosis is an indication for surgical treatment. Surgical task is to change the load profile at the hip joint by a subtrochanteric osteotomy, perceiving this operation as osteotomia medicata. The intersection of the bones in subtrochanteric region is a powerful stimulating factor in the restoration of the power of the femoral head in the conditions of altered anatomical situation. [4, 8]

After removing the locking devices are massage, therapeutic gymnastics, acupuncture and physical therapy in outpatient conditions or in a specialized sanatorium. The question of load on a limb (partial or complete) is determined individually for each patient depending on the degree of recovery of structure and form of the head of the femur, which define by x-rays.[14]

Proceeding from all aforesaid treatment on the initial (to X-ray) stage DLCP should be first of all pathogenic, and include symptomatic therapy. Both types of therapy have equivalent value, as without addressing the main factor and the reasons supporting the disease is not can be quick and complete recovery of the proximal epiphysis of the head of the femur, and even after the operation the disease will be a long and stubborn character.[3]

The positive side of the conservative methods of treatment is their relative simplicity and non-invasive, possibility of treatment in out-patient conditions, as well as the ability to influence on pathogenetic part of the disease.[15]

The greatest distribution was received by physical methods of treatment. In recent years, the experience of manual therapy techniques aimed at correction of the pelvic girdle and spine, manipulation techniques are carried out only in the discharge of the spine, only in lying position with the use of soft traction, do not apply shock techniques.[7, 16]

Of physical methods of treatment of the most widespread: classical massage, therapeutic gymnastics, physiotherapy, electrical stimulation of muscles, mud, hydrotherapy and kinesitherapy. [7, 12, 15]

Medicamental therapy at БИКП should be aimed at improving the supply of fabrics hip joint oxygen, improvement of capillary blood flow, reducing blood viscosity. [2]

On the summary data, conservative treatment brings good and satisfactory results in 24-62% of cases, surgical - in 47-83% of cases. [2, 3]

However, in all methods of treatment, in our opinion, is not enough method, which is capable to influence the pathogenetic processes and prevent changes to an irreversible stage necrotic parts, including by preventing the expansion of нейродистрофических tissue and vascular reactions of increasing the efficiency of spent treatment. In our opinion this method is an antioxidant therapy in a complex treatment of DLCP. [5,14]

The most effective in the quality of the links raising resistance of an organism to a variety of negative impacts are the compounds of pyrimidine series. [2] They are able to accelerate the regeneration of the skin, mucous membranes, muscles, bones, tendons, various divisions of the nervous system. Earlier in his work E.V.Ped in 2000 used emoxipine. Intraosseous summary of emoxipine to the site of damage decreases in the activity of lipid peroxidation, which improves the clinical and radiological indices of the pathological process, reduces the severity of the pineal gland and contributes to a more rapid recovery of bone structure and form of the femoral head.[2]

The drug of choice in our study is mexidol, which corrects violations in the regulatory and microcirculate systems, that is expressed in the fact, that causes the elimination of spas bearing microvessels, and also has a modulating effect on the activity of membrane binding enzymes, ion channels and receptor complexes, enhancing the ability for the binding of ligands, increasing the activity of neurotransmitters and activation of synaptic processes. Thus, provides multifaceted biological action: anticoagulant, angioprotective, prolonged antioxidant. That is, has an impact on almost all the parts of the pathological system, which forms the disease. [5]

Thus, in view of differences of creators in the etiopathogenesis and the low efficiency of treatment determine a large variety of conservative and operative methods of influence on the pathological process. It is difficult to disagree with the common point of view that the approach to the treatment of children with DLCP should be differentiated [19], and the treatment to be comprehensive and include conservative methods of influence on all the links of the pathogenesis of the disease [10, 12], and also include various methods of surgical correction [2, 3, 4, 8], depending on the stage of the process with antioxidant protection in the process of treatment. [5]

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Zakharova Natalia Vitalievna, post-graduate student of the department of traumatology and orthopedics ASMA contact telephone 89098189659, g. Blagoveshchensk, Kolkhozniy lane 1 kv 58, e-mail: zakharova58@inbox.ru

Vladimir Anatolievich Dorovskikh, honored science worker of Russia, doctor of medicine, professor, head of department of pharmacology ASMA

Ivan Victorovich Borozda, doctor of medical science, head of the chair of traumatology and orthopedics of ASMA

Modern Models of Moral Medicine

M. P. Dutkin

Summary: This article briefly compares three models of moral medicine, from which the "contract" model is recognized as meeting the requirements of most medical ethics.

Keywords: ethical medicine, models of moral medicine, paternalism, partnership, psychiatry.

Modern medical ethics is considering the vast number of new and difficult ethical issues: euthanasia, cloning, compulsory treatment of alcoholism and drug addiction, an artificial coma, artificial insemination, "pill happy", a transplant of vital organs, brain death.

The dilemma of "paternalist" ("Trustees") and "nonpaternalist" ("partner" or "peer") approaches (models) is the core to modern medical ethics.

"Paternalist" model of physician-patient relationship is based on several assumptions: a) in terms of healing human health and life are by far the priority values, and b) doctor's ethical stance is reflected in the principle of "Providing patient care, has not caused him any harm", and c) the principle deprives the patient's ability to make their own decisions and shifts it to the doctor. Thus, the physician shall have a way of "Father" (a Latin word Pater), or "parent", and the patient is properly vested with "Baby." The word "Father" has traditionally served as a metaphor for God and the priest, and, accordingly, the physician shall have the status of unquestionable authority.

"Paternalist" model has played an important role in the history of medicine. With the approval of paternalist physician-patient relationship due to bridge the gap of morality and life, the establishment of ethics in medicine. But at the same time, the moral authority of the physician has such an impact on the patient that suppresses the freedom and dignity.

Harbinger of the crisis in the Russian medical paternalism was a crisis of involuntary treatment in psychiatry in the late 80s, early 90s. Twentieth century. Rod "problematic situation" in the provision of psychiatric care was involuntary treatment as a consequence of "paternalist" model of medical ethics. Up until the late 88-ies of XX century, compulsory hospitalization of the mentally ill was considered an overwhelming immutable social norm.

The Law of the Russian Federation "On psychiatric care and guarantees of citizens' rights in its provision" of July 2, 1992 the principle of voluntary treatment is essential.

Another consequence of the "paternalist" model is the concealment of information from the patient about his health (in particular, information about the incurable disease) because of the principle of "holy lie for the good of the patient." In the model of "partnership" ("peer") type of physician and patient need to see each other as equal partners or peers, working towards common goals - to eliminate the disease and protect the health of the patient. It is a model of peer type trust plays a crucial role. When two people or two groups of people actually defend the common goals, their confidence is justified, and the collegial model type is adequate. Here there is equality and dignity, and respect in that there was no inherent "paternalist" model.

Collegiate model adopts the principle of "informed consent", which refers to the voluntary adoption of patient treatment or therapeutic procedure after a doctor to provide adequate information. The doctor is charged with the duty to inform the patient about: a) the nature and purpose of the proposed treatment of him, and b) the associated significant risk, and c) possible alternatives to this type of treatment. From an ethical point of view of an alternative concept proposed treatment is central to the idea of "informed consent". The doctor gives advice on the most appropriate from a medical point of view of form, but the patient makes the final decision on the basis of their moral values. Thus, the doctor refers the patient as an end rather than as a means to achieve other goals, let it be even health.

However, according to Robert Veatch, director of Kennedy on ethics at Georgetown University (USA), "collegial" model proved inadequate to understand the nature of relations, "the doctor - patient" because the relationship "doctor - patient" asymmetrical and unequal: the physician - a crucial side, it represents the power of professional knowledge and skills, and the patient, while reserving the right choices and decisions, build it on the basis of medical advice [1]. He noted that the ethical, class, economic, and value differences among people make the principle of common interests that are necessary for the model of "partnership" ("peer") type, an empty dream.

R. Veatch offers a model of "contract" type - a model based on a contract or agreement. The term of the contract should not invest a legal sense. There two individuals or two groups of people act on the basis of mutual obligations and expect reciprocal benefits.

According to R. Veatch, only the model of "contract" type can be a genuine separation of moral authority and responsibility. It allows you to avoid false and uncontrolled equality in the model of "partnership" ("peer") type. In a relationship based on the contract, the physician is aware that in cases of meaningful choice for the patient should remain free to manage their own lives and destiny. If the doctor will not be able to live in harmony with their conscience, entering into such relationship, the contract is terminated or, or not lies. The patient also has legitimate reason to believe that many different solutions, which the doctor should be taken daily in patient care, will be in accordance with the value orientations of the patient.

In the model of "contract" type of decisions are made so that there is still confidence in the fact that both patient and physician morale cleanly. At the individual level control for patient decision-making is provided without requiring the participation of the patient in making medical decisions for each. Control of decision making in situations where there are moral problems, by ethics committees, which exist in most U.S. hospitals. Decisions thus made amateur community, but the daily medical decisions can be made by medical professionals based on trust.

Search for new axiological (value) basis of moral medicine, such as participation, solidarity, compassion, empathy, interviewing, compliance continues. Thus, there is all the new paradigm of medical thinking, based on respect for the autonomy of the individual. Today, individual self-determination is the highest value, and care should not be an exception.

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Information about the author:

Ph.D., Associate Professor of Neurology and Psychiatry, Medical University of the North-Eastern Federal University, physician psychotherapist M. P. Dutkin.

677000, Belinskij Str. 58, Yakutsk, RF. Tel. 89441742330. e-mail: maksDutkin@mail.ru

THE ORGANIZATION OF WORK OF THE CITY CHILDREN'S EPILEPTOLOGIST

G.M. Baisheva, A.V. Vjuchin

NEFU named after M.K.Ammosov, Yakutsk

Children's city hospital, Yakutsk

Introduction. The epilepsy is the chronic disease of a brain characterized by repeated not provoked attacks of infringement of impellent, sensitive, vegetative, cognitive or mental functions, arising owing to excessive neural categories (ILAE, 1989). By data the WHO an epilepsy is widespread neurologic disease to which in the world it is subject more than 50 million persons. In the developed countries its prevalence fluctuates from 1, 5 to 18 persons on 1000 population and in some developing countries exceed 30 on 1000 population. The social importance of this disease is defined by high percent of disability patients [5]. According to the world statistics annually registered disease of an epilepsy averages 70 on 100 000 population.

Most often epilepsy is met at children. Epilepsy and paroxysmal frustrations at children are among the important medical, social, psychological and economic problems. Attacks at children are characterized not only high frequency, but also by expressiveness degree. During this period when there is an intensive development of a brain, attacks can lead to secondary changes from outside mentalities of the child. At in due time begun and qualified treatment the probability of treatment from attacks at children's age makes 80-90 %. At the same time there are forms of the attacks which probability of treatment is much less, approximately from 10 % to 40 %, and there

are they seldom enough. But now there was a possibility to help and these people. World experience shows that treatment by high doses of anticonvulsive medicine under the control of pharmacological monitoring allows to cure of attacks more quantity of earlier heavy in treatment patients.

One of prominent aspects of rehabilitation of the given category of patients is the organization of complex medical aid, considering that the basic treatment sick of an epilepsy receive in out-patient conditions. The important links of the help sick of epilepsy, entering into the international standards [3] are realized. As rehabilitation of epilepsy patients we understand system of the medicamentous and not medicinal actions directed on partial or a complete recovery of biological and social status of the patient. Distinguish medical, sociolabor and family rehabilitations.

In many countries of the world epileptology became independent medical discipline. The speciality of the doctor-epileptologist is accordingly allocated also. Epileptology is the versatile speciality uniting in numerous aspects of neurology, psychiatry, neurosurgery, neurophysiology, neuroradiology, clinical pharmacology, neuropsychology and social studies. In Russia the speciality of the doctor-epileptologist is not allocated yet in the nomenclature of medical workers [4]. In modern epileptology one of the priority purposes is improvement of quality of a life and rehabilitation of epilepsy patient.

The important questions on the organization of treatment of epilepsy patient are much more expedient for solving at level of administrative region since in this state structure all necessary conditions for fast and rational realization of the most successful workings out of carrying out of the specialized help of the population [2] are put.

Research objective: to carry out the analysis of work of the children's epileptologist for 2009 – 2010.

Materials and research methods. The analysis of work of children's epileptologist for 2009-2010 at «Children's city hospital» is carried out. We used clinical-epidemiological, neurophysiological, statistical research methods.

Epilepsy was diagnosed according to the International classification of epilepsy, epileptic syndromes and similar conditions (New Delhi, 1989). Electroencephalography (EEG) was spent on the device «the Nejrion-spectrum 3» ("Nejrosoft").

Statistical processing of the received results was spent with use of computer program Microsoft Excel.

Results and discussion. According to the epidemiology researches in children in Yakutia prevalence of disease has made 4, 9-5, 2 on 1000 children's population. Physical inability is established at 33, 8 % of children with epilepsy. In Yakutsk according to neurologists 264 children with the diagnosis epilepsy are on regular medical check-up. According to the official statistics prevalence of epilepsy among the children's population of Yakutsk makes 6,2‰. The cabinet of the epileptologist is organized in 2009 for improvement of quality of rendering of medical aid to children with epilepsy.

The cabinet of the city epileptologist is organized by the Order of management of public health services of Yakutsk on the basis of Children's city hospital in 2009. In Russia there are no standard documents concerning the organization and reception planning of epileptologist. However, many questions can be solved at level of municipal departments, the ministries. The legal basis of service has been prepared, 2 doctors are trained: the neurologist - epileptologist and neurophysiologist. Under the municipal program «Health protection of women and children» are got: the system of video-EEG monitoring first in republic « Neuron-spectrum 3» (Russia) and anticonvulsive medicines for treatment of children not having physical inability and not receiving anticonvulsive medicines on additional medicinal maintenance. Besides, by experience of the organization of such cabinets in other regions, loading on the doctor - epileptologist (not less than 30 minutes on the patient) was established. All these actions in aggregate allow to correct adequately a dose of a preparation.

The primary goals of a reception of epileptologist are: differential diagnostics of epileptic attacks and other paroxysmal conditions at various diseases of nervous system and a somatic pathology; complex inspection for the purpose of specification of the form of attacks and their etiology; selection of anticonvulsive therapies and dynamic supervision of the patients receiving anticonvulsive therapy; medical-social rehabilitation of patients with an epilepsy and others paroxysmal conditions; examination carrying out.

Medical indications to a direction of patients on consultation and treatment are: for the first time revealed epilepsy and others for the first time arisen paroxysmal conditions; an epilepsy, resistant to treatment; epileptic syndrome of an unstated etiology; not classified and not specified paroxysmal conditions with infringements of consciousness, behaviour, vegetative crises, dizziness attacks, a migraine and others paroxysmal headaches, dream frustration; dynamic supervision of the patients receiving antiepileptic treatment, for an estimation of its efficiency and safety. Reception is carried out in directions of neurologists and local doctors within the obligatory health insurance on preliminary record. In an office the personified account of

patients with epilepsy is conducted. In case of need the patient goes on inspection and treatment in the conditions of neurologic branches of Republican hospital №1 and Republican hospital №2.

For 2009-2010 2314 consultations, initially 40 %, repeated consultations of 60 % are done. The data of these children are given in the created register of epilepsy patient which allows to carry out versatile monitoring on the given problem in Yakutsk. 40 % of children, suffering from epilepsy, addressed in an office, had no verified diagnosis in medical institutions or were observed with the diagnosis «a convulsive syndrome», «epileptic syndrome» that did not correspond to requirements of ICD and classifications of ILAE. Including, the part of children (5 %) was treated with the preparations which have been not recommended at the certain clinical form of epilepsy. At half (50 %) for the first time addressed with the diagnosis epilepsy correction of ant-epilepsy therapy was done, as received doses and schemes of preparations were insufficiently effective or at all inefficient (a small dose counting on weight of a body, an inefficient combination of preparations, the submaximum doses in the absence of significant clinical effect).

In 14 % of cases from patients being under constant observation for today epilepsy for the first time is diagnosed. In 20 % of cases from them children suffered the present disease in a current of several years, however, the diagnosis epilepsy has not been exposed owing to low availability of EEG research, absence of prolonged EEG monitoring, including video-EEG monitoring (which for today is the gold standard in epilepsy diagnostics). Analyzing gender-age structure of children registered with epilepsy is possible to conclude that morbidity is a little higher at preschool age 2 - 6 years (30,5 %), in early school 7- 9 years (24,4 %), teenage age of 10-17 years (45,1 %, including children of 10-14 years – 13,3 %; to sexual sign boys slightly prevail (55 %) that corresponds to the WHO statistics.

Due to the analysis of addressing to doctor it was revealed that for 2 years of work of an office there was an increase in dispensary groups on 42,1 % (2009 – 131, 2010 – 226). And also a share for the first time revealed cases during the current year 10,2 % and 18,2 % from all dispensary groups for all period of work of service. To 100 % of cases to patients with epilepsy routine EEG, in 57,1 % of cases (129 children) video-EEG monitoring (2009 – 120) were carried out. In 100 % of cases validity in application of the given method of research is noted.

The reception structure under epilepsy forms represents the following (it agree ISD 10): generalized idiopathic epilepsy - 28,8 %; localized (focal) idiopathic epilepsy and epileptic syndromes with convulsive attacks with the focal beginning - 26,1 %; special epileptic syndromes - 16,4 %; localized (focal) a symptomatic epilepsy and epileptic syndromes with simple partial attacks - 11,1 %; localized (focal) a symptomatic epilepsy and epileptic syndromes

with complex partial convulsive attacks - 7,6 %; other kinds of generalized epilepsies - 5,3 %; other specified forms of an epilepsy - 2,35 %, an epilepsy not specified - 2,35 %.

The purposes of treatment sick of epilepsy include: 1) disposal of attacks; 2) minimization of undesirable by-effects; 3) the prevention or elimination of mental frustration; 4) social restoration; 5) assistance to a healthy way of life; 6) a life without medicines and without attacks.

Within the limits of the municipal program patients gratuitously receive expensive anticonvulsive medicine that was positively reflected in quality of therapy and observance of a principle of a continuity of reception of the appointed preparation.

Efficiency of treatment: recover in 2010 has made 2,3 % (2009-2,3 %), in 31,5 % of cases is reached full remission. In 30 % cases positive clinical dynamics, but with incomplete remission is reached. At 33,7 % of children remission currently is not reached (2009 – 32,8 %), considerable positive dynamics are noted. In 11 cases (4,3 %) negative dynamics is marked: in 3 cases it was a the malignant form of a current of disease, in 2 cases low level of compliance, at 2 - self-cancellation by parents of a preparation on reaching significant clinical effect, in 4 cases - failure of remission or deterioration of a current of disease occurred under the recommendation of not profile experts to full cancellation of anticonvulsive therapy.

Because of absence of original anticonvulsive medicines and its replacement by generic drugs there is a problem of medicinal supplying of children having a category "disability child". Replacement of original medicines by generic drugs can lead to failure of medicamentous remission.

The conclusion. Thus, the organization of complex medical aid has allowed generating complete strategy of advising epilepsy patients at municipal level. The continuity of anti-epileptic treatment of city patients with epilepsy is adjusted; the succession and interaction with neurologists of the city polyclinics, observing patients of a given contingent have improved. 100% of children with epilepsy, being under constant observation of epileptologist receive anticonvulsive therapy with individual correction of a dose of preparations. Tactical questions of end of medicamentous treatment of patients in a condition of epilepsy remission are fulfilled. The received results of treatment of epilepsy patients: increase in quantity of patients with remission, improvement of their life quality, improvement of continuity of conducting patients allow to confirm necessity and timeliness of the organization of city epileptologist consulting room.

But at the same time, for perfection of work of the children's city epileptologist it is necessary to solve following problems: acquisition of the additional diagnostic equipment for out-patient daily record EEG («Holter EEG»), the additional module of polysomnography on

available system of video EEG-monitoring; concentration definition of anticonvulsive medicines in blood for medicinal monitoring that will allow to improve selection of antiepileptic therapy; supplying of patients by original anticonvulsive drugs under the program.

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Data of authors:

Baisheva Galina Maksimovna, the senior lecturer, MD, the senior lecturer of chair of neurology and psychiatry of MI NEFU

The contact information:

The post address, 677000 Yakutsk 58 Belinsky street

E-mail baishevagm@mail.ru

Vjuchin Andrey Viktorovich, the doctor neurologist of «Children's city hospital», Yakutsk

E-mail Rasskaschik@yandex.ru