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K.S. Gavrilyeva, M.V. Handi, A.V. Golomareva, A.A. Zakharova

Features of Individual and Typological Indicators of Physical Development of Young Athletes of the Republic Sakha (Yakutia)

ABSTRACT. The comparative analysis of indices of individually typological constitutional peculiarities of athletes and male teenagers not involved in sport was carried out. The results revealed that athletic trainings do not affect anthropometric indices, Caucasian boys are more advanced than their Mongoloid peers in physical development ($p < 0,05$). Higher prevalence rate of Kettle and Rohrer's indices at athletes as well as normal BMI and best indicators of heart rate, blood pressure and vital capacity were noted among athletes as compared with the another group.

Keywords: physical development, young athletes.

INTRODUCTION. A morphological and functional characteristic of the organism is now considered as one of the indicators of individual health [2].

It is now important to study features of physical development in assessing the state of health of the child population, as it reflects the formation of morphological and functional properties of an organism [4].

The status of physical development allows to characterize the level of health, to predict the further development of children and teenagers to determine their willingness to work and sports life, to conduct rational planning of training loads of physical culture and sports in different groups of physical education [4].

There is a view that somatic indicators may evolve under the influence of sports, and sports specialization exerts modifying effects on skeletal figures, as well as girths of the body [1].

The aim of this study is to compare features of individual and typological characteristics of the organism of young athletes and adolescents not involved in sports.

MATERIALS AND METHODS

The study was conducted on the basis of the health and recreation center of the Institute of Physical Culture and Sports of North-Eastern Federal University named after MK Ammosov. The observation was held in 2 groups of male adolescents aged 16. The main group consisted of 93 young athletes, professional athletes of Sport School №5. Sports experience was ranged from 2 to 4 years. Control group consisted of 49 apparently healthy teenagers, without bad habits, not involved in sports, but attending physical education lessons in secondary school.



Examination included anthropometric research methods, the definition of somatotype by Eysenck, the calculation of the index of skeletons; study of muscle, bone and adipose tissue, blood pressure (BP), heart rate (HR), hand muscle strength, vital capacity (VC) according to conventional techniques.

The statistical processing has been performed using the software package IBM SPSS Statistics 21.

RESULTS AND DISCUSSIONS

The comparative analysis of the physical development of young people not involved in sports shows no significant differences between the physical developments (Table 1). Athletes' chest excursion is less than 12.3%, with higher rates of chest circumference.

The analysis comparing the two groups of adolescents of different race showed that Caucasian boys outperform their peers of the Mongoloid race in the physical development. Teens-Mongoloids lag behind in terms of body weight by 13.7% ($p=0,003$), growth of 4.8% ($p=0,05$) in the study group; in the control group - by 15.2% ($p=0,003$) and 3.2% ($p=0,05$) respectively. Based on the research results, we can say that sports do not affect human somatotype as growth – size is genetically determined by 90-95%.

The investigation of constitution in terms of muscle, fat and bone components showed that in the main group the component of the muscle is on average 6.5% ($p=0,000$) higher and fat is 28.1% ($p=0,000$) lower than in the the control group (Table 2). Kettle's and Rohrer's indexes of overall weight and growth are indicators of changes under the influence of training. Kettle's and Rohrer's indexes are higher in athletes than in young men not involved in sports (Table 2).

The analysis of calculated rates of different ethnicity in the control group showed that the index of Kettle and Rohrer in Caucasian boys is higher than that of the Mongoloids. In the main group the study of type of constitution showed increased muscle and decreased fat components as compared with the control group of the Mongoloid race. It was noted that the relative weight of the fat component of the Caucasian athletes is 32.3% ($p=0,000$) higher than in the control group of peers of the same race.

The analysis of functional parameters revealed that athletes have the best indicators of heart rate and vital capacity, and optimum normal blood pressure for their age (Table 3).

The analysis of somatotype by Eysenck revealed dolihomorphic (56.9%) and mesomorphic (40.8%) body types among athletes with normal body mass index (59.1%). The results of the studies of teenagers not involved in sports showed that most of them have dolihomorphic body type (71.4%) with low body weight (59.1%).



CONCLUSION

The comparative analysis of the physical development of healthy young men aged 16 not involved in sports and young athletes suggests that athletic training does not affect anthropometric indices: Caucasian boys are more advanced in the physical development than their peers of the Mongoloid race ($p < 0.05$). The indicators of Kettle and Rohrer's indices are higher in the group of athletes than in the comparison group. In addition, the best indicators of heart rate, blood pressure and vital capacity have been marked in teenagers involved in sports.

The study also found that the body mass index is significantly different in comparison groups ($p < 0.01$). Thus, normal BMI is more common in athletes (59.1%). For teenagers who are not involved in sports - BMI is below normal (59.1%).

Among the athletes there are boys with dolichomorphic and mesomorphic body types. Teens who do not exercise have dolichomorphic body type.

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Table 1.

Comparative characteristics of anthropometric indicators of athletes and young people not involved in sports, different ethnicity

Anthropometric indices	p	Core Group, M + m			The control group, M + m		
		Total (n=93)	Mongoloid race (n=59)	Caucasian race (n=34)	Total (n=49)	Mongoloid race (n=31)	Caucasian race, (n=18)
1. The body mass	$P_{1=0,003}$	61,19±9,38	58,29±7,09*	67,57±12,11	59,85±10,33	56,79±6,79	66,95±13,51
2. Height	$P_{1=0,05}$	171,06±7,54	168,46±6,86*	177,01±6,26	172,08±6,81	170,45±6,7*	176,14±6,26
3. Body length	$P_{1=0,016}$	90,91±4,31	90,05±4,05*	93,07±3,96	90,39±4,03	89,92±4,22	91,41±3,49
4. Arm's length	$P_{1=0,006}$	75,02±3,63	74,15±3,57*	77,21±3,29	76,26±3,27	75,76±3,04	77,55±3,75
5. Leg's length	$P_{1=0,000}$ $P_{2=0,015}$	87,93±5,69	86,16±4,92*	92,55±5,6	90,26±4,97	89,16±4,05**	93,36±4,65
6. The body mass index		20,83±2,12	20,51±1,86	21,45±2,83	20,15±2,78	19,54±2,04	21,52±3,79
7. Girth of chest	$P_{1=0,002}$ $P_{2=0,021}$	87,46±5,71	86,39±4,97*	89,86±7,24	84,82±6,17	82,63±4,41*	89,75±6,62
8. Inhalation	$P_{1=0,002}$ $P_{2=0,019}$	91,76±5,75	90,66±5,21*	94,07±6,86	88,99±5,89	86,85±4,48*	93,82±6,03
9. exhalation	$P_{1=0,004}$ $P_{2=0,000}$	85,29±5,52	84,32±4,51*	87,45±7,31	81,61±5,96	79,5±4,24*	86,25±6,85
10. Excursion		6,47±1,95	6,34±2,07	6,62±1,94	7,38±2,11	7,34±2,19	7,57±2,14

Wherein M - means value, m - standard deviation

Note. * - P1 differences between the races paired in the same group; ** - P2 differences between groups of the same race, *** - differences with the control group

Table 2

Estimated young athletes and young men are not involved in sports, different ethnicity

Estimate	P	Core Group , M±m			Control group , M±m		
		Total (n=93)	Mongolo id race (n=59)	Caucasian race (n=34)	The total (n=49)	Mongolo id race (n=31)	Caucasian race (n=18)
The area of the body	P₁=0,01	1,72±0,16	1,67±0,13*	1,85±0,17	1,72±0,15	1,67±0,12*	1,83±0,17
Kettle's index		356,68±43,40	345,44±34,23	380,49±58,4	346,98±52,49	332,84±35,1	379,36±70,95
Life index		63,00±10,55	63,77±10,78	61,65±10,29	62,72±10,02	64,2±9,74	58,4±9,53
Chest index	P₂=0,001	51,15±2,89	51,32±2,74**	50,75±3,4	49,32±3,37	48,53±2,89	50,99±3,76
Defatted mass index	P₂=0,000	1,09±0,11	1,1±0,11**	1,08±0,10	1,00±0,11	0,99±0,10	1,01±0,12
Rel. Bone mass component		18,72±1,76	19,05±1,79	19,31±1,82	19,30±2,10	19,68±2,02	18,46±2,24
Rel. mass of the fat component	P₁=0,05 P₂=0,000 P₃=0,000	10,49±3,17** *	10,11±3,2**	10,91±3,16**	14,59±4,96	13,77±3,45*	16,12±7,24
Rel. muscle mass component	P₂=0,000 P₃=0,000	50,52±2,90** *	50,67±2,39**	50,82±3,28	47,26±3,97	46,7±3,49	48,37±4,37
Rohrer's index	P₂=0,011	1,22±0,12	1,22±0,12**	1,21±0,14	1,17±0,16	1,15±0,13	1,22±0,21

Wherein M - means value, m - standard deviation

Note. * - P1 differences between the races paired in the same group; ** - P2 differences between groups of the same race; *** - P3 differences with the control group

Table 3

Comparative characteristics of the functional parameters of athletes and young men are not involved in sports

Functional indices	P	Basic group, M±m			Control group, M±m		
		The total (n=93)	Mongoloid race (n=59)	Caucasian race (n=34)	Total (n=49)	Mongoloid race (n=31)	Caucasian race (n=18)
Heart Rate	P ₂ =0,027	71,03±9,16	70,56±7,85 **	71,65±11,82	76,12±9,73	76,16±7,73	74,8±13,58
ADC		114,25±11,29	113,49±11,81	117,96±9,48	119,57±16,57	119,97±15,6	117,87±18,11
ADD		72,26±9,30	71,31±8,96	74,22±9,54	75,33±11,83	75,68±10,69	73,8±13,82
AD_puls		41,99±9,17	42,19±9,07	43,74±9,12	44,24±10,15	44,29±11,17	44,07±8,75
VC		3810,75±613,30	3 684,75±556,95	4095,65±667,75*	3693,88±532,45	3 616,13±515,17	3 833,33±601,98
The right hand strength	P ₁ =0,025	39,69±8,19	38,32±7,9	41,00±8,6	38,02±9,42	35,87±10,33*	42,8±5,72
The left hand strength	P ₁ =0,009	36,61±8,73	35,03±8,77	37,91±7,93	36,10±8,23	33,35±8,47*	41,47±5,19
Body force		118,04±21,33	117,02±19,87	114,52±22,26	116,10±27,20	119,32±30,99	112±19,57

In the main group of Caucasian athletes indicators of VC and wrist strength is higher than the indicators of the Mongoloid athletes.



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A.S. Asekritova, E.S. Kylbanova, E.A. Emelyanova

Gastroesophageal reflux disease in a combination with metabolic syndrome among inhabitants of Yakutia

ABSTRACT

The analysis of comorbidity of reflux disease and metabolic syndrome at Yakut and Russian population showed that gastroesophageal reflux disease in patients with the metabolic syndrome, regardless of nationality differs by polymorphic clinical course, a higher rate of dyspeptic and extraesophageal symptoms.

Key words: comorbidity, gastroesophageal reflux disease, metabolic syndrome, Yakutia.

INTRODUCTION

The study of comorbidity is one of the most topical issues of modern medicine, as the analysis of character of the combined pathology is essential for timely diagnosis and selection of further treatment strategy. The comorbidity of digestive diseases and metabolic syndrome (MS) has been studied little, and their studies are ambiguous.

According to the Central Research Institute of Gastroenterology (Moscow) a nosological picture of digestive diseases in MS patients is presented as a metabolic triad of disorders of the esophagus, including gastroesophageal reflux disease (72%), diseases of the liver and biliary tract (64%) and colon (68%) [6].

Clinical-morphological and functional features of gastroesophageal reflux disease (GERD) were studied in different age and ethnic groups of the population of Yakutia [1,2,3,5]. However, currently no studies concerning the comorbidity of reflux disease and metabolic syndrome among Yakuts are noted. In this context, **the aim** of this article is to analyze the comorbidity of reflux disease and metabolic syndrome.

MATERIALS AND METHODS

The study involved 140 patients based on the Emergency department of the Republican hospital №2 - Emergency center and gastroenterology department of Yakutsk City Clinical Hospital of Yakutsk from 2010 to 2013. The work is a part of the research project "Metabolic syndrome and chronic non-communicable diseases among inhabitants of Yakutia" (Registration number YSU: 11-01M.2009) approved by the local Committee for Bioethics at the Yakut



Scientific Center of complex medical problems SB RAMS (Protocol №24 dated June 29, 2010.). All patients gave informed consent to participate in the study.

A study group comprised 50 patients with GERD Yakut nationality and MS, including 19 men (38%) and 31 women (62%), with an average age $47,5 \pm 1,48$ years. A control group included 50 Yakuts I GERD without metabolic syndrome - 18 males (36%) and 32 women (64%) in the control group II - 40 Russian with GERD and MS - 14 men (35%) and 26 women (65%). The average age of patients 2 control groups was $46,3 \pm 1,73$ years and $46,9 \pm 1,72$ years, respectively.

The diagnosis was made on the basis of complaints, medical history, physical examination data and results of endoscopic and radiological studies of the upper gastrointestinal tract. Preliminary verification of the diagnosis was conducted in accordance with recommendations of the Mayo Clinic and the Montreal Consensus (2006) with unavoidable presence of patient's troublesome heartburn and / or regurgitation once a week or more during the last 6 months. Esophagitis severity was assessed using a modified classification of Savary-Miller (1996).

Metabolic syndrome was diagnosed on the basis of the recommendations of the All-Russian scientific society of cardiology from 2009.

Statistical processing and analysis of data were performed using the package IBM SPSS Statistics 19. For selection of a statistical criterion in verifying laws of normal- theory polygenic character a Kolmogorov – Smirnov's test was applied adjusted by Lilliefors and a Shapiro-Wilk test. Non-parametric tests were used in accordance with the verification in comparison of independent groups. Pairwise comparisons were performed using a Mann-Whitney test. The comparison of the groups by oligogenic character was performed using a contingency table with calculation of a criterion χ^2 - Pearson. For statistical significance threshold criteria were noted as $p < 0,05$.

RESULTS AND DISCUSSION. The analysis of clinical reflux disease revealed that the leading symptom is heartburn, revealed at the majority of patients, regardless of their ethnicity and the presence or absence of the metabolic syndrome (Table. 1). The patients of the main group suffered from heartburn / regurgitation mainly in the daytime (46%), while the patients of the control group I had this symptom irrespectively of time of a day (52%), and patients of the group II having it significantly more often at night (52.5%, $p < 0.05$). Clear connection of the provocation of heartburn / regurgitation with the reception and content of food was observed at 90% of patients of the main group.



Daily bouts of heartburn were observed in the Russians (52.5%, $p < 0.05$). A smaller number of the Yakuts had heartburn, as 64% of the patients with GERD and with metabolic syndrome complained on heartburn 1 or more times a week including 62% of the patients without MS.

Dyspeptic syndrome was often ascertained in association with reflux disease and metabolic syndrome, regardless of the ethnicity of patients. Thus, a sense of heaviness in the epigastric region was observed in 70% of the Yakuts and 75% Russian, bloating - 68% of the Yakuts and 75% Russian, a sense of early fullness - 14% and 35% of Yakuts and Russian, abdominal pain - 44% of the Yakuts and 62.5% Russian.

Other common symptoms of GERD are chest pain arising in the supine position, especially at night and air burping mainly observed in the case of association with metabolic syndrome (16.3% in Yakuts and 17.5% in Russian; 66% in Yakuts and 77, 5% in Russian, respectively).

Statistically significant differences were not found in accordance with morbidity rate of dysphagia and odynophagia in two groups.

Clinical manifestations of reflux disease were characterized by the presence of extra-oesophageal symptoms in patients with metabolic syndrome, regardless of their nationality, but several symptoms more frequently observed in Russian. Thus, nocturnal cough and hoarseness were noted in 24% of the Yakuts, and 35% and 47.5% Russian, respectively.

These findings are consistent with studies of other authors, noted the impact of MS on the variability of the clinical picture of GERD associated with a high incidence of dyspeptic symptoms and extra-oesophageal symptoms [4,9,10].

During the endoscopic investigation non-erosive (endoscopy negative) esophagitis was ascertained mainly in Yakuts (72% of the main group and 74% of the control group I), while erosive esophagitis - in Russian (70%) (Table 2). The first-degree esophagitis was found in 37.5% of Russian, which was significantly more than the Yakuts with GERD in both groups. The 2nd-degree reflux esophagitis was diagnosed at 16% of the main group and in 20% of the control group II. Circular multiple erosions are twice as likely have been found in Russian, but not statistically significant. Deep ulcerations of the esophagus (ulcers) with bleeding were identified at a slightly higher frequency in Yakuts with MS. Symptoms of cardiac insufficiency were ascertained in almost all patients, but with a slightly higher frequency in patients without MS. Hiatal hernia was observed at every fifth Yakut with MS and with no MS, and every fourth Russian with MS. Duodenal reflux was diagnosed in most surveyed, but with a



slightly higher frequency in patients of the Russian nationality (82.5%). Erosion in the mucous antrum and duodenal bulb was diagnosed significantly more frequently in Yakuts without MS and Russian with MS (Table. 2). Our results are consistent with the published data of other authors [2,7,8].

Polypositional contrast X-ray examination of the upper gastrointestinal tract, carried out in 39 patients of the main group and in 36 patients of the control group I, 28 patients of the control group II, allowed to establish signs of esophageal motor dysfunction and the presence of morphofunctional changes.

CONCLUSION

Thus, our results showed that gastroesophageal reflux disease in the population of Yakutia with metabolic syndrome, regardless of ethnicity, differs with the polymorphic clinical course, higher frequency of dyspeptic disorders and extraesophageal symptoms.

Table 1. Clinical characteristics of GERD

Symptoms	Groups of patients, %			p ⁰⁻¹	p ⁰⁻²
	Main group	Control group I	Control group II		
Heartburn	96	98	95	NS	NS
Regurgitation	14	12	27,5	NS	NS
Connection of heartburn / regurgitation with:					
- a change in body position	90	86	90	NS	NS
- eating	90	48	67,5	<0,001	<0,05
- food content	90	50	70	<0,001	<0,05
Connection with the time of a day:					
- during the daytime	46	20	25	<0,001	<0,05
- mostly at night	30	28	52,5	NS	<0,05
- regardless of the time of a day	24	52	22,5	<0,001	NS
Belching	66	14	77,5	<0,001	NS
Odynophagia	10	16	20	NS	NS
Dysphagia	10	2	20	NS	NS
Severity of epigastric	70	24	75	<0,001	NS
Abdominal distention	68	32	62,5	<0,001	NS
Abdominal pain	44	16	47,5	<0,001	NS
Chest pain	16,3	4	17,5	<0,05	NS
Feeling of early saturation	14	2	15	<0,05	NS
Night cough	24	8	35	<0,05	NS
Hoarseness	24	12	47,5	NS	<0,05
Snore	86	14	75	<0,001	NS
The frequency of heartburn / regurgitation					
1 or more times a month	6	4	2,5	NS	NS
1 or more times a week	64	62	40	NS	<0,05
1 or more times per day	26	32	52,5	NS	<0,05
No heartburn / regurgitation	4	2	5	NS	NS

Note: In the Table 1-2 p⁰⁻¹ - statistical significance between the main group and the control group I, p⁰⁻² - between the main group and the control group II; NS – no significance.

Table 2. Endoscopy

Endoscopic picture	Groups of patients, %			P ⁰⁻¹	P ⁰⁻²
	main group	controlgroup I	controlgroup II		
Non-erosive esophagitis	72	74	30	NS	<0,001
Erosive esophagitis	28	26	70	NS	<0,001
Degree of reflux oesophagitis					
I	2	14	37,5	<0,05	<0,001
II	16	6	20	NS	NS
III	4	6	10	NS	NS
IV	6	0	2,5	NS	NS
Concomitant pathology					
Cardioinsufficiency	84	94	87,5	NS	NS
Hiatal hernia	18	22	25	NS	NS
Duodenal reflux	76	62	82,5	NS	NS
Gastroduodenal mucosal erosion	16	30	55	<0,05	<0,001

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Interrelation of a Leptin Level with Factors of Cardiovascular Risk at Stable and Unstable Stenocardia

ABSTRACT

The research detected a leptin level at patients with ischemic heart disease subject to the course of stenocardia (stable or instable). We established that destabilization of the IBS course is characterized by elevation of leptin level and increase of a number of its correlation relationship with factors of cardiovascular risk in comparison with patients with stable stenocardia.

Keywords: coronary heart disease, leptin, cytokines

INTRODUCTION

Leptin is a protein hormone structurally similar to the first class of cytokine, secreted by fatty cells and controlled by genome, causing obesity [13]. A leptin level of serum correlates with the general content of fat in an organism [8], reflects a total power reserve of fatty tissue and can change in energy imbalance [3, 10]. So, leptin raises with increasing fatty tissue mass, and its production in hypodermic and fatty cellulose is higher, than in visceral fatty depots [7]. Leptin count in blood directly depends on body weight [2]. It is known that the hyperleptinemia is associated with obesity [9]. Leptin promotes development of atherosclerosis and atherothrombosis at apolipoprotein - E-scarce mice [12]. It is known that leptin is an independent predictor of myocardial infarction at patients with arterial hypertension [6]. Leptin activates immune cells and stimulates the cellular immune reaction, influences production of pro-inflammatory cytokine by direct impact on a vascular wall [1, 11]. Change of leptin levels, free fatty acids, adipokin are one of the possible reasons of development of insulin resistance in patients with myocardial infarction [5]. Research of features of interrelation of leptin level with factors of cardiovascular risk depending on a form of the course of coronary heart disease (CHD) is of great significance.

MATERIALS AND METHODS

In this research 61 men with the diagnosis CHD aged from 42 till 70 years (middle age $54,9 \pm 7,17$ years) were included. Of them 32 men had stable stenocardia (middle age of $54,7 \pm 1,1$ years), and 29 men with a sharp coronary syndrome without rising ST segment on the electrocardiogram (firstly diagnosed stenocardia, unstable stenocardia) (middle age of $55,3 \pm 1,5$

years). Anthropometrical parameters were measured at the patients: growth, body weight, circle of a waist, hips, thorax. The body mass index (BMI) was calculated as follows: $BMI = \text{body mass (kg)} / \text{growth (m)}^2$.

Laboratory researches included determination of ASAT (aspartataminotransferase), ALAT (alaninaminotransferase), alkaline phosphatase, GGT (gamma glutamil transferase), LDG (laktat degidrogenase), a kreatinkinase, glucose, the general protein, albumine, urea, uric acid, a kreatinkinaza the general, the general cholesterol, triglycerides, HDL in blood serum. All biochemical indicators were determined on the automatic biochemical Labio analyzer with application of the commercial reactants "Biocon" (Germany). The LDL and VLDL and a rate of atherogenicity were determined by standard methods. Concentrations of C-reactive protein (CRP) and cytokines in blood serum were defined by method of the immunofermental analysis: IL-4, IL-6, IL-8, IL-10, IFN- γ (interferon- gamma) and TNF- α (tumor necrosis factor- alpha) (Vektor-Best, Novosibirsk), as well as leptin level (DRG diagnostic", USA).

Immunophenotyping of lymphocytes was conducted by a method of flow cytometry (FACSCalibur, Becton Dickinson) with use of monoclonal antibodies with a threefold tag: CD3FITC + CD4RPE + SD45RPE-Cy5; CD3FITC + CD19-RPE + SD45RPE-Cy5; CD3FITC + CD8RPE + SD45RPE-Cy5; CD16FITC + CD19RPE + CD3RPE-Cy5; with one tag of CD25-RPE; Sd11b-RPE; CD71-FITC; (Dako); CD54-RPE, CD95-RPE (Becton Dickinson), CD62L-FITC (Sorbent, St. Petersburg).

All patients gave the informed consent for being involved in the research. The protocol of research was approved by the local ethical committee in compliance of the Helsinki declaration (2000). The statistical analysis of the obtained data was carried out by means of the package SSPS version 17.0. Equality of selective averages was checked by Student's criterion (at normal distribution) and to nonparametric U-criterion of Mann-Whitney for independent selections (at abnormal distribution). Data of the comparative analysis are presented in the table as follows: median (25th and 75th percentile). For definition of correlation ratio between the studied quantitative data an analysis with calculation of Spirmen's correlation ratio was carried out. Distinctions at $p \leq 0,05$ were considered statistically significant.

RESULTS AND DISCUSSION. Results of the comparative analysis showed that both groups of patients were age comparable, however significant distinctions in growth of a body were noted ($r=0,03$), waist circles ($r=0,005$), hips ($r=0,000$) and a thorax ($r=0,027$) were noted, i.e. with anthropometrical distinctions: at persons with unstable stenocardia these indicators were much higher ($173,03 \pm 1,35$ cm; $104,51 \pm 1,85$ cm; $106,46 \pm 1,34$ cm; $108,42 \pm 1,62$ cm), than at

patients with stable stenocardia ($169,25 \pm 1,03$ cm; $93,47 \pm 2,94$ cm; $93,26 \pm 2,88$ cm; $101,15 \pm 2,72$ cm), respectively. However on BMI both groups had no significant distinctions: at unstable stenocardia $30,13 \pm 0,84$ kg/m², and at persons with stable stenocardia - $29,97 \pm 0,84$ kg/m². The research of leptin level showed that of all examined patients (n=61) only 22 men (36%) had leptin level within norm, the rest 39 patients (64%) had the higher level. The leptin level shouldn't to exceed 13,8 ng/ml at men aged 20 years and more.

Fig. 1. Distribution of patients with CHD on the leptin level

The comparative analysis of distribution on the leptin level depending on the CHD form established that at unstable stenocardia a number of patients with the leptin level exceeding the norm was significantly higher, than at stable stenocardia ($\chi^2 = 5,66$; $p=0,032$) (fig. 1).

The analysis of laboratory indicators of blood showed that at unstable stenocardia at patients the quantity of leukocytes ($p=0,007$), concentration of VLDL atherogenous fraction ($r=0,027$) and aterogen ratio significantly increases ($p=0,031$), and concentration of anti-atherogenous HDL ($p=0,000$) was significantly reduced, than at stable stenocardia (табл 1). Along with it, at patients with unstable stenocardia increase of level of pro-inflammatory cytokine of IL-8 ($p=0,008$), TNF- α ($p=0,009$) and concentration of CRP ($p=0,013$), and also decrease in a level of anti-inflammatory cytokine of IL-4 is noted ($p=0,047$), these parameters testifying to activation of inflammatory processes at destabilization of a course of coronary heart disease. Average value of the leptin concentration in blood serum of patients with unstable stenocardia ($32,45 \pm 4,71$ ng/ml) was significantly higher ($p=0,049$) than at stable stenocardia ($20,58 \pm 3,66$ ng/ml).

The correlation analysis of the leptin level with major factors of cardiovascular in the general selection of patients (n=61) established direct correlations of the leptin level with BMI ($r=0,510$; $p=0,000$), with circles of hips ($r=0,509$; $p=0,000$), thorax ($r=0,496$; $p=0,001$) and waists ($r=0,461$; $p=0,001$). Indirect distinction in correlation ratio is confirmed by data of the authors [4] testifying that the leptin level in serum increases at increase in mass of fatty tissue and its production in hypodermic fatty cellulose is higher than in visceral fatty depots.

Table 1

Biochemical and immunological parameters of blood at patients with CHD
median (25th percentile; 75th percentile)

Blood indicators	stable stenocardia n=32	unstable stenocardia n=29	p...
Leukocyte, $\times 10^9 / l$	5,70 (4,80; 6,30)	6,55 (5,77; 9,57)	0,007
HDL, mmol/l	1,30 (1,00; 2,00)	0,86 (0,77; 1,16)	0,000
VLDL, mmol/l	0,59 (0,44; 0,79)	0,82 (0,62; 1,13)	0,027
Aterogenost coefficient	3,13 (2,73; 4,29)	4,15 (3,32; 6,05)	0,031
CRP, mg/ml	4,41 (2,64; 9,11)	8,55 (4,52; 17,05)	0,013
IL-8, pg/ml	5,00 (2,80; 16,49)	18,26 (10,12; 31,05)	0,009
TNF- α , pg/ml	3,11 (2,20; 5,50)	8,68 (4,43; 13,83)	0,000
IL-4, pg/ml	3,00 (1,50; 4,00)	1,99 (1,70; 2,83)	0,047
Leptine, ng/ml	20,58 \pm 3,66	32,45 \pm 4,71	0,049

For the purpose to assess interrelations of the leptin level at stable and unstable stenocardia the correlation analysis is carried out. At patients with stable stenocardia the level of leptin had direct correlations with BMI ($r=0,424$; $p=0,016$), quantity of leukocytes ($r=0,479$; $p=0,009$), concentration of atherogenous triglycerides ($r=0,410$; $p=0,022$), and also the return correlation with the relative quantity of lymphocytes ($r = - 0,377$; $p=0,044$), i.e. only 4 relations were established.

The analysis of interrelations at unstable stenocardia revealed the greatest number of interrelations: direct correlations with BMI ($r=0,456$; $p=0,017$), with a thorax circle ($r=0,455$; $p=0,019$) and waists ($r=0,410$; $p=0,034$). From indicators of peripheral blood the level of a leptin directly correlated with the relative quantity of monocytes ($r=0,770$; $p=0,000$), concentration of erythrocytes ($r=0,492$; $p=0,020$) and with value of speed of subsidence of erythrocytes ($r=0,456$; $p=0,033$). For biochemical indicators direct correlations with aterogenic ratio ($r=0,455$; $p=0,019$), concentration of enzymes ASAT ($r=0,482$; $p=0,019$), GGT ($r=0,611$; $r=0,001$), general kreatinkinaza ($r=0,428$; $p=0,033$) and return correlation with the level of anti-atherogenous HDL ($r = - 0,482$; $r=0,015$). The analysis of interrelations of the leptin level with immunological parameters established **positive** correlations with pro-inflammatory cytokine of IL-6 ($r=0,681$; $p=0,000$), IL-8 ($r=0,551$; $p=0,002$), IFN- γ ($r=0,492$; $p=0,011$) and also regulatory cytokine of IL-10 ($r=0,628$; $p=0,001$). The leptin level at patients with unstable stenocardia had also close direct correlation with the relative maintenance of T-lymphocytes (CD3+) ($r=0,592$; $p=0,004$) and the

return correlations with the relative quantity of NK cells (CD16+) ($r = -0,438$; $p = 0,041$), the level of an expression of molecules of adhesion of CD62L+ (L-selektina) ($r = -0,442$; $p = 0,039$), CD11b + (α M-chain of an integrin) ($r = -0,512$; $p = 0,015$). Nature of communications specifies that the leptin level grows with growth of cardiovascular risk. In figure 2 various cases of interrelations of the leptin level with the relative content of monocytes and a pro-inflammatory cytokine of IL-6 are presented, at a stable current of CHD interface - minimum, and at destabilization – maximum.

Fig. 2. Various nature of interrelations of the leptin level with inflammation markers (monocytes and IL-6) at patients with stable stenocardia (on the left) and unstable stenocardia (on the right)

The data of the correlation analysis obtained by us testify to various nature of the established interrelations at patients depending on the CHD form. The number of correlations at unstable stenocardia (19 communications) was more than 4,75 times, than at stable stenocardia (4 interrelations). It should be noted that at patients with unstable stenocardia the strongest positive correlations of the leptin level with inflammatory markers are: monocytes ($r = 0,770$; $p = 0,000$), IL-6 ($r = 0,681$; $p = 0,000$) and regulatory cytokine of IL-10 ($r = 0,628$; $p = 0,001$), and also relative content of T-lymphocytes (CD3+) ($r = 0,592$; $p = 0,004$).

Thus, at unstable stenocardia there is growth of the concentration of leptin and amount of its interrelations not only with traditional factors of cardiovascular risk (BMI, a waist circle, a dislipidemiya, etc.), but also with markers of inflammatory process, activation of immune system that gives the chance to consider increase of the leptin level as one of predictive criteria of destabilization of the current of CHD increases.

CONCLUSION

1. The interrelation of leptin with BMI is much more expressed in comparison with indicators of the circle of a waist, hips and a thorax.
2. At patients with unstable stenocardia the leptin level is significantly increased in comparison with patients with stable stenocardia.
3. Destabilization of a current of CHD is characterized by sharp increase in number of correlations interrelations of the leptin level (in 4,75 times) with factors of cardiovascular risk and markers of inflammatory process.



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Influence of Chronic Diseases of a Hepatoduodenopancreatic Zone on Results of Laparoscopic Cholecystectomy

ABSTRACT

The results of 2778 cases of surgical treatment of cholelithiasis are analyzed in this article. The authors detected that the combination of chronic cholelithiasis with diseases of the hepatoduodenopancreatic zone significantly increases risk of performing the laparoscopic cholecystectomy (LCE). High frequency of adhesion is considered as a prime factor, requiring the development of a modified surgical approach. When determining the surgical approach of cholelithiasis treatment in the combination with virus hepatitis it is viable to be guided by immunoenzymometric markers of hepatitis activity. In immunologic inactive forms of virus hepatitis the surgical treatment of cholelithiasis is justified as it restores an appropriate bile outflow and eliminates the inflammatory process. Applying the laparoscopic cholecystectomy at patients with diabetes was justified as well, it preventing obviously the development of destructive forms of cholecystitis.

Keywords: laparoscopic cholecystectomy, cholelithiasis, complications of surgery.

INTRODUCTION

In last decades, laparoscopic cholecystectomy (LCE) has become one of the most important innovations in treating cholelithiasis. Doubtless advantages of endovideosurgery attracted attention of surgeons globally and presently, LCE became the 'golden standard' of treating the cholecystolithiasis. Despite the long-term LCE performance all over the world, there was still a problem of risks and complications of LCE [2], which stipulates applicability of researches held in this field for clinical medicine.

MATERIALS AND METHODS

The article presents 2778 cases of cholelithiasis surgical treatment by materials of the National Center of Medicine of the Republic of Sakha (Yakutia) for 2008 - 2013.

Among hospitalized patients, there were 2303 women (82,9%) and 475 men (17,1 %), which corresponded to literature data on cholelithiasis prevalence. An average age of the patients made up 49,2 years, i.e. mainly active able-bodied persons suffered of cholelithiasis in 70,2 % of

cases, presenting a big socioeconomic problem. Analyses by residence zones showed that among village people the cholelithiasis was more frequent than at urban population.

Considering a matter of surgical approach under combination of the chronic cholelithiasis with coexisting diseases of hepatoduodenopancreatic zone organs, choice of tactical decisions was determined by the necessity of accurate detection of a disease stipulating the main patient's complaints, which was complicated due to similarity of clinical findings in one anatomic zone. Very important aspect of the problem was the necessity of proper evaluation of risk factors of recurrence and development of polypathia in postoperative period and prognosis of polypathia on distant results of surgical treatment.

RESULTS

Combination of the *cholelithiasis and hepatitis* [1] represented an important problem of surgical approach both in diagnostic and the following phases of treatment. We studied 325 (11,7 %) cases. At that, in majority of findings there was a combination with chronic inactive hepatitis noted - 187 (57,5 %) cases, active forms of hepatitis were detected at 127 (39,1 %) people. Among 325 patients, there were 211 (64,9 %) ones with serum hepatitis and 114 (35,1 %) ones with hepatitis C. It ought to be noted that under this combination, the chronic hepatitis and cholelithiasis redoubled each other. [2]. As such, presence of HBs or HCV antigens had not principal importance to solve the matter of performing LCE. In case of detecting hepatitis B or C antigens at a patient it was obligatory to study markers of virus process activity. Additionally, detection of even one positive marker of activity was estimated as active virus process and the planned surgery was postponed till holding the full course of immune therapy at an inflectional diseases' hospital. In postoperative period, all patients received a course of hepatotropic therapy by all means. Of 325 patients, operations were performed on 187 (57,5%) ones without preliminary course of antivirus therapy, and 127 (39,1%) patients with immunological symptoms of activity received a preoperative course of immune therapy with roferon by a standard scheme. In postoperative period, under detailed study no patient from the both groups had reactivation of hepatitis detected, which could be credited to surgical intervention. Thus, in our opinion, when determining surgical approach under combination of virus hepatitis and cholelithiasis it was viable to be guided by immunoenzymometric markers of hepatitis activity. Under immunologically inactive forms of virus hepatitis surgical treatment of cholelithiasis was justified as it restored an appropriate bile outflow, eliminated a phlogistic focus and by that 'broke vicious circle' of mutual confounding influence of these two diseases.

41 (1,5 %) patients who received laparoscopic cholecystectomy had *nonparasitic hepatic cysts*. Also hepatic haemangioma was detected in 10 (0,4%) cases. Under the nonparasitic hepatic cyst, we considered laparoscopic fenestration of hepatic cyst as the surgery of choice. We performed such surgery at the same time with cholecystectomy in 33 cases. There were no any complications in cases of simultaneous laparoscopic operations (cholecystectomy and cyst fenestration). Thus, under combination of the cholelithiasis and nonparasitic hepatic cysts, performance of the simultaneous operations was justified.

We examined *parasitic hepatic and biliary system diseases* in 19 (4,8 %) cases. Combination of helminthic infection with intraductal localization of parasites and chronic cholecystitis gained the special complication due to mutually confounding influence. Bile outflow disorder caused by the intraductal parasites and chronic biliary ducts inflammation could lead to development of terebrant obturational cholecystitis, cholangitis and cholestatic hepatitis. From our point of view, the surgical approach under the cholelithiasis at patients with approved helminthosis of biliary system should be maximally active. In postoperative period, a course of anti-helminthic therapy is necessary. 12 patients got such methodic and had smooth postoperative period. By the end of the treatment course, 11 (91,7 %) of them cured from helminthic infection and just 1 patient was transferred to a specialized inflectional hospital for further treatment by reason of inefficiency of anti-helminthic therapy.

Combination of **pancreatitis and cholelithiasis** was detected at 347 (12,5%) patients, including 17 (4,9 %) cases referred to terebrant reactive pancreatitis. In all cases, a form of pancreatitis was classified as a hydropic pancreatitis. Prevailing majority of patients suffering from chronic pancreatitis had alcohol addiction. In all cases of terebrant reactive pancreatitis and also in cases of performing the LCE on the early stages of polypatia development at 271 (82,1 %) patients, we reached the good clinical effect concerning both cholelithiasis and pancreatitis. Under the control study, held in 12 months, a considerable decrease or full disappearance of acute pancreatitis' episodes was declared, normalizing the biochemical activities and ultrasound structure of pancreas. In cases when surgery was performed on the background of far reaching indurative changes of the pancreas at 59 (17,9 %) patients, we watched symptoms of chronic pancreas as the independent disease at 36 (61 %) patients. Thus, under combination of cholelithiasis and chronic pancreatitis, early diagnosis of the polypathia was important and the surgery approach in this case was to be active and aimed at performance of early LCE.

Diabetes and cholelithiasis. Combination of these diseases formed 3,1 %. Studying the risk of developing the acute destructive cholecystitis at patients suffering diabetes showed that at



86 observed patients who refused the planned LCE, the acute cholelithiasis developed at 34 (39,5%) people. This aspect witnessed on the necessity to hold early surgical treatment of the cholelithiasis at diabetes patients. Thus, surgical treatment of the cholelithiasis in combination with diabetes was the complicated task. At the same time, early application of LCE at this type of patients was justified as it gives the possibility to prevent the development of destructive forms of cholecystitis. Very important factor having great value in treating the diabetes patients was the small injury of LCE and therefore, the low number of pyoinflammable complications.

Analyzing complications of laparoscopic cholecystectomy, we firstly tried to determine the valuable factors of complications' development connected with concomitant diseases of hepatoduodenopancreatic zone organs. Among 2778 surgeries in 65 (2,3%) cases, operations ended with transfer to sternolaparotomy. Complications occurred in 30 (1,1 %) cases, including perioperative ones diagnosed during the surgery at 15 (0,6 %) patients. Also, 15 patients had postoperative complications. There were no fatal cases after LCE.

The main reasons of conversion were connected with the adhesion. In 33 (50,9 %) cases, the direct reason of the conversion were massive visceroparietal and visceral adherence. In 9 (13,8%) cases, difficulties of anatomic orientation were attributed to causes of conversion which were also connected with presence of visceral adherence. As the result, almost 65 % of conversions were connected exactly with the adhesion. So, all 8 cases of biliary duct injury (0,28 %) correlate with presence of visceral adherence. Complications related with intake of troacars (0,25 %) in 7cases occurred just due to adhesion in abdominal space. Among postoperative complications also 3 (0,09 %) cases outstood which were connected with separation of visceral adhesion. The rest complications were typical for LCE in quantity and quality relations. Number of cholelithiasis complications at patients with concomitant diseases of hepatoduodenopancreatic zone organs turned out to be higher than at patients without accompanied pathology.

So, on the basis of the clinical material analyses it was established that combination of cholelithiasis and diseases of hepatoduodenopancreatic zone organs increased the risk of performing LCE. Additionally, the high prevalence of adhesion is considered the basic risk factor, which demands development of modified surgical approach.

SUMMARY

1. When determining surgical approach under combination of virus hepatitis and cholelithiasis it is viable to focus on immunoenzymometric markers of hepatitis activity. Under



immunologically inactive forms of virus hepatitis, surgical treatment of cholelithiasis is justified as it restores an appropriate bile outflow and eliminates a phlogistic focus.

2. LCE application is justified at patients with diabetes, as it gives the opportunity to prevent development of destructive forms of cholecystitis.

3. Combination of cholelithiasis with diseases of hepatoduodenopancreatic zone organs reasonably increases the risk of LCE execution. At that, the main risk factor is big frequency of adhesion, which demands development of modified surgical approach.

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Clinical and Dynamic Features of Formation and Course of Alcoholism at Women Depending on Climatic and Geographical Living Conditions in the Territory of the Republic of Sakha (Yakutia)

ABSTRACT

The features of clinical manifestations of alcoholism among various ethnogeographical groups of the indigenous female population of the Republic of Sakha (Yakutia) are studied. The mortality rate of women due to alcohol abuse amounts from 40,6 to 57,89% and tends to grow. A high-gradient type of the course of alcoholism at women Sakha living in the moderate zone is established. Some biochemical deviations in blood composition at women abusing alcohol are revealed.

Keywords: alcoholism, women, Sakha, Evens, indigenous people, Arctic North, current, Republic of Sakha (Yakutia).

TOPICALITY. The ethnocultural features of the epidemiological characteristic of alcoholism and alcohol psychoses in different regions of Siberia and the Far East which are characterized by ethnic, geographical and gender features, features of a metabolism of ethyl alcohol and a form of alcoholism at representatives of various ethnoses was established by the famous domestic scientists in the field of addictology [3, 6, 8-12, 16].

In the Republic of Sakha (Yakutia) the indicator of prevalence of alcoholism is rather high and takes the 4th place in the Far East Federal District (FEFD) [1].

In 1991 the morbidity of women alcoholism in the Far East exceeded the all-Russian indicator and was the highest in the country - 524,6 on 100 thousand female population. Further this indicator continuously increased, and made 574,1 in 1995 and 616,6 in 1999 on 100 thousand population respectively. It is natural that morbidity of women alcoholism reached the peak in the most problem (in the narcological relation) subjects of the Far East region: Chukotka Autonomous Area – 1586,8; The Magadan and Sakhalin areas – respectively 1277,2 and 933,7 on 100 000 women [9].

The gender causal investigative interrelations reflecting clinical and pathogenetic and clinical and dynamic stages of formation of alcoholism and alcohol psychoses was established by the leading researchers of addictology [2, 5, 12, 15, 17].



The analysis of dynamics of alcoholism and its consequences at the population of the Far East and Siberia showed that the indigenous female people on average dies of alcoholism at much younger age, than the drinking indigenous man's and alien female people. One of the alcoholism reasons at indigenous people is loss of folk customs, traditions, family foundations, self-beliefs, and dynamics of the alcoholism depends and from climatic and geographical conditions of accommodation. It proved relevance of the accounting of ethnic and cultural features, ethnic and geographical conditions of accommodation when studying a problem of female alcoholism for improvement of preventive and medical measures.

Thus, studying of questions of female alcoholism and its transformation in the conditions of the Arctic North is an actual problem of circumpolar medicine.

The objective of this research was studying of clinical and dynamic aspects of formation and the course of alcoholism among the women suffering from alcoholic addiction and living in different climatic and geographical zones of the Republic of Sakha (Yakutia).

MATERIALS AND METHODS. The clinical sampling including 261 women suffering from alcoholic abuse, representatives of native nationalities of the Republic of Sakha (Yakutia) – Sakha (Yakuts) and Evenks was surveyed. From their number 4 ethnogeographical groups are allocated: the women Sakha living in the moderate zone (**SMB**)-53, Sakha, living in the subarctic and Arctic zones (**SSAAB**)-33, the Sakha of vilyuysky group of regions (**SVGR**)-30, Evenks of subarctic and Arctic belts (**ESAAB**) – 69 pers. The control group included 29 women Sakha which middle age made 48,5 years, and 47 Evens at the age of 46 years (only 76 women). The material is gathered during the period from 2009 to 2014 on the basis of the Yakut republican narcological clinic, and also during forwarding departures to Eveno-Bytantaysky, Verkhoyansky, Nizhnekolymsky and Srednekolymsky national regions of the Republic of Sakha (Yakutia).

Criteria of inclusion in the studied selection were mature age (from 18 to 68 years), compliance of a clinical picture at the time of research to diagnostic criteria of the diagnosis on MKB-10, F10.2 corresponding to codes. The main material of the study has been the Card of standardized description of surveyed on a basis of the research work "Pathobiologic Foundations of Clinical Heterogeneity of Mental and Behavioral Disorders due to Use of Psychoactive Agents", it being elaborated in the Scientific Institute of Mental Health (authors: the member correspondent of the Russian Academy of Sciences, MD, professor N. A. Bokhan, MD, professor A. I. Mandel, etc.). The research is conducted according to the state contract No. 1134 from 17.06.2011 on carrying out the research work "The medical and social aspects of

alcoholization of the population of the Republic of Sakha (Yakutia)". The determination of activity of biochemical indicators was made on the automatic biochemical analyzer on the basis of laboratory of an immunopathology of FPBSI "Yakut scientific center of complex medical problems". Processing of results was carried out with use of a package of the applied SPSS 17.0 programs for Windows. The results are presented in the form of average sizes and a standard error of the average size ($M \pm m$). The assessment of reliability of distinctions of average sizes is carried out with use of t-criterion of Student. The significance value was considered reliable at $p < 0,05$.

Results and the discussion. Official data Sakha (Yakutia) Stat for 2009-2013 years testify to high prevalence of alcoholism among the female population of the republic. At the same time the indicator of primary incidence of alcoholism and alcohol psychoses among women for 2013 decreased by 27,5% (fig. 1).

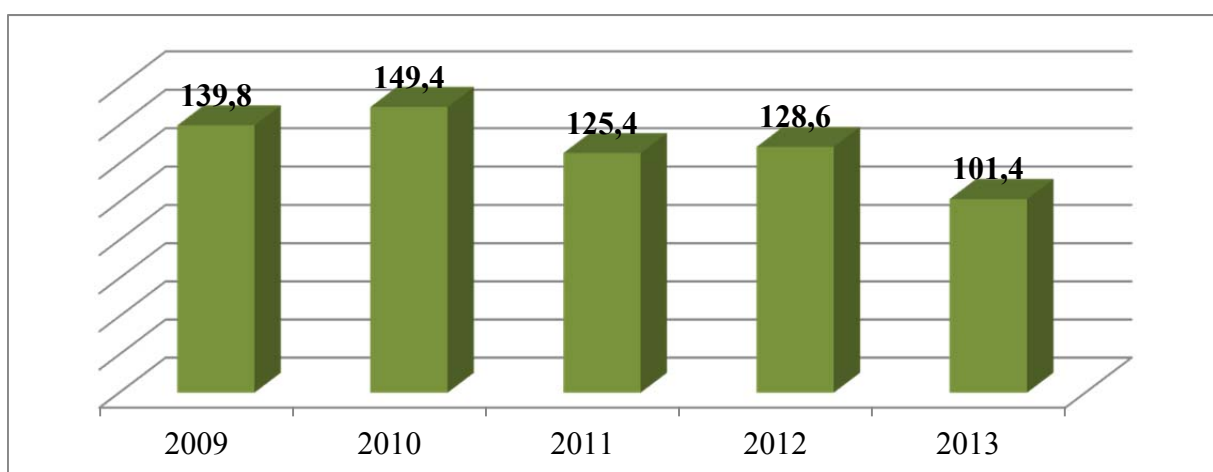


Fig. 1. Dynamics of primary incidence of alcoholism and alcohol psychoses among the female population of RS(Ya) on 100 thousand female population.

During the statistical analysis authentically significant interrelation of a level of primary incidence of alcoholism and alcohol psychoses among the female population with a mortality indicator among women because of alcohol was noted ($r=0,88$, $p=0,05$), the rate of it in the general mortality makes from 40,6 to 57,89% and tends to grow (tab. 1).

Table 1

The mortality of the population connected with alcohol intake in RS(Y)

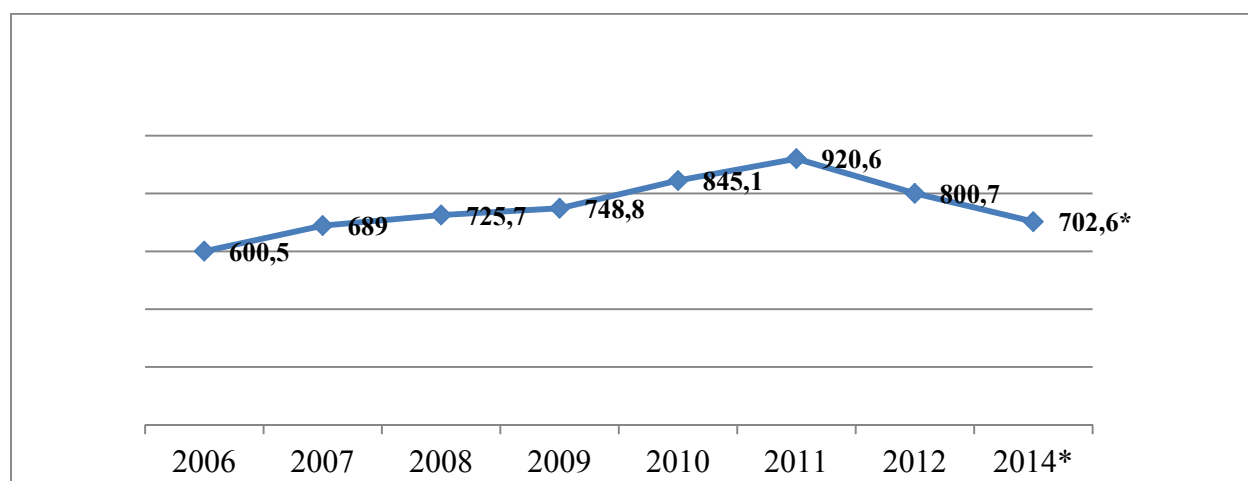
	2000	2005	2007	2008	2009	2010	2011	2012	2013
General mortality due to alcohol intake per 100 thousand adult	19,7	61,5	32,3	47,5	53,4	65,8	50,2	35,6	31,0

population

Mortality of women 8 28,3 15,9 27,5 28,9 32,9 22,2 17,7 16,3
due to alcohol intake
per 100 thousand

female population

A rate of women in 40,6 46 49,22 57,89 54,1 50 44,2 49,7 52,6
general mortality rate
due to alcohol intake,
%



* Data are provided from calculation of number of the female population on 01.01.2014.

Fig. 2. Dynamics of morbidity alcoholism of women in the Republic of Sakha (Yakutia) on 100 thousand female population

Morbidity alcoholism in the Republic of Sakha (Yakutia) among the female population tends to decrease. So, with 920,6 in 2011 the indicator decreased by 23,6% in 2014 (fig. 2).

In 2014 in the Yakut republican narcological clinic there were 22450 (2012 - 26234) people within a year who addressed with narcological frustration, among them – 4680 (2012 - 5381) women that makes 20,8% of all cases of addressed women to the narcoclinic and 1% of all female population of the republic. Thus 1606 (2012 - 1534) women lived in rural areas, of them 819 (2012 - 946) addressed for the first time in life that makes 34,3 and 17,5% (2012 - 28,5 and 17,6) from among the addressed women respectively. In the structure of narcological frustration the alcohol addiction syndrome for 2014 is diagnosed at 15521 people (2012-18454). In 2014 in 3452 women with alcohol addiction addressed to the clinic, of them the I stage of alcoholism



was noted in 414 (2012 - 572), II – 2974 (2012 - 3274), III-64 (2012 - 89) women 3452 (2012-3935). The number of women addressed for the first time amounted 485 against 551 in 2012. In total all over the the republic 704 (2012-782) cases of alcohol psychosis were registered, including 156 (22,2%) (2012 - 165) - among women, being diagnosed with alcohol psychosis for the first time - 80 cases (2012 - 81) or 24,2% of all cases with alcohol psychoses.

Average age of the surveyed was noted at Sakha women from the subarctic and arctic zones (further SSAAB) in $38,57 \pm 10,32$ years, Sakha from the moderate zone (further SMB) – $42,26 \pm 11,18$, Sakha of vilyuysky group of regions (further SVGR) - $39,30 \pm 7,65$, Evens of the subarctic and arctic zones (further ESAAB) – $41,28 \pm 10,00$ years. Clinical and the dynamic features of development of alcoholism were characterized by rather late beginning of systematic alcohol intake, on average: at SSAAB in $24,80 \pm 5,26$ years, at SMB in $28,29 \pm 9,18$, at SVGR in $26,00 \pm 7,71$, at ESAAB – in $27,60 \pm 7,97$ years, despite earlier experience of the first test of alcoholic drinks at SSAAB and SVGR in $18,7 \pm 3,58$ and $17,66 \pm 3,88$, and at ESAAB and SMB $20,13 \pm 6,87$ and $21,83 \pm 7,47$ of year respectively. Loss of quantitative control before all was formed at women SSAAB - in $28,26 \pm 7,47$ years, at the others it was on average noted in 30 years. The age of formation of an alcohol abstinence syndrome varied from 30 to 32 years. The age of the beginning of hard drinking alcoholism was defined: at SMB – $32,72 \pm 7,84$, at SSAAB – $32,19 \pm 8,2$, at SVGA- $30,73 \pm 7,02$, at ESAAB – $32,36 \pm 8,18$ years.

Despite the remoteness of Evens revealed on the basis of studying of mitochondrial DNA from other populations of Yakutia and close genetic relationship of populations central and the Yakuts from the vilyuysky region [16], the clinical and dynamics formation of alcoholism in the studied selections had the features. So, terms of formation of physical alcohol addiction at the women of indigenous ethnic origin living in different climatic and geographical zones RS(Ya) are determined: before all physical dependence is formed at women Sakha of the moderate zone - in 3 years since systematic alcohol intake, with identical term the first symptoms of physical dependence are shown at Evens of subarctic and Arctic belts and at Sakha of vilyuysky group of regions- in 4 years; most long physical addiction develops at the women Sakha living in the Arctic and subarctic RS(Ya) zones - in 7 years (tab. 2).

Thus, in 3 alcoholism studied groups the course is defined as average, including the group of the Even women. In the group of the women Sakha living in the moderate zone of Yakutia (in the central group of areas), alcoholism had a high progredient type. The established features in clinical dynamics of alcoholism at women from different ethnic and geographical

territories testify to necessity of further research of predictors of alcohol formation at natives of the Arctic North taking into account climatic and geographical living conditions.

Table 2

Features of clinical and dynamics of alcoholism at female indigenous population of RS (Ya)

Middle age	ESAAB n=69	SMB n=53	SSAAB n=33	SVGR n=30
Women with alcohol addiction	41,28±10,00	42,26±11,18	38,57±10,32	39,30±7,65
First test of alcohol	20,13±6,87	21,83±7,47	18,7±3,58	17,66*±3,88
Beginnings of systematic alcohol intake	27,60±7,97	28,29±9,18	24,80±5,26	26,00±7,71
Losses of quantitative control	30,17±8,4	30,95±9,07	28,26*±7,47	30,66±8,55
Formations of symptoms of intoxication	31,73±8,5	31,09±8,47	31,41±8,81	29,77±7,72
Formations of an alcoholic abstinence syndrome	32,36±8,18	31,67±8,41	32,04±8,87	30,73±7,02
Beginning of dipsomania	33,32±9,35	32,72±7,84	32,19±8,2	32,30±7,39
Assessment of progredient course of alcoholism according to N. Ivantsu	average (4,76)	fast (3,38r)	average (7,24л.)	average (4,73r.)

* $r=0,03$

The biochemical laboratory researches of the women with alcohol addiction revealed that the activity of lactatdehydrogenaza (LDG) was authentically high, the level of glucose tended to increase, the level of creatinine was authentically low (tab. 3).

The tendency to decrease in level of urea which is combined with authentically low level of creatinine, and also high activity of LDG and rather high level of glucose in comparison with the control that specify that intensive process of glycolysis is observed at the women abusing alcohol.

Table 3

The biochemical indicators of women with alcohol addiction

Biochemical tests	Controls (n=76)	Patients (n=28)
Lactate dehydrogenase, un/l	433,8±11,0	509,4±20,1*
Creatinphosphokinase Nac, un/l	60,8±4,3	71,7±10,1
Creatinphosphokinase MB, un/l	16,7±1,2	19,5±1,8
Alkaline phosphatase, un/l	228,4±9,1	218,0±11,0
Scale of glutamyl transferase, un/l	40,4±4,2	38,2±4,3
Alaninaminotransferase, un/l	11,5±1,1	14,8±1,7
Aspartate aminotransferase, un/l	25,7±1,6	29,6±2,8
Glucose, mmol/l	4,52±0,09	4,72±0,19
Urea, mmol/l	4,45±0,15	3,92±0,19
Creatinine, µmol/l	82,66±1,29	73,64±2,97*
General protein, g/l	77,79±0,43	77,09±0,90
Albumine, g/l	44,55±0,29	44,03±0,47
Triglycerides, mmol/l	0,96±0,05	0,88±0,07
Cholesterol, mmol/l	4,86±0,12	4,69±0,21
CS Lipoprot. of high density, mmol/l	1,29±0,05	1,44±0,07
CS lipoprot. of low density, mmol/l	3,16±0,10	2,85±0,18
CS lipoprot. of very low density, mmol/l	0,45±0,02	0,40±0,03
Potassium	3,27±0,20	2,41±0,18*

*- p< 0,05

Conclusions. It is established that the earliest systematic alcohol intake is observed at women Sakha of the subarctic and arctic zones - in 24,80±5,26 years that for 4 and 3 years earlier, than at Sakha from the moderate zone and at Evens of subarctic and arctic zones respectively. The high-progredient type of alcoholism is established at women Sakha of the moderate zone - in 3 years, average type - at Evens of the subarctic, arctic zones and Sakha from the vilyuysky region, subarctic and arctic groups of regions - in 4 and 7 years respectively.

Some biochemical deviations at the women abusing alcohol are revealed: the tendency to lowering the level of urea which is combined with authentically low level of creatinine, as well as high activity of LDG and rather high level of glucose in comparison with the control that indicates intensive process of glycolysis in abusing alcohol.

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Development of Fee-based Medical Services in the Republic Sakha (Yakutia) on the Example of the Republican Hospital № 1 – National Center for Medicine

ABSTRACT.

Preconditions for implementing fee-based medical services in state budgetary institution of health care and analysis of these services for the last three years are presented.

Keywords. Fee-based medical services (PMS), Program on the state guarantees (PSG), funding of healthcare (FH).

INTRODUCTION.

The main task of "Republican Hospital №1 - National Center for Medicine" (RH №1 - NCM) State-financed Institution activity of Sakha Republic (Yakutia) is to execute PSG of providing free medical care to citizens of the Republic Sakha. The NCM activity influences on such health indicator of the republic population as mortality and birth rate, maternal mortality, infant mortality, perinatal mortality and diseases of circulatory system.

Every year in NCM: almost 20 thousand people are treated in in-patient department, more than 70 thousand people come to out-patient department and they conduct 350 thousand visits; there are more than 2 million researchers and more than 10 thousand operations; almost 2 thousand child delivering. We continue to execute a "Health" national project at all eight directions, including state federal assignment on providing high tech medical care for cardiovascular and neurosurgery issues. Moreover, experts of NCM annually realize planned departures as well as emergency departures in districts. 69 planned departures in 27 districts of Republic and 153 emergency departures in 29 districts were made over 2013.

At the last years planned values of PSG are increasing: compared to 2011 in 2013 number of bed-day increased in 4,5%, patient-day in 17,1% and the number of visits is maintained at the same level.

At the end of 2013 the execution of PSG on outpatient care is 103,9%, on hospital care - 107,2%, and on hospital-replacing care - 138,8%. The bed space is highly used. The bed turnover was 27,8, the annual average of bed occupation - 337,4, the average length of hospital stay - 12,1. These indicators are higher than average indicators of Sakha Republic and Russia in general.



In 2013 planned values of PSG were based on the planned capacity of NCM. Thus, NCM keeps its pledge on providing free medical care to citizens and even exceeds beyond the planned capacity and existing resources on range of services.

PSG exceeds authorized manning table. The highest percentage of plan exceeding is achieved among the clinics in the department of allergy-immunology (28%) and in audiology center (22%). Providing PMS to people in RH No1 - NMC is done in accordance with active legislation and statute of institution by the contract of compensated provision of PMS. It should be noted that in connection with the adoption of the Federal Law "On the health protection basis of citizens in Russia" PMS were regulated not by subordinate act, but by federal law for the first time.

To distinguish flows of patients on the free and fee-based service at the NCM have been created some extra budgetary entities since 2003: advisory department (adult's clinic); children advisory department (children's clinic); diagnostic in-patient department with 10 beds; two cabinets of ultrasound diagnostics. Providing of PMS is organized during off-duty hours with compulsory scheduling for the main work as well as for providing fee-based services and two-shift working of diagnostic departments on providing fee-based services with approved schedule. The separate accounting and storage of expendable materials, reagents, medicines purchased at the expense of mandatory medical care insurance, budget and extra budgetary funds is applied.

Over thirteen years we made a coordinated scheme of work with insurance companies and organizations. In 2013 we signed 19 agreements with insurance companies on voluntary medical care insurance (VMI). Two of them are regional and 17 are federal. It provides medical services to 78 juridical person and 84 contracts on compensated medical services with organizations.

The share of income from extra budgetary and other income-generating activities is the total amount from 7 to 9% of financial resources in recent years. In 2012 extra budgetary incomes were 129 million rubles. In 2014 it is going to be 171,7 million rubles. Despite such impressive values of financial funds, funding of NCM on PSG amounts for 83% from the level subject to funding standards (the resolution of Government of Sakha Republic (Yakutia) №440 from 29.10.2007). The deficit of PSG support during the last three years is about 250 million rubles per year.

The structure of income from extra budgetary and other income-generating activities in recent years did not change. The bulk of funding comes from providing medical services which

is on the average 78%. On the second place is food organization - from 5 to 9% and on the third place is domestic services of renting placements which is on the average 7%.

In the structure of expenses of income activities, the main part of expense goes on labor payment - 55% in 2011, 48% in 2012 and 45,5% in 2013. All categories of workers get piece work pay from incomes providing paid services. The expenses under the article 340 "Increasing the cost of material inventories" during the last two years amounted to 23-24%. The cost structure also includes payments for work as the third place rating 10-13% by specific weight. It should be noted that the acquisition of the raw material and medicine used in providing fee-based services produces on extra budgetary and it depends on legislation that regulates purchases for state needs.

The equipment purchased by the budget takes part in providing fee-based services, and the deterioration of the equipment may be definitely included in the cost of services. Moreover, compensation of the equipment deterioration purchased by the budget and used for income-generating activities, is carried out in NCM by applying a share of the income derived from the providing of fee-based services. In 2013 the NCM bought shipments and services used for realization of PSG for more than 23,6 million rubles that is 19,8% of all expense to funds from income-generating activities.

The main reasons of RH №1 - NCM inducing to render fee –based services are as follows:

1. First of all, to meet the demand of the population in medical services which can't be provided within PSG and to let the patient make choice.
2. The lack of funding from the budget and compulsory medical care insurance (CMI). The additional source of funding is directed to cover the resource deficit in providing free medical care to citizens.

The restriction of PMS will lead to violation of constitutional rights and limiting the access of medical care. The guarantees relating to free medical care should be provided with adequate funding (where the demand for fee-based services will decrease) rather than depriving citizens' choices.

In accordance with two federal laws: from 21.11.2011 №323-FL "On the basis of health protection in Russian Federation" and from 08.05.2010 №83-FL that changed legal status of state institutions, we face with the following tasks:



- to continue further separation of patients on free and fee-based services. For that matter more effective alternative would be separation of structural units on budgetary and extra budgetary;

- to continue the introduction of complex programs directed to people's health care such as "Day off clinic", "Healthy baby" and so on.

In difficult economic situation getting extra budgetary income is compulsory measure necessary for normal functioning of the large medical facility of the fourth level. Nevertheless, while the State ensures the full tariffs on medical services, the share of PMS should gradually decline in state medical facilities.

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The Validity of Application of a SWOT-Analysis in Assessment of Results of Implementation of the Territorial program of State Guarantees for the Far East Region in 2011-2013

ABSTRACT

To define the possibility of application of SWOT analysis in the social and economic sphere a multi-stage model of SWOT outcome analysis of realization of the Territorial program of state guarantees for the Far East federal district for 2011-2013 has been implemented. The algorithm of a five-stage SWOT analysis is formed by ranking and assessing their interrelation. The results of the work confirmed that due to the flexibility of SWOT analysis it is possible to apply it in various spheres. The application of the multi-stage analysis allows to reveal major and minor factors as well as to carry out the detailed analysis of interrelations between them and to define the further strategy.

Key words: the territorial program of state guarantees, SWOT-analysis, compulsory health insurance, quality and accessibility of medical care.

SWOT-analysis is defined as a method of strategic planning to identify factors of internal and external environment of the organization and their division into four categories: Strengths, Weaknesses, Opportunities and Threats. Initially, the technology of using the SWOT-analysis was proposed in 1965 by Harvard University professors Lerner, Christensen, Andrews, and Guth for the development of business strategies. This method is quite versatile, in connection with what is considered to be useful not only in economics and management, but also in the areas where goals have complex social or socio-economic features (6,8).

Classical methodology of the SWOT-analysis is adequately described in literature (2,3) and includes three main stages: 1) identification of factors which characterize the internal and external structure of the subject; 2) assessment and ranking of the factors determined; 3) formulation of strategies for the development of the subject based on the intersections of SWOT factors pairs.

Applying this method allows to explore the elements and define their interaction depending on their goals, it can also be used for rapid assessment and strategic planning for the long term. Using the method, as a rule, does not require special knowledge or education (8).



However, the SWOT-analysis results are usually presented as a qualitative description, while assessing of the situation often requires quantitative parameters. SWOT-analysis is quite subjective and highly dependent on the observer's position and knowledge. As a result, the qualitative SWOT-analysis needs a large amount of different information which requires significant efforts.

According to literature the experts' attitude towards SWOT is rather ambiguous. A number of authors argues that findings formulated on its basis are descriptive in nature without recommendations and prioritizing. They use epithets like "it's just a surface description", "a brief statement of well-known circumstances, a static image, an initial catalog of questions for further consideration", which could give "initial rough checklist only" (1,6,10).

However, the validity of this analysis allows us to rank these or other factors on the likelihood of their realization and impact on the situation, as well as analyze the impact and interaction of factors in conducting a thorough multi-stage algorithm for creation of the SWOT-analysis (7).

Thus, the main aim of the work was to observe the SWOT-analysis applied for assessment of the results of the Program of state guarantees for free medical care to citizens of the Russian Federation in 2013.

MATERIALS AND METHODS

The analysis was applied to the results of the Program in 2013 in comparison with 2011 and 2012 and the results of the realization of the Territorial program of government guarantees for medical care (TPGG) during the reporting period in the Far East Region on a basis of the official data of the Russian Ministry of Health.

The SWOT-analysis algorithm:

1. To evaluate the data presented in accordance with their positive and negative dynamics, therefore to choose main parameters influencing the change in the situation, both for the better and for the worse. The prior indicators which determine the achievement of the main aim of the Program: TPSG deficit reduction, an increase in effectiveness and satisfaction with the quality of medical care (4). The results are documented in the matrix (Table 2).
2. To share the internal and external factors which influence the effectiveness of the TPSG realization.
3. To assess opportunities and threats according to their probability of occurrence and the degree of influence on the situation in question.

4. To perform the analysis of interaction of opportunities/threats and strengths/weaknesses in the realization of the Program. The results are documented in the matrix (Table 3).

5. To rank the factors identified according to their importance and produce the final results of the analysis (7).

Results

One of the priorities in realizing the Program in 2013 is the redistribution of medical care towards hospital substitution and outpatient technologies. It is clearly seen in the structure of medical care costs under the Program (Table 1).

Table 1

The structure of medical care costs within the Program from 2011 to 2013.*

Terms of care	2011	2012	2013
Costs from all sources of financing	1 596,9 bill. Rubles	1 718,4 bill. Rubles	1676,4 bill. Rubles
Ambulance	11,178 bill. Rubles/10ths. people(7,0%)	12,372 bill. Rubles/10ths. people(7,2%)	11,232 bill. Rubles/10ths. people(6,7%)
Outpatient care	52,059 bill. Rubles/10ths. people(32,6%)	57,051bill. Rubles/10ths. people(33,2%)	58,003bill. Rubles/10ths. people(34,6%)
Outpatient emergency care	-	-	1,341bill. Rubles/10ths. people(0,8%)
Specialized hospital care	91,822bill. Rubles/10ths. people(57,5%)	97,09bill. Rubles/10ths. people(56,5%)	91,531bill. Rubles/10ths. people(54,6%)
Inpatient care	4,631bill. Rubles/10ths. people(2,9%)	5,327bill. Rubles/10ths. people(3,1%)	5,532bill. Rubles/10ths. people(3,3%)

*excluding the cost of other services.

On the initial stage the strengths and weaknesses of the Program in 2013 were considered, as well as the main opportunities and threats that may affect the achievement of the established standards (Table 2).

Table 2

Realization of the Territorial program of government guarantees (2013). SWOT - analysis.

Internal factors	Strength	Weaknesses
	<ul style="list-style-type: none"> • Increased share of medical care costs on outpatient and inpatient facilities • Growth of per capita funding of the Program • Increased spending of financing for the realization of the Program by 15.0% from all sources compared to the previous year • Reduction of the cost of hospital care • Creation and realization of TPGG by the subjects of the Russian Federation in accordance with the Program • Increase of hospital substitution technologies • Increase of inpatient and outpatient medical care • Reduction of hospital medical care • Increase of HTMC • Reduction of Program deficit • Implementation of standard of palliative medical care • Reduction of ambulance and increase of outpatient emergency medical care • Implementation of standards of prophylactic medical care 	<ul style="list-style-type: none"> • Imbalance of the TPGG (depending on the performance in regions) • The standards to provide medical care within inpatient care by the Program are not reached • Exceeding the average standard of medical care in hospitals within the Program • Uneven distribution of hospital care (the standard for region budget has not reached and the one for CHI has exceeded) • Insufficient development of palliative medical care • Insufficient development of preventive medical care • Absence of emergency medical care in 26 subjects of the Russian Federation • Insufficient development of medical rehabilitation • Non-compliance with medical care payment methods recommended by the Program (in a number of subjects)

External factors	Possibilities <ul style="list-style-type: none"> Increasing of palliative, preventive and emergency medical care in accordance with the target standards of the Programs More efficient use of available resources in order to improve the quality of medical care (target setting of the health care reform) Focus of the state programs on technical equipment of the outpatient department in order to improve the diagnostics and possibly reduce the level of hospitalization Review of financing: increase in the share of Program funding provided by CHI Reallocation of funding sources between the costs of the federal budget and CHI fund for the purpose of more effective use of resources Realization of financial obligations to provide medical care in regions by the subjects of the Russian Federation 	Threats <ul style="list-style-type: none"> Lack of the state and regional budgets Reduction of the total share of free medical care costs Lack of awareness and skill level of the units providing medical care and defective system of their interaction and feedback Extension of the period of hospitalization due to the lack of continuity in the outpatient sector, including the worst of medical equipment and shortage of qualified personnel, as well as unnecessary duplication of research in hospitals Climatic and geographic location and transport accessibility (for remote regions of the Russian Federation) Instability in the foreign policy situation Underestimating the necessities for certain types of medical care

*CHI - compulsory health insurance

According to the generalized data in the realization of the Program for 2013 the prevalence of strengths was noted.

However, the basic analysis is hardly applicable to solve important strategic tasks. It is necessary to evaluate the factors interaction.

According to the algorithm, the priority opportunities and threats were identified that had a real impact on the results of the Program (item 3 of the algorithm).

The strengths and weaknesses of the Program formed on the basis of identified "opportunities" and "threats" were noted as a very important step for the development of strategic directions. The analysis of the main interacting groups "Opportunities - strengths/weaknesses", "Threats - strengths/weaknesses" let us structure problems of the Program and formulate ways of their solving with the existing and prospective resources. The data are presented in a matrix (Table 3, Appendix).

These data determined "functional" opportunities and threats depending on the degree of importance of their impact on the overall system. Thus, the final stage formulates the main strategic directions based on their importance. The strategy is formulated on the basis of matrices (point 5 of the algorithm).



Strategic directions of the Program realization:

a) to take into account strategic opportunities requiring the concentration of all the necessary resources for their realization and related threats demanding constant attention and constant monitoring with direct fund allocation from the federal budget with partial funding from the **CHI** (including the basic benefits package);

b) to take into account strategic opportunities allowed to rank as the release of required resources and threats requiring monitoring. The monitoring is allowed of the two possible sources accordingly the significance of the level (territorial budget of the Russian Federation subjects with the support of the federal budget) with partial funding from the **CHI** (including in the basic benefits package);

c) to take into account strategic opportunities or threats to the current order. They are mainly controlled by regional authorities, funded from the territorial budget (funding is not excluded from the CHI).

Recommendations

I. In order to improve the quality and accessibility of medical care it is offered:

1). to create a new (functional) approach to the formation of schemes of development and placement of the network of the health facilities with the possibility of revising the existing nomenclature of health facilities from including regional peculiarities;

2). to allocate the total capacity of the network through the levels (stages), characterized in the first place, the degree of complexity of medical technologies. At the same time both efficiency and availability of medical care should be taken into account;

3). to increase the volume and regional availability HTMC through the creation and support of medical care in appropriate institutions within a radius of "normative affordability" following the Conception of Health Care of the Russian Federation until 2020, as well as the Message of the Russian President;

4). It is advisable to divide medical care depending on the needs of the region population: the emergency assistance of the circulatory system diseases should be conducted in most institutions engaged in acute coronary syndrome medical care, but the routine surgical care of the circulatory system diseases should be concentrated in a limited number of specialized institutions (depending on the necessities of the region and hospital facilities);

5). it is recommended to identify reserves due to the rational structural differentiation of resources and forward them to provide a higher level of medical care necessities (regional and federal support of highly intensive technologies, grants from local budgets);



6) to determine the level of accessibility and quality of medical care as one of the reference criteria of the effectiveness of realization TPGG, and based on that to carry out a complex assessment and dynamic control performance.

II. In order to reduce the deficit of financial support of TPGG within the budget of the Russian Federation regions:

- 1) to distribute funding of strategic directions of the Program with priority realization;
- 2) to introduce effective methods of medical care payment with the performance indicators of medical organizations and to follow the payment methods provided by the Program;
- 3) to adopt financial support liabilities of medical care not included in the basic benefits package by the subjects of the Russian Federation;
- 4) to pay particular attention to TPGG planning in remote regions of the Russian Federation in order to mitigate the lack of financial support (to be able to redistribute financing).

III. task of effective global restructuring of medical care in the country / region at all levels of diagnostic and treatment process is defined (ambulatory care, hospital care, emergency care, HTMC) on condition that the high quantity of the doctors and hospital beds availability are ensured, with a low resource potential of the Russian health care system (9).

1) reasonable capacity planning of medical care in accordance with the demands and the economic component, such as further development of the day hospitals and inpatient technologies with a proportional decrease in the hospital medical care without compromising the availability and quality of care;

- 2) Improving the quality of outpatient care by the way of:
- enhancing the credibility of outpatient care facilities
 - improving staffing and the skills of personnel structure
 - cooperating hospital specialists and outpatient ones
 - realizing the possibilities of primary care physicians to improve in the cardiovascular diseases treatment and maintaining cardiac patients in practice (5,11).

- 3) Improving the efficiency of inpatient care by the way of:
- focus on maximizing surgical activity by hospitalization of patients for surgical treatment only;
 - addressing patients for surgical treatment by the decision of prehospital medical commissions or transferring from the therapeutic department, where the cost per bed-day is much lower;



- foundation of specialized centers / departments with differentiate therapeutic and surgical targets (with capabilities of providing HTMC and without it);
- promotion of preventive medical care as well as emergency and palliative ones.

Conclusions

1. The flexibility of SWOT - analysis can be used in various areas of social and economic sphere.
2. The elementary (one-stage) SWOT-analysis is designed for preliminary assessment of the directions and orientation for a further detailed analysis.
3. It is difficult to take into account all conditions and hidden factors affecting the final result. In this connection with the elementary analysis it is possible to detect only priority areas which are insufficient to formulate the final practical recommendations.
4. It is advisable to use a step-by-step approach to the SWOT-analysis for obtaining more accurate information based on both primary and secondary factors and to avoid factors "congestion" with the loss of mainstream of analysis.
5. The use of multi-stage analysis reveals major and minor factors and provides a detailed analysis of their relationships.

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Some Clinical and Epidemiological Features of Rotavirus Incidence at Children in the Republic Sakha (Yakutia)

ABSTRACT

The article presents an analysis of the long-term rotavirus infection incidence in children of the Republic Sakha (Yakutia), and a comparison of the age structure of children hospitalized in the Children's City Clinical Hospital № 2 during the epidemic season 2012-2013. The detection rate of the rotavirus antigen has been identified in patients with symptoms of acute enteric infection as well as the main clinical manifestations of rotavirus gastroenteritis.

Key words: acute enteric infection, rotaviral infection, rotavirus, gastroenteritis, rotavirus antigen.

INTRODUCTION

Rotavirus is one of the issues to be actually concerned with practical public health service and medical science, it is confirmed by unfavorable statistical data: annually rotavirus is the cause of about 25 million outpatient attendances, 2 million hospitalizations and over 500 thousand fatalities worldwide (about 30% of all fatal cases among juniors) [9,10,11]. Rotavirus gastroenteritis is widespread and is the most common of all acute enteric infections that leads to the development of severe diarrhea with dehydration in children during their first years of life [3]. According to the World Health Organization data, almost every child, regardless of their race and socioeconomic status, within their first five years of life has rotavirus gastroenteritis, which causes considerable economic damage to the health care system and the society on whole [8,12]. In this respect, rotavirus is unique, since it is the only in a wide range of diarrheal diseases that is so obviously age-related [5].

In the recent years all over the world including the Russian Federation, there has been prevalence of rotavirus incidence in children. Since 1993 in Russia it has increased over 20 times (from 3.2 per 100 thousand people in 1993 to 71.6 in 2013) [1,4]. For 2011-2013 there were 99,384, 100,889, 102,485 registered cases of rotavirus gastroenteritis, of which 90.4% - 91.1% fell on children under the age of 14 [7]. Rotavirus infection accounted for 44-47% of all acute enteric infections in children under 5 years of age. Up to 5% of fatal cases among children till 5 years are induced by rotavirus gastroenteritis. Rotavirus gastroenteritis is especially severe in children aged 6-24 months [6]. The abovementioned facts call for effective therapeutic and preventive measures against rotavirus gastroenteritis [3].



The aim of the research: to determine clinical and epidemiological features of the rotavirus incidence in the child population in the Sakha Republic (Yakutia).

MATERIALS AND METHODS

The present study was carried out in the Infectious Bacterial-Diagnostic Department of SBI RS(Y) Children's City Clinical Hospital № 2 (CCCH№2). The analyses of 810 medical records of inpatient children with the diagnosis of rotavirus gastroenteritis were examined during the epidemic season 2012-2013. The prevalence rate of the rotavirus antigen in patients with the clinical picture of acute enteric infection was estimated on a basis of data from the clinical-diagnostic laboratory. The study of feces was conducted by immune chromatographic assay (IChA) for one-stage qualitative detection of rotavirus antigen by RotaStick (NOVamed Ltd, Israel) testing systems. The sensitivity of the testing system is 97.3%, specificity - 97.4%, the antigen luminal value - 106 particles/ml. For the comparative analysis of the long-term incidence of rotavirus infection in the republic and the Russian Federation, official statistics provided by the Directorate of Rospotrebnadzor for the Sakha Republic (Yakutia) were applied.

The research involved commonly used statistical methods; statistical processing and graphic presentation of the data are done with the use of standard Microsoft Office package programs (Excel, Word, 2010).

RESULTS AND DISCUSSION

Before 2008 the clinical laboratory diagnostics of rotavirus infection in the republic was possible only in the Virology Laboratory of the Center for Hygiene and Epidemiology in the Sakha Republic (Yakutia), which did not allow the total coverage with diagnostic tests. With the introduction of the laboratory diagnostics of rotavirus infection in the CCCH № 2 in 2008, the etiological decoding of acute enteric infections in children hospitalized in Yakutsk has been conducted regularly, so the present study covers the period from 2008 to 2013.

Over the past six years (2008-2013) in the republic there has been growth of the etiological role of viral agents of the gastrointestinal tract infectious pathology, their parameter increasing from 47.2% in 2008 to 73.2% in 2013 in the structure of causative agents of the acute enteric infections of proven etiology. The rotavirus infection accounts for up to 90% in the structure of viral enteric infections.

Since 2008 the incidence of rotavirus infection increased by three times, and at the end of 2013 it amounted to 85.4 per 100,000 people. Since 2009 the incidence in the republic has exceeded the average Russian incidence rate, with the latest figure at 19.3% in 2013 (Fig. 1).

In the Sakha Republic (Yakutia) the rotavirus infection is registered all-the-year-round and as in other regions of the country, it is characterized by winter-spring seasonal incidence rate from December to April with the peak in February-March. Such within-year incidence dynamics is confirmed by statistical data of the Infectious Bacterial-diagnostic department of the CCCH № 2. In the epidemic season 2012-2013, 66.6% of patients with laboratory-confirmed diagnosis of the rotavirus infection were hospitalized in the period from December to April with the maximum percentage of hospitalizations (34.1%) observed in February and March.

The main incidence of rotavirus infection occurs in the child population under 6 years, but with a different proportion of individual age groups. The maximum risk was noted among children at first year of life with average 47.8% in the course of six years of the study, followed by children of 1-2 years - 42%, 3-6 years - 8%, 7 - 14 years - 2%.

As mentioned above, the age group of the highest risk of rotavirus infection are children in their first year of life, whose incidence rates (937.3 - in 2008; 2,259.4 – in 2013) were higher than that of children under 14 years of age by 6-7 times (127.0 – in 2008; 381.0 – in 2013) during the analyzed period. (Fig. 2)

The share of children under 1 year hospitalized in the Children's City Clinical Hospital № 2 in the season 2012-2013 made 86.5%. A more detailed analysis of the age structure of the patients showed that 3.7% of the total number of children admitted to hospital were children under the age of 3 months, 15.8% - 6 months, 67% - 12 months. The percentage of children aged 18 months was 11.5%, 2 years - 2%. Thus, the results confirm that children of 1 year are the most vulnerable group to rotavirus infection in the republic.

The analysis of the incidence in pre-school children revealed that children attending daycare institutions of 3-6 years are more vulnerable than non-attending ones, since the former get infected through everyday contacts in kindergartens. The incidence in children attending kindergartens is 364.4 to 100,000 (61.3%), the incidence among children who do not attend child care centers - 230.4 to 100.000 (38.7%).

For 2008-2013 in the clinical-diagnostic laboratory of the CCCH № 2, the rotavirus nature of diarrhea was established in 2,954 children, or 23.1%, of 12,788 children with acute enteric infection with the use of immune chromatographic method. The high prevalence rate of rotavirus antigen was observed in the age group up to 2 years - 25.4% and from 3 to 6 years - 16.9%. In school-age children of 7-14 years this figure was 4.7% (Table).

The molecular-biological method used in other regions allowed to detect the rotavirus



diarrheal diseases with increased verification at 58.2%, which enables timely adjustment of causal treatment and rejection of antibacterial drugs, given the confirmed viral nature of the disease [2]. However, our study has testified that the rotavirus is widespread among children of the republic in the epidemic season.

The analysis of clinical incidences of the disease distinguished the following typical manifestations of rotavirus infection: symptoms of catarrhal inflammation of the upper respiratory tract were observed in 92% children of 6 - 12 months, and 87% in children older than 12 months. Symptoms of gastroenteritis with watery stool were observed in 91% children of 6-12 months, while 100% children were over 12 months old. It should be noted that in the early days of the disease the catarrhal syndrome prevailed, which resulted in referral diagnosis. The acute respiratory viral infection was diagnosed in 62% inpatients of 6-12 months and in 69% children over the age of 12 months. The diagnosis of acute enteric infection in the prehospital phase was made for 38% patients of 6-12 months and 31% patients over 12 months.

The vast majority in all age groups, or 92%, had temperature rise up to 37.5 - 39 C. 4% of the patients suffered from a fever reaction in 39 C and above, and 4% of the patients had a slight increase up to 37.5 C (Fig. 3).

The coprogram of sick children revealed neutral fats in moderate concentration in 91-100% of the cases, muscle fibers in 43-66, a small amount mucus in 13-17%.

Taking into account the fact that Yakutsk is a home to almost a third of the child population, and the CCCH № 2 also provides medical care to children from regions of the republic, results obtained in the study, including the incidence rates of rotavirus, can be extrapolated to the bulk of the child population.

Like any other infectious disease, the rotavirus infection can and should be prevented. Until recently the prevention of rotavirus infection was limited to sanitary-hygienic measures. In October 2012 the Russian Federation registered Rotatek, a vaccine against rotavirus, proven to be effective and safe means for specific prevention of rotavirus gastroenteritis in numerous clinical trials. In the Sakha Republic (Yakutia), the possibility to immunize infants appeared in 2014, and over this year, the preventive vaccination against rotavirus infection was provided to over 200 children. At present, the small coverage with immunization cannot significantly affect the incidence. However, following the recommendations of the World Health Organization, the annual increase of vaccination coverage will promote reduction of intensity of the rotavirus epidemic process, as well as decreasing the number of hospitalizations, outpatient visits and prevent fatalities.

CONCLUSION

The results of the study on the clinical and epidemiological features of rotavirus incidence of the child population of the Sakha Republic (Yakutia) show the higher prevalence rate of rotavirus infection in the structure of confirmed acute enteric infections (up to 90% of the cases) and demonstrates the growing trend every year.

The rotavirus infection is characterized by seasonality, with the maximum hospitalization of patients in the winter-spring season; it mainly affects children under the age of 2 years, with the maximum incidence at first year of life, though children under the age of 6 months are also involved in the epidemic process.

The leading syndromes of the disease include the syndrome of acute gastroenteritis, symptoms of catarrhal inflammation of the upper respiratory tract and the fever reaction.

Laboratory diagnostics of the rotavirus infection is carried out only in the city of Yakutsk; thus, the recorded incidence is incomplete to reflect the overall intensity of the epidemic process in the republic, it requiring the expansion and modernization of laboratory facilities, introduction of high-tech methods of research, re-examination of the rotavirus infection.

It is necessary to get the maximum immunization coverage; therefore, listing of the vaccination against rotavirus infection in the Regional Calendar of Preventive Vaccinations in the Sakha Republic (Yakutia) should be considered as a priority.

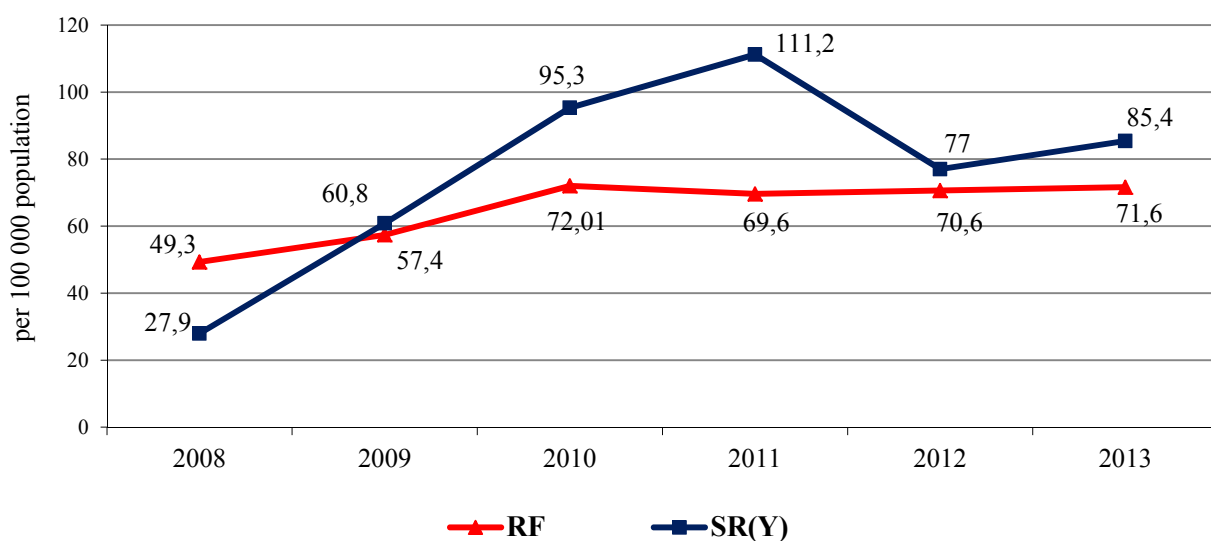


Fig. 1. Rotavirus incidence rates in the Sakha Republic (Yakutia) and the Russian Federation, 2008 – 2013

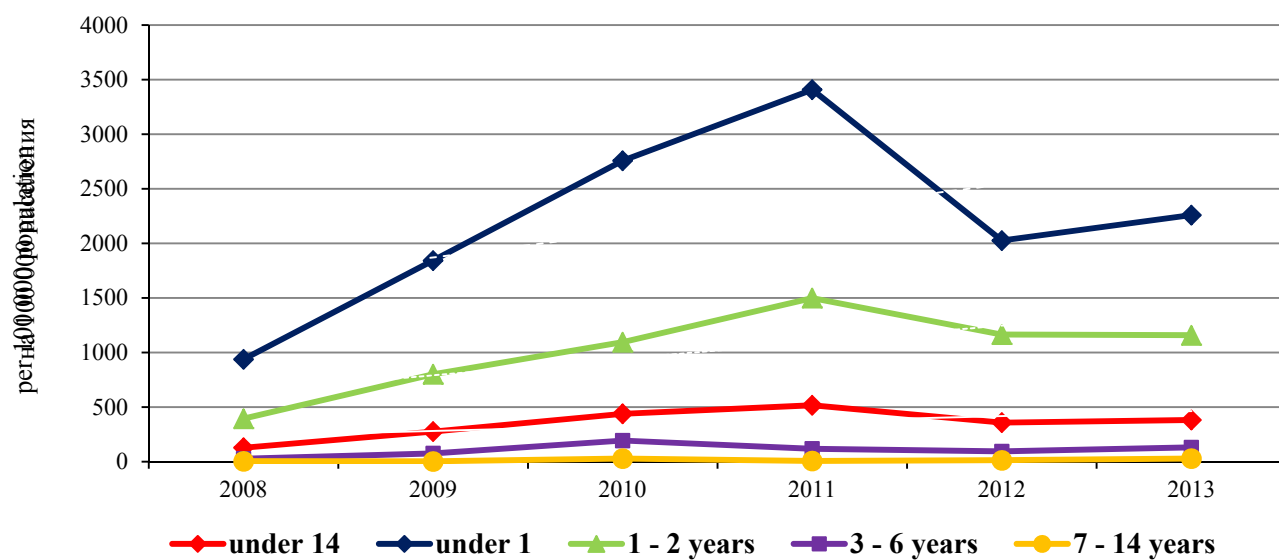


Fig. 2. Rotavirus incidence at children in the Sakha Republic (Yakutia), 2008 – 2013

Rotavirus antigen detection rate in the clinical material of the patients with acute enteric infection

Years	Examined in total	Incl. (+) for rotaAG		0-2 years			3-6 years			7-14 years		
				Total	Incl. (+) for rotaAG		Total	Incl. (+) for rotaAG		Total	Incl. (+) for rotaAG	
		abs.	%								abs.	%
2008	1257	42	3.3±0.5	1077	35	3.2±0.5	128	7	5.5±2.0	52	0	0.0±0
2009	2725	512	18.8±0.7	2175	476	21.9±0.9	488	35	7.2±1.2	62	1	1.6±1.6
2010	1456	557	38.3±1.3	1120	446	39.8±1.5	278	108	38.8±2.9	58	3	5.2±2.9
2011	2801	918	32.8±0.9	2156	737	34.2±1.0	513	176	34.3±2.1	132	5	3.8±1.7
2012	2781	708	25.5±0.8	2098	660	31.5±1.0	574	44	7.7±1.1	109	4	3.7±1.8
2013	1768	217	12.3±0.8	1183	176	14.9±1.0	355	24	6.8±1.3	230	17	7.4±1.7
Total:	12788	2954	23.1±0.4	9809	2530	25.8±0.4	2336	394	16.9±0.8	643	30	4.7±0.8

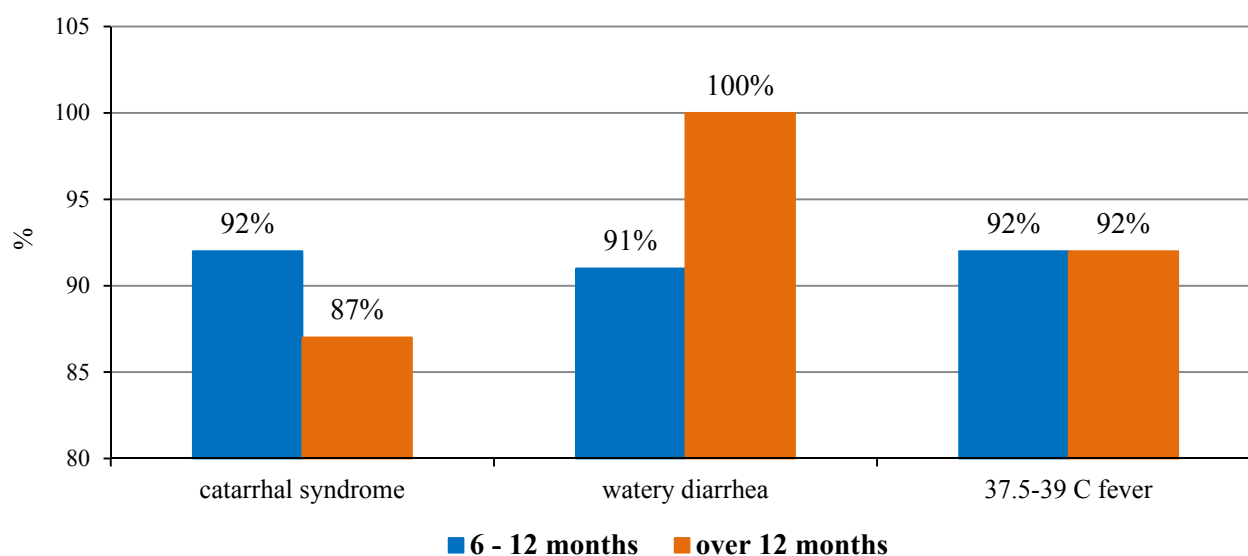


Fig. 3. Main rotavirus symptoms at patients treated at the Children City Clinical Hospital No. 2



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Medical- Social Examination of Condemned Disabled People in Corrective Penal Colonies of the Federal Penitentiary Service Department of the Republic Sakha (Yakutia)

ABSTRACT. Medical-social examination of condemned disabled in corrective penal colonies of Federal Penitentiary Service department of the republic of Sakha (Yakutia) (further, FPSD) has been studied, an analysis of condemned people's disabilities in the Central hospital of FPSD has been conducted and basic causes of disability among the condemned have been established, arrangements for disabled people rehabilitation in the medical colonies of the Republic of Sakha (Yakutia) have been offered.

Keywords: Health care organization, medical departments of penal system, medical-social examination of the condemned disabled people, disease incidence, disability.

INTRODUCTION Negative tendencies in health state of the incarcerated people are caused by both their medical-social peculiarities, and severe living conditions in penitentiary establishments [1,3,5]. On October 1, 2011 there were 774942 people in the corrective penal colonies of the Russian Federation. 35852 of them were the people with an active form of tuberculosis, 62387 had psychological disorders, 58830 – drug addicts, 22779 – alcohol drinkers, 55423 - HIV-positive carriers [3].

The condemned disabled people in the conditions of social isolation have a special status demanding some special attention of the state and penal administration. According to January 1, 2011 there were 25 108 condemned disabled people in Russia that makes 2,9% of total number. I group - 692, II group - 11488, III group - 12 928 disabled people [2].

The number of people whose disability was established by social-medical examination service at the residence before condemnation, amounted for 19 331 (77,1%). In 2010 5659 people got the primary disability in the prison that makes 21,5% of total number of the condemned disabled people [1].

Studying the social and hygiene conditions, quality and timing of health care, incidence structure of the condemned in colonies is necessary for improving medical care and development of the health service system in the Republic of Sakha (Yakutia).

The aim of the research is medical-social examination of the condemned disabled people in corrective penal colonies of the federal penitentiary service department (FPSD) of the Republic of Sakha (Yakutia).



MATERIALS AND METHODS. The research has been done on the basis of the Central hospital FPSD of Yakutia, where the condemned people from 5 colonies, the pretrial detention centre and the colony-settlement were examined and treated.

The inspection and re-inspection of the condemned people in the Bureau of medical-social expertise is regulated by the order of the Ministry of public health and social development and the Ministry of justice of Russia №640/190 at 17.10.2005 «About the order of organization of medical help to the people in prison» and carried out monthly by the circuitor commission of the Bureau of medical-social expertise №3 from Yakutsk.

The primary documentation included statistic in-patient cards, ambulance cards, in-patient medical cards, an individual rehabilitation program of the disabled given by FSI forensic medical examination. Statistic, analytical methods of the research and copies of record-report data of the Central hospital of FPSD from 2011- to 2013 period have been used.

Results and discussion. Many condemned disabled people led asocial life style before imprisoning and did not pass timely re-examination of FME at the residence. Doctors of medical and sanitary departments of FPSD of Yakutia presented condemned disabled people on re-examination to social-medical expertising again within the first three months. Directed to social-medical expertising, the convicted passed necessary diagnostic examination in the FPSD Central hospital and in specialized medical establishments of Yakutsk.

The analysis of structure of disability among the condemned in penal colonies of the Republic of Sakha (Yakutia) has shown the following results. According to MSE from 2011 to 2013 period, among 311 condemned presented at MSE, 269 of them were recognized disabled, 42 were not recognized. 74 condemned were recognized disabled for the first time that numbered 27,5% of the total rate and 195 passed the second re-examination that comprised 72,4% of the total number.

The age distribution of the condemned disabled people has revealed that middle age was from 30 to 45 years old.



Table 1. Primary disability by groups from 2011-to 2013.

Groups Years	I group		II group		III group		Permanent group		Permanent group		III	Total
	Absolute number	%	Absolute number	%	Absolute number	%	Absolute number	%	Absolute number	%		Absolute number
2011	-		4	18,0	18	82,0						22
2012	2	10,5	4	21,0	13	76,5						19
2013	2	6,0	6	18,0	19	57,5	1	6,0	5	12,5		33
Total	4	5,5	14	19,0	50	67,5	1	1,3	5	6,7		74

The table shows that in 2011, 22 condemned were recognized disabled for the first time, 82% of them have the third group of disability, 18% - the second group. In 2012, 19 people had primary disability, the third group - 76,5%, the second - 21%, the first-10,5%. In 2013 primary disability has been established among 33 condemned, the third group – 70%, including permanent – 12,5%, the second group - 24%, including permanent - 6%, the first group - 6%. The third group of disability - 67,5% has been prevailing for three years.

Table 2. Reevaluation disability by groups from 2011-to 2013.

Groups Years	I group		II group		III group		Permanent group		Permanent group		III	Total
	Absolute number	%	Absolute number	%	Absolute number	%	Absolute number	%	Absolute number	%		Absolute number
2011	1	1,5	13	19,5	37	55,0	6	9,0	10	15,0		67
2012	1	1,5	12	18,7	39	61,0	3	4,6	9	14,2		64
2013	-		9	14,2	26	40,6	11	17,0	18	28,2		64
Total	2	1,0	34	17,4	102	52,3	20	10,2	37	19,1		195

The table shows that the number of the second re-examined recognized disabled people has increased in 2,6 times in three years than with the primary disability. In 2011, 67 of the condemned disabled person were re-examined, 70% of them were the third group of disability (including –15 % permanent), 28,5% - the second group, including permanent - 9% and the first group – 1,5%. In 2012, 64 condemned passed the second re-examination: the third group - 75,2%, including – permanent 14,2%, the second - 23,3%, including permanent - 4,6%, the first-1,5%. In 2013, 64 condemned were recognized disabled for the second time: the third group – 68,8%, including permanent – 28,2%, the second group - 31,2%, including permanent - 17%.



For three year the higher prevalence rate of the condemned disabled people with III group of disability – 52,3%, including permanent - 19,1% has been noted.

The structure of primary disability is presented in Table 3.

Table 3. Structure of primary disability by nosologies among the condemned in colonies of Yakutia from 2011- to 2013 period.

Nosological form by ICD 10	2011		2012		2013		(M±m)		MH RF 2013
	Absolute number	%	Absolute number	%	Absolute number	%	Absolute number	%	%
Some infectious and parasitic diseases:	-		1	5,2	1	3,0	1	4,0	No data
among hepatitis			1		1		1		
New growths including malignant	-		-		-		-		17,61
Mental and behavior dysfunctions	-		-		-		-		3,54
Nervous system diseases	6	27,2	8	42,1	12	36,0	8,6	34,9	3,05
Eye diseases	3	13,6	1	5,2	8	24,2	4	16,2	2,94
Diseases of blood circulation system	3	13,6	-		-		3	12,2	44,58
Diseases of respiratory system	-	-	1	5,2	2	6,0	1,5	6,1	2,61
Diseases of digestion	4	18,0	-		-		4	16,2	1,79
Muscle and connective tissue diseases	4	18,0	7	36,8	8	24,2	6,3	25,6	8,39
Other classes:					1	3,0	1,6	6,5	No data
HIV	1	4,5	1	5,2					
Bradyacuasias	2	9,0							
Total: 74	22		19		33		24,6		

Within three years in the structure of primary disability at the first place refer diseases of the nervous system (34,9%), at the second – muscular-skeletal system (25,6%), at the third place – diseases of digestive organs (16,2%) and eye diseases (16,2%).

The available structure of diseases by disability in the Republic Sakha (Yakutia) differs from the structure of disability of the population of the Russian Federation where blood circulatory system diseases (44,58%), malignant tumors (17,61%) and diseases of muscular-skeletal system and connective tissue (8,39%) prevails.



In comparison with indices of the primary disability of Ministry of Health of the Russian Federation, in the Republic of Sakha (Yakutia) are as follows: 11,4 times more illnesses of the nervous system (34,9%), 9 times more diseases of digestive organs(16,2%), and eyes diseases(16,2%), 3 times more diseases of the muscular skeletal system and connective tissue (25,6%), 2,3 more times illnesses of respiratory organs (6,1%). As for diseases of the blood circulation system, indices (12,2%) of the primary disability in penal colonies of FPSD are 3,6 times lower than indices (44,58%) of the Ministry of Health of the Russian Federation.

Table 4. Structure of the second disability by nosologies among of the condemned in colonies of the Republic of Sakha (Yakutia) from 2011 to 2013.

Nosological form by ICD	2011		2012		2013		M ± m	
10	Absolute number	%	Absolute number	%	Absolute number	%	Absolute number	%
Some infectious and parasitic diseases: among hepatitis	1	1,5	1	1,5	1	1,5	1	1,5
	1		1				1	
New growths including malignant					1	1,5	1	1,5
Mental and behavior dysfunctions	2	3,0			4	6,0	3	4,6
Nervous system diseases	29	43,5	20	30,0	24	36,0	24	36,9
Eye diseases	5	7,5	5	7,8	4	6,0	4,6	7,0
Diseases of blood circulation system	8	9	6	9,3	5	7,5	6,3	9,6
Diseases of respiration	2	3,0	1	1,5	1	1,5	1,3	2,0
Diseases of digestion	1	1,5	5	7,5	6	9,3	4,0	6,1
Muscular-skeletal and connective tissue diseases	15	22,5	22	34,3	15	22,5	17,3	26,6
Other classes:					2	3,0	2	3,0
HIV			1	1,5			1	1,5
Bradyacuasia	2	3,0	2	3,0	1	1,5	1,6	2,4
Endocrine system	1	1,5	1	1,5				
Total: 195	67		64		64		65	

The structure of the repeated disability in nosological forms for this period has revealed that at the first place there were diseases of the nervous system (36,9%), illnesses of muscular



skeletal system at the second (26,6%) and blood circulatory systems at the third (9,6%), the rest of them included eye diseases (7,0%), diseases of digestive organs (6,1%), psychological disorders (4,6%).

Most condemned disabled people with diseases of the nervous system in the anamnesis had craniocerebral injuries before the colony. The contractures and amputated extremities after injuries and frostbite were the main cause for disability diagnosing among the condemned disabled people with diseases of muscular skeletal system.

The medical departments of penal colonies organized some individual rehabilitation programs: dynamic supervision, medication and recovery treatment of the neurologist, orthopedist, cardiologist, gastroenterologist, therapist, psychological rehabilitation. The wheelchairs, orthopedic footwear, cane were bought for disabled people with diseases of musculoskeletal system. According to the indications, the extremity prosthetics was carried out in the Republican rehabilitation center of veterans and disabled people in Yakutsk.

Conclusion. According to the analysis of the examination of the condemned disabled people in penal colonies of FPCD of the republic of Sakha (Yakutia) has revealed that most of the condemned disabled people are from 30 to 45 years old of asocial lifestyle. The anamnesis of risk factors of the incidence and disablement has revealed craniocerebral injuries, injuries and frostbites of extremities, irregular and unbalanced food, alcoholism, smoking and drug addiction.

Within three years in the structure of primary disability, the diseases of nervous system were the most common (34,9%), then the muscular-skeletal system (25,6%), diseases of digestive organs (16,2%) and eye diseases (16,2%). Primary disability in corrective penal colonies of the Republic of Sakha (Yakutia) in some nosological forms is several times higher, than in the Russian Federation: diseases of the nervous system in 1,4 times, diseases of digestive organs in 9 times, eye diseases in 5,5 times, diseases of muscular-skeletal system and connective tissue in 3 times, diseases of respiratory organs in 2,3 times.

The diseases of nervous system were most common in the structure of repeated disability for this period, then the circulatory and muscular-skeletal systems, eyes diseases, digestive tract diseases, mental disorders.

For improvement of the rehabilitation of disabled people in medical departments of corrective penal colonies of the Republic of Sakha (Yakutia) it is necessary to improve material base, to conduct SME at condemned disabled people in time, to have some beds for rehabilitation of disabled people with neurologic pathology on the basis of the central hospital, to give full medical, social psychological and professional rehabilitations according to individual

programs resulting in restoration and compensation of the broken functions, ability to self-service and social status of the condemned disabled people.

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Ecologic and Hygienic Assessment of Mercury Accumulation in Organs and Tissues of River Fish of Yakutia

ABSTRACT

The analysis according to results of heavy metals accumulation with mercury in fish organs and tissues in freshwater basins of Yakutia was performed. Fishes are bioindicators of basin pollution and a key link of the toxic element coming to human with food chain. The analysis of the data obtained showed 1 to 3 time increase of MPC against the standard in predatory fish - pike and perch, in non-predatory - crucian (carp), roach and dace in the industrial areas of diamond-and gold mining. And these fish species are mostly edible by people.

Keywords: ecosystem, heavy metals, mercury, toxic element, age groups

Pisces is the bioindicators of muddiness of reservoirs and important link of receipt on the food chain of toxic element in the organism of man. In the food ration of the population of Yakutia the consumption of fish products is on the fourth place after meat and milk products, bread and bakegoods. This circumstance has given occasion to the study of the most widespread fish of the freshwater systems.

Heavy metals (HM), including mercury, getting into reservoirs, contact with the buffer system of water, then alter into low soluble hydroxides, carbonates, sulfides and phosphates and form organ metallic complexes, adsorbing with sediments and accumulating in fish of the fresh reservoirs of Yakutia [15-21]. HM absorption by an organism, their transporting, co-operating with by intracellular bio structures and clearance from an organism are considered a difficult active process closely associated with general metabolism, therefore the amount of absorbed metal turns to be a factor, characterizing a state of organism on the whole, affecting biochemical processes and physiological functions of water organisms of Yakutia [13, 14].

It is well known that the common amount of metals absorbed by the organism in various ways depends on the concentration of this element in the environment and exposure time. It is specific for each organism to be able to accumulate different metals, including Pb, Hg and Cd, it being determined by its metabolism characteristics. Such point of view is based, mainly, on the results of the numerous works, obtained by comparing of metal content in tissues of different types of animals dwelling in regions with a different hydro chemical mode [4, 5, 10, 12, 23-25].



Complication and variety of the population structure testify to its stability and viability. The fish population dwelling in the studied reservoirs of Yakutia are characterized by higher simplification of their structure. The populations are presented by a small number of age-related groups and a minimum number of spawning generations. Factors such as life reduction, prevailing amount of junior age-related fish groups, decrease in growth rate and reduction of mid-size species, early pubescence, its maturity in extremely small sizes or its blocking in enhancing growth, stretched period of puberty are noted. In the conditions of chronic subtoxic influence of heavy metals there is a shift to life cycle strategy of white-fish: transition to the short monocycle.

For the analysis predatory fish (pike, perch) were studied as HM are accumulated by trophic chain, and imprecatory (roach, European carp, chir, dace), with benthos and water-plant organisms in their nutrition known as HM accumulators. The characteristics of clinical and path anatomical symptoms of fish intoxication was conducted during the first hour after fish capturing [1, 11, 24].

The results of the researches testify to the considerable accumulation to mercury in organs and tissues of both herbivorous and predatory fish.

As follows from the obtained data, the distribution of mercury in the organism depends on its species, age and season (Tab. 1-5).

As for crucian carps from the lake Ebe of the Vilyui district and the river Indigirka the mercury content at both small and large individuals is estimated within the limits of MPL (MPL for unpredatory freshwater fish 0,3 mgs/of kg of raw mass) (Tab. 2, 4).

In the muscular tissue of the crucian carp there is an insignificant decline of mercury concentrations in the winter period, that it is possibly related to deceleration of exchange processes due to temperature fall and oxygen insufficiency in the lakes of the region. Therefore in the winter period the golden crucian carp caught in the lakes of both districts does not present the special toxicological danger for food intake by the population [2].

The concentration of mercury is distributed in the body of the crucian carp unevenly in a following sequence: muscles > liver > brachiates > bowels > bones, that is explained by higher content of protein in the muscles of functional groups (- SH, =NH², - COOH, - OH) Mercury possesses high likeness [6].

In the organism of typical representative of predatory fishes - perch - from the rivers Vilyui and Indigirka the level of mercury is different and considerably higher by comparison to other types of fish, that it is related to features of its eating habit (MPL 0,6 mgs/of kg).

For the smaller individuals of perch, caught from the Vilyui below the settlement Syuldyukar (table. 2), in the muscular tissue the content of mercury in summer is 0,105 mgs/of kg lower than in winter.

For the large individuals of perch in the age from 5+ 7+ to from the Vilyui in the summer period mercury in the muscles exceeds MPL for the predatory freshwater fish in 3 times, that is dangerous for the population.

The content of mercury in different organs and tissues of perch of the Vilyui is the same as well as for the crucian carp of the Vilyui district : muscles > liver > brachiates > bowels > bones. In the muscular tissue of perches Mercury is contained in amounts exceeding maximal possible levels.

In summer for the smaller individuals of perch from the Indigirka (100 kilometers higher from the settlement Chokurdakh) in the muscular tissue the content of Mercury is practically in 2 times less than in winter. At the same time for adult individuals in the muscular fabric in summer it is estimated in 0,641 higher than the winter period. These indexes exceed maximal possible levels for predatory freshwater fish from 2 to 3 times (Table 4).

So the high content of mercury concentrations in the organism of fish in summer is possibly explained by strong technogenic influence of gold extraction industry, as the fossil mining is conducted only in summer, i.e. in this period a great amount of wash waters is thrown down into the river from industrial devices. In the icy period no works are conducted and accordingly the discharge from technological chain of the gold mining is minimized in the whole river ecosystem.

From imprecatory fish a roach in the Vilyui and a dace in the Indigirka were investigated. Eating habits of these two types are approximately similar, their food ration mainly consists of water vegetation and shallow invertebrates.

In the muscular tissue of roach individuals from the Vilyui under age 2+ the content of mercury is less than on 0,137 mgs/of kg in the summer period, as for roach individuals in age 6+ 8+ the concentration of Mercury in muscles and liver exceeds MPL in 2-3 times. In the winter period for the smaller roach individuals the Mercury content in muscles was on 0,218 mgs/of kg less than at large ones.

In the roach unlike the perch no sharp distinctions in the mercury content are revealed depending on a season. It can be explained by that large perches in summer eat mainly fish, and invertebrate organisms in winter. And the large roach individuals do not have such difference in food intake during a year. The relatively identical content of Mercury for the roach small and

large individuals can be explained by mainly plant eating habits during a year and by postnatal ontogenesis [3, 4, 8, 9].

The distribution of mercury in organs and tissues of the roach is analogical, as well as for other fish, not including a slightly higher content of Mercury in liver, than in muscles. Such distribution, presumably, is characteristic for imprecatory fish of freshwater reservoirs.

A dace caught in the Indigirka (table. 4), the content of Mercury also depended on a season and age of fish. In muscular tissue for smaller individuals 2+ in summer the concentration of Mercury is higher than in winter on 0,122 mgs/of kg, for large individuals in age from 4+ 6+ it is higher in 0,157 mgs/of kg and approximately in 2,5 time exceeds values MAC for imprecatory fish of freshwater reservoirs.

In the Chroma river the content Mercury in muscles and liver of a pike is 6+ to 4+ higher in 1,5 times in summer than in winter (Table 3). The table of Mercury content in muscles and liver of chir in age 6+ exceeds MAC in 1,3-1,7 times.

In the Kolyma (Srednekolymskiy district) a perch in age from 4+ 6 + has exceeding MAC on Mercury up to 3,1 times in muscles, 2,25 times in a liver and in 1,5 times in brachiates in summer period (Table. 5). In a winter period there is some decline of MAC of Mercury to 1,4 in muscles and 1,2 in a liver. This divergence in some case is explained by the lack of washing season in winter season and there is no amalgamation.

Unlike them, the Mercury content in muscles and organs at fish dwelling in the Amga river is considered of a lower rate and does not exceed values MAC (table. 1). Presently physiological and morphological researches of fish have a large research and practice value, because they are needed for the estimation of influence of habitat conditions on the organism of fish. As a rule, such organs of fish as brachiates, liver, buds mostly react on alterations of the habitat. The spectrum of alterations in the structure of these organs is wide enough [7].

From the medical and ecological point of view the biological activity and toxicants are considered to be the important characteristic of heavy metals.

Fish and fish products are the important source of mineral substances in food intake of the population. But at the same time it should be noted capability of fish to accumulate some microelements (heavy metals) not always is useful.

Disposing information about content of heavy metals at fish it is possible to forecast their influence on the human organism.

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Table 1

Accumulation and distribution of mercury in the organs
and tissues of freshwater fish Amgian district

period of research	age fish	muscles	liver	intestines	gills	bones
Luce (<i>Esox lucius</i>)						
summer	to 2+	0,126±0,089	0,145±0,102	0,084±0,059	0,031±0,022	0,035±0,025
	from 4+ to 6+	0,200±0,141	0,218±0,155	0,190±0,134	0,048±0,034	0,041±0,029
winter	to 2+	0,091±0,064	0,119±0,084	0,052±0,037	0,074±0,052	0,042±0,030
	from 4+ to 6+	0,103±0,073	0,190±0,134	0,047±0,033	0,097±0,068	0,054±0,038
Roach (<i>Rutilus rutilus</i>)						
summer	to 2+	0,131±0,093	0,141±0,100	0,076±0,054	0,026±0,018	0,069±0,049
	from 4+ to 6+	0,202±0,143	0,216±0,152	0,190±0,134	0,203±0,143	0,160±0,113
winter	to 2+	0,061±0,043	0,057±0,040	0,041±0,029	0,034±0,024	0,076±0,054
	from 4+ to 6+	0,156±0,110	0,189±0,134	0,047±0,033	0,168±0,119	0,133±0,094
Perch (<i>Perca fluviatilis</i>)						
summer	to 2+	0,051±0,036	0,064±0,045	0,043±0,030	0,039±0,028	0,036±0,025
	from 4+ to 6+	0,120±0,085	0,109±0,077	0,075±0,053	0,087±0,061	0,056±0,039
winter	to 2+	0,042±0,030	0,041±0,029	0,029±0,020	0,021±0,015	0,020±0,014
	from 4+ to 6+	0,098±0,066	0,077±0,054	0,041±0,029	0,054±0,038	0,043±0,030

Table 2

Accumulation and distribution of mercury in the organs
and tissues of freshwater fish Vilyui district

period of research	age fish	muscles	liver	intestines	gills	bones
Crucian carp (<i>Carassius carassius</i>)						
Summer	to 2+	0,191±0,135	0,149±0,105	0,077±0,054	0,109±0,077	0,051±0,036
	from 4+ to 6+	0,210±0,148	0,154±0,109	0,137±0,097	0,160±0,113	0,049±0,035
Winter	to 2+	0,141±0,100	0,138±0,097	0,074±0,052	0,096±0,068	0,073±0,052
	from 4+ to 6+	0,201±0,142	0,143±0,135	0,129±0,091	0,182±0,129	0,093±0,066
Roach (<i>Rutilus rutilus</i>)						
Summer	to 2+	0,584±0,413	0,342±0,242	0,121±0,085	0,315±0,223	0,133±0,094
	from 6+ to 8+	0,721±0,509	0,982±0,694	0,409±0,289	0,201±0,142	0,153±0,108
Winter	to 2+	0,494±0,349	0,283±0,200	0,132±0,093	0,292±0,206	0,091±0,064
	from 6+ to 8+	0,712±0,503	0,395±0,279	0,216±0,153	0,237±0,167	0,137±0,097
Perch (<i>Perca fluviatilis</i>)						
Summer	to 2+	0,832±0,588	0,109±0,077	0,061±0,043	0,111±0,078	0,054±0,038
	from 5+ to 7+	1,621±0,145	0,210±0,148	0,127±0,090	0,148±0,105	0,062±0,044
Winter	to 2+	0,937±0,662	0,093±0,066	0,056±0,040	0,231±0,163	0,049±0,035
	from 5+ to 7+	1,820±1,290	0,678±0,479	0,349±0,247	0,439±0,031	0,167±0,118

Table 3

Accumulation and distribution of mercury in the organs
and tissues of pike and broad whitefish Basin Chrome
(Allaikhovsky district, August - October 2006, n = 10 specimens)

period of research	age fish	muscles	liver	intestines	gills	bones
<i>Luce (Esox lucius)</i>						
Summer	to 2+	0,311±0,220	0,209±0,148	0,096±0,068	0,179±0,126	0,091±0,064
	from 4+ to 6+	0,931±0,658	0,774±0,547	0,157±0,111	0,533±0,377	0,141±0,100
Winter	to 2+	0,293±0,207	0,388±0,274	0,144±0,102	0,267±0,189	0,107±0,076
	from 4+ to 6+	0,829±0,586	0,962±0,680	0,348±0,246	0,514±0,363	0,192±0,136
<i>Chir (Coregonus nasus)</i>						
Summer	to 2+	0,194±0,137	0,142±0,100	0,098±0,069	0,145±0,102	0,073±0,052
	from 6+ to 8+	0,421±0,297	0,382±0,270	0,149±0,105	0,201±0,142	0,153±0,108
Winter	to 2+	0,224±0,158	0,183±0,129	0,112±0,079	0,112±0,079	0,061±0,043
	from 6+ to 8+	0,512±0,362	0,475±0,336	0,116±0,082	0,237±0,167	0,137±0,097

Table 4

Accumulation and distribution of mercury in the organs
and tissues of freshwater fish Allaikhovskiy district

period of research	age fish	muscles	liver	intestines	gills	bones
Crucian carp (<i>Carassius carassius</i>)						
Summer	to 2+	0,159±0,112	0,115±0,081	0,081±0,057	0,135±0,095	0,062±0,044
	from 4+ to 6+	0,176±0,124	0,156±0,110	0,162±0,114	0,170±0,120	0,135±0,095
Winter	to 2+	0,110±0,078	0,097±0,069	0,079±0,056	0,129±0,091	0,057±0,040
	from 4+ to 6+	0,151±0,107	0,147±0,104	0,159±0,112	0,156±0,110	0,127±0,090
Dace (<i>Leuciscus leuciscus</i>)						
Summer	to 2+	0,311±0,220	0,175±0,124	0,101±0,071	0,146±0,103	0,062±0,044
	from 6+ to 8+	0,762±0,538	0,692±0,487	0,139±0,098	0,506±0,358	0,120±0,085
Winter	to 2+	0,189±0,134	0,321±0,227	0,165±0,081	0,274±0,194	0,153±0,108
	from 6+ to 8+	0,605±0,428	0,590±0,417	0,221±0,156	0,490±0,346	0,167±0,114
Perch (<i>Perca fluviatilis</i>)						
Summer	to 2+	0,857±0,606	0,420±0,297	0,386±0,273	0,497±0,351	0,289±0,204
	from 4+ to 6+	1,877±1,326	1,375±0,972	0,621±0,439	0,734±0,519	0,499±0,353
Winter	to 2+	0,476±0,336	0,398±0,281	0,201±0,142	0,278±0,196	0,165±0,117
	from 4+ to 6+	1,236±0,873	0,732±0,517	0,330±0,233	0,520±0,367	0,220±0,155

Table 5

Accumulation and distribution of mercury in the organs
and tissues of freshwater fish in the area Srednekolymsk

period research	age fish	muscles	liver	intestines	gills	bones
Dace (<i>Leuciscus leuciscus</i>)						
Summer	to 2+	0,147±0,104	0,122±0,086	0,083±0,059	0,146±0,103	0,062±0,044
	from 4+ to 6+	0,576±0,407	0,365±0,258	0,165±0,081	0,311±0,220	0,146±0,103
Winter	to 2+	0,121±0,085	0,081±0,057	0,042±0,030	0,097±0,068	0,044±0,031
	from 4+ to 6+	0,211±0,149	0,149±0,105	0,108±0,076	0,183±0,129	0,089±0,063
Chukuchan (<i>Catostomus catostomus</i>)						
Summer	to 3+	0,413±0,292	0,161±0,114	0,101±0,071	0,209±0,148	0,083±0,059
	from 6+ to 8+	0,927±0,655	0,701±0,495	0,157±0,111	0,471±0,333	0,119±0,088
Winter	to 3+	0,286±0,202	0,287±0,203	0,127±0,090	0,311±0,220	0,097±0,068
	from 6+ to 8+	0,601±0,425	0,712±0,503	0,311±0,220	0,509±0,036	0,198±0,140
Perch (<i>Perca fluviatilis</i>)						
Summer	to 2+	0,932±0,656	0,401±0,283	0,516±0,365	0,521±0,368	0,311±0,220
	from 4+ to 6+	1,921±1,358	1,341±0,948	0,611±0,432	0,923±0,652	0,671±0,474
Winter	to 2+	0,576±0,407	0,311±0,220	0,276±0,195	0,311±0,220	0,211±0,149
	from 4+ to 6+	0,873±0,617	0,731±0,517	0,321±0,227	0,513±0,362	0,174±0,123



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Development of Innovative Technology of a Specialized Drink of the Functional Purpose on a basis of *Rósa aciculáris*

SUMMARY

The study has formulated biomedical and technological requirements for composition, nutrition values ratio and functional drink safety on the basis of local wild berry product *Rósa aciculáris* with reference to test indicators of actual food of children, adolescents and young people living in the North; a technological scheme of the product's production has been elaborated. With applying the results of the research technical documentation and product manufacturing specification are elaborated, a check sample is obtained. The product will be recommended in the diet as an additional source of iron, iodine, calcium and other deficiency substances, as an alternative to synthetic fizzy drinks for recovery of the younger generation.

Keywords: actual food, balanced diet, food substances, food biotechnology, functional food, berry drinks, *Rósa aciculáris*, technical documentation.

INTRODUCTION. Despite the extending product range of baby and teenage food, functional food products, there is lack of availability of the innovative food products allowing to solve a problem of compensation of nutritious insufficiency today.

One of the main reasons for it is discrepancy to the declared and actual physiological value of produced functional products, and also lack of reliable information about the principles of rational nutrition and physiological value of food products among the population in general. The specified negative factors are compounded by the advancing growth of a share in the consumer market of refined, subjected to deep industrial processing and long-time storage of products, and also by increase of degree of food contamination by xenobiotics of various origin. The special lack is detected in the range of the functional products possessing immunomodelling, antioxidant, radioprotective and adaptogenic properties. It is also necessary to note that the functional products which are available in the market or have rather high cost and therefore aren't available to use in food of this category, or are characterized by low appeal to children that levels all their valuable functional properties [4].



The Republic of Sakha (Yakutia) is the main subject of the Far East region. It is rich not only by minerals, but also by other not less important natural resources, such as the wood, herbs, berries, mushrooms, fish and other representatives of nature. Renewable and almost inexhaustible wealth of the Siberian taiga is valuable also by that in a technogenic century it is environmentally friendly [10].

The main principle of creation of a functional food product of a new kind is achievement of the highest possible level of full value and the guaranteed safety of the product. During the developing and production of products of a functional purpose it is necessary to study a chemical composition of raw materials, a nutrition value, special methods of technological processing. Functional food allows not only to keep health, but also to replace medicines in a certain measure [1, 3].

Drinks are the most technological basis for creation of new types of functional products. From the point of view of functional foods are of special interest the soft drinks of a special purpose containing physiologically valuable, safe for health, having exact physical and chemical characteristics ingredients, properties of which are defined and evidence-based [3, 4].

Drinks of prophylactic action are alternative to carbonated drinks which according to research are "often" consumed by children, teenagers and the youth living in the Republic of Sakha (Yakutia). By means of prophylactic foods it is possible to reduce number of the diseases connected with aging by 80%, diabetes – by 50%, hearts – by 25%, organs of vision – by 20% [4].

Wild-growing berries are the great base for creation of a number of innovative drinks with additional functional properties [2].

Due to the above, the **aim** of the research is the development of innovative technology of specialized drink on the basis of local berry raw materials of a functional purpose for prophylaxis of scarce elements, such as iron-, iodine, calcium and other scarce elements.

For the first time on the basis of results of one-stage epidemiological researches the monitoring of actual food and food habits among children, teenagers and youth of the Republic of Sakha (Yakutia) is carried out, parameters of food products and separate feedstuffs in a diet of children, teenagers and youth are revealed in dynamics. Levels of consumption of food products and provision of rations with separate feedstuffs depending on the power value of diets are defined. On the basis of these parameters and food habits the orientation of physiologically functional properties of specialized drink of a functional purpose on the basis of local berry raw materials as optimum source of vitamin C, B5, beta carotene, food fibers, vegetable proteins and



complex carbohydrates with high power ability is studied. The biotechnology of specialized drink of a functional purpose on the basis of local raw materials is evidence-based and developed. The choice of specialized drink with the conditional name "Rosa" for baby and teenage food as one of useful products is theoretically reasonable.

Work is performed according to carrying out of scientific research work No. 3048 "Development and deployment of innovative technologies of specialized food products of local raw materials of a functional purpose for prophylaxis of scarce elementss and alimentary dependent diseases of children, teenagers and youth" in the context of basic part of the state task in the sphere of scientific activities for the Task "2014/257 for 2014, number of the state registration 01201460283 (the head of NIR, Candidate of Medical Science. Lebedeva U.M.).

MATERIALS AND METHODS.

Researches are made on the basis of the Center of prophylactic and medical foods of the population of the North of scientific research institute of health of NEFU of M. K. Ammosov. In the course of work the standardized epidemiological research on studying of the actual food and food habits among the population with using of standard methods is conducted: polling method, frequency method and method of daily reproduction of food.

The actual food was estimated by method of individual interviewing of respondents according to standards of the international program of WHO for the integrated prophylaxis of noninfectious diseases – CINDI. In work the special questionnaire developed at Institute of Nutrition and adapted to local conditions is used.

Microbiological, biochemical researches, technological tests of receiving industrial samples of a new type of specialized berry drink from local raw materials of a functional purpose and drawing up specifications and technical documentations are carried out by the standard technique.

When carrying out experimental researches we used modern methods of the physical and chemical analysis: IF - UV-and atomic absorptive spectrophotometry, photocolormetry.

Safety of raw materials in the developed products was defined with use of modern methods and was estimated according to the content of toxic elements, microbiological and radiological indicators.

The energy value of food products was defined by calculation according to a chemical composition and to amount of the digested nutrients calculated on the basis of the energy value of the main substances.



Statistical processing of the actual material is made with using of a standard Microsoft Excel package, and also packages of the applied statistical programs STATISTICA 6.0, SPSS 12.0.

RESULTS OF THE RESEARCH.

When researching the actual food the expressed deficiency of the incoming received (proteins, fats, carbohydrates, vitamins, mineral substances and microcells) is revealed.

The analysis of the micronutrient status showed insufficiency of consumption of the main vitamins and mineral elements. The most expressed deficiency (less than 50% of norm) for children from 7 to 14 years is observed on such micronutrients as vitamin C, beta carotene, calcium, iron and zinc [6, 5].

The comparative analysis of the revealed nutritional status of children, teenagers and youth of the region with known data of a role of nutrients in activity of various systems of an organism confirmed (coefficients of correlation 0,86-0,94) an alimentary origin of the majority of the prevailing pathologies. Considering it, for optimization of the nutritional status and improvement of health of children, teenagers and youth of the region the creation of demanded types of the functional food products enriching by macro- and micronutrients deficiency of which exceeds 50%, namely by phospholipids, flavonoids, food fibers, vitamin C, beta carotene, and also bioavailable forms of calcium, iron [9].

For justification of a choice of basic food in order to create on their basis demanded functional food products, we studied preferences at a choice of food (from 7 to 14 years) and teenagers (from 14 to 18 years) of Yakutsk, it showed that the first place in a rating of children of younger age preferences is confectionery, and for teenagers it's fast food. The second place, in both age groups have is drinks, including power-drinks and cocktails. Considering the revealed needs for carbohydrate products from the simple refined carbohydrates in rations, the low nutrition and biological value of these foods, as basic products the berry drinks from local wild-growing raw materials containing high concentration of useful BAS were chosen.

It should be noted that among the factors causing the low food status of children, teenagers and youth, the essential role belongs to the economic and health- social reasons. Low social and economic level of many families doesn't allow to provide with adequate nutrition of children as this group of the population spend in the educational organizations at intensive process of training a lot of time. Considering it, the created functional product, along with the given set of physiologically functional properties, has to have the prime cost allowing to include it in the budget of food for the educational organizations; to be convenient in preparation, a



dosage, storage and transportation, and also to conform to the sanitary and hygienic requirements imposed to products of public catering. [4].

Considering the deficiency of fruit and berries revealed in rations of children, teenagers and youth, it is expedient to use products of processing of the last as bases of the created functional drinks. From positions of providing the maximum nutrition value it is expedient to carry out a choice of concrete types of berries from the product range, traditionally made in the region.

It is shown that the specified types of berry raw materials can be rather effective sources of food fibers, flavonoids, and also bioavailable minerals.

As a natural source of vitamin C and beta carotene it is offered to use dogrose powder. Such choice was caused by that the dogrose belongs to types of wild-growing raw materials, traditional for the region, [8].

Among a big variety of the bushes growing in the territory of Yakutia, the dogrose also takes a special place. Hips are rich with high content of biologically active agents, in particular, of vitamin C, or ascorbic acid, and vitamin P by which quantity the dogrose wins first place, and also thanks to the high maintenance of carotinoids, flavonoids, vitamins K, B2, E.

The drinks enriched with biologically active agents are included into extensive group of functional food, i.e. the products enriched with physiologically useful food ingredients improving health of the person.

At enrichment it is necessary to consider possibility of chemical interaction of the enriching additives among themselves and with components of the enriched product and to choose their such combinations, a ratio of components, forms, ways and stages of introduction which ensure their maximum safety in the course of production and storage [3].

The technological mode of drying of raw materials from berries by IF–radiation is worked out.

Method of preparation for drying includes in the frozen kind berries for maximum preservation of useful properties of berries, defrost of raw materials excluded.

Drying was made in the special dryer with IF – radiation. Drying of food products by infrared rays has the following advantages:

- opportunity to accelerate the process of heat treatment by increasing the capacity of the heat flux;
- reduction of bacterial contamination due to cell dehydration and coagulation of proteins protoplasm;

- opportunity to maximize the preservation of vitamins, amino acids, macronutrients, micronutrients.

When developing compoundings of concentrates of the functional drinks which received the conditional name "Rosa" we used the integral index of quality, including defined physiologically functional properties desired organoleptic characteristics and efficiency of dissolution.

Based on the analysis of biochemical properties of functional products designed block diagram creation of a specialized beverage functionality from local berries. Included in the database of physical and chemical parameters of raw materials, which can be made in a simulated product (a priori information must be constantly updated).

The flowchart of algorithm of the program of optimization of structure of compoundings of the projected specialized drink of a functional purpose on the basis of local berry raw materials is made.

The brought modern computer mathematical MathtCAD systems, Ekhse1 will be used for modeling of influence of a set and a ratio of the ingredients entering a compounding of the projected product on its carbohydrate, vitamin and mineral structure and power value and allow to make ranging, statistical processing, calculation and an assessment by quantitative criteria.

On the basis of the conducted researches the technology of receiving concentrates of functional Rosa drinks was developed. The block diagram of receiving concentrates of functional drinks is made and the technological modes are fulfilled.

Complex studying of radiological and microbiological indicators of a food additive, according to objectives of this stage of work is carried out.

In the conditions of the scientific research institute experimental laboratory of health of NEFU of M. K. Ammosov on pilot installation pilot batches of concentrates of functional drinks were developed.

The developed concentrates of drinks represented uniform powders of light brown color with the shade corresponding to a type of the used concentrate of berries.

The assessment of organoleptic indicators (transparency, color, taste and aroma) which is carried out by tasting showed that the developed drinks represent orange opaque (without suspension and a deposit) liquids with the harmonious aroma and taste corresponding to the used berry basis with notes of a dogrose and tart aftertaste.

We developed technical documentation TU specifications - 9185 – 001 – 44068275 – 2014 which extend on drinks berry of wild plants. Drinks intend for the direct use in food, and



also can be recommended as a preventive product since powder from a dogrose possesses the immunostimulating and antiseptic action.

Addition in drink of artificial dyes, the preserving substances, synthetic aromatic substances, essences isn't allowed.

The analysis of an ecological assessment of the developed technologies showed that, the content of the toxic substances found in the developed drinks was in limits of admissible concentration and met the requirements of the standard.

Results of market researches of the developed technologies show that within prospects of development and expansion of sale of finished goods animation of technology with introduction in various geographical regions of the Russian Federation can be provided, at the corresponding development the developed technologies can provide sufficient profitability and make a contribution to development of branch, in the light of the developed tendencies the developed technologies in the field of functional drinks are actual and demanded.

Researches evidence-based and developed innovative resource-saving, environmentally friendly, waste-free biotechnologies of production of functional berry products of new generation on an industrial basis, practical bases of receiving qualitatively new combined natural foodstuff on a berry basis with the set biochemical properties corresponding to requirements of an organism of peoples of the North are offered.

CONCLUSION.

In the light of the current tendencies the developed biotechnologies of production of specialized drink of a functional purpose on the basis of berry raw materials in the present stage are actual and demanded [7].

Considering that the market of functional food is very limited, the drink developed by us can take on it a worthy place. The combination of its useful properties and the acceptable price will make good argument for consumers at a product choice.

Thus, creation of functional drinks from local wild-growing berries in the Republic of Sakha (Yakutia) has strategic importance, and will allow not only to provide local population with qualitative production, but also will give the chance to enter the market of other regions of the Russian Federation, and it is possible, even for export [11, 12].

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The Content of Vitamins and Nutrients in Food Ration of Natives of the Republic of Sakha (Yakutia)

ABSTRACT

The assessment of content of vitamins and nutrients in a daily ration of natives of Yakutia is shown in this article. The analysis has revealed the low-grade macro and micronutrient content in the ration, especially of such elements as calcium (Ca) and magnesium (Mg), as well as the excess of phosphorus (P) and sodium (Na) in the daily food. The acute deficiency of vitamins B (B1, PP) and C is detected in the analysis of vitamin content of the ration.

Keywords: nutrition, daily ration, nutrients, vitamins.

INTRODUCTION

Nutrition of indigenous people of the North has undergone considerable changes for the last century, and it is not considered as traditional nowadays. For the last decades in the Republic of Sakha (Yakutia) there have been cardinal social and economic transformations which had impact on all aspects of life of indigenous people including nature of food. Qualitative nutritional status is not only the sufficient contents of basic macronutrients, but also vitamins, both macro - and microelements in a daily diet.

The Aim of the Research: to estimate the content of vitamins and mineral elements in a daily diet of the natives of Yakutia.

MATERIALS AND METHODS

Data of a daily ration of 268 rural natives of Yakutia (Yakuts, Evens, Evenks), aged from 30 to 50 years are studied. Actual food of the surveyed was studied by means of a method of daily food reproduction [3] by receiving data on the food taken within the last days with use of an album of foodstuff and dishes [2]. On the basis of the obtained data with the help of the tables "Chemical Composition of the Russian Foodstuff" a chemical composition of the daily ration was determined [6]. The balance of the ration was estimated in sizes of consumption of the main nutrients, energy, comparing them with provided in methodical instructions "A balanced diet. Norms of physiological needs for feedstuffs and energy for various groups of the population of the Russian Federation" (MU 2.3.1. 2432-08) [7].

At implementation of the statistical analysis an inspection on a normality of distribution of the studied quantitative indices was carried out according to Kolmogorov's test – Smirnova. Reliability of distinctions between average sizes was estimated by means of criterion of t of Student for independent selections, the probability of justice of a zero hypothesis was accepted at $p < 0,05$.

RESULTS OF THE RESEARCH

In earlier conducted researches in diets of inhabitants of Yakutia the insufficient amount of mineral substances, first of all, to is revealed, Ca, Mg, P, Fe [1,4,5,8,9]. In the analysis of the content of vitamins B an average daily diet it is shown (tab. 1) that consumption of vitamin A among men exceeded the recommended sizes twice. While intake of vitamin A with a diet at women by 1,3 times was lower than norm. The extremely poor receipt β -каротин with food – 61% lower than the recommended sizes in both studied groups is revealed. Average daily consumption of B1 vitamin in both studied groups was slightly lower than the recommended sizes. So, the content of B1 vitamin in a diet of women was lowered by 38,0%, and in a diet of men is 18,6% lower than the recommended consumption size. Receipt with food of B2 vitamin corresponded to the recommended sizes in both groups. The content of RR vitamin in a daily diet of men met standard, and in group of women was lowered by 24% of the recommended size. Despite high consumption of grain products, the content of vitamins of group B (B1, B2, PP) attracts attention. Perhaps, it is connected with prevalence in structure of food of the refined grain products. The extremely poor consumption of vitamin C with a diet in both studied groups is revealed. So, receipt with food of vitamin C among men for 60, 0% below the recommended norm, and at women – for 68,6%. It should be noted that in the studied groups the lowest consumption of fresh vegetables, fruit and berries is revealed.

The analysis of consumption of mineral substances in a daily diet of all surveyed showed that consumption almost analyzed macro - and microcells at men was higher than all, than at women ($p < 0,05$) (tab. 2). So, daily consumption of phosphorus among men exceeded value of norm by 2,1 times, among women – by 1,6 times. As for sodium consumption, its average daily receipt with a diet at men was 3,7 times higher, and among women – is 2,8 times higher than the recommended sizes. Insufficient average daily consumption of calcium and magnesium in diets, both women, and men is revealed. So, the average daily level of calcium in a diet was lower than norm for 29,0% at men and for 28,8% at women. Consumption of magnesium in a diet of men was below the recommended sizes for 13,5%, and among women – for 29,2%. Consumption of iron was sufficient among women, and at men exceeded the recommended norms by 2,3 times.



CONCLUSION

Assessment of contents macro - and microcells in a daily diet revealed the expressed insufficiency of such mineral substances as, calcium and magnesium, and the excess contents in the consumed diet of phosphorus and sodium that characterizes the actual food of the examined persons as unbalanced on micro and macroelement structure. The analysis of vitamin structure of a daily diet showed that insufficiency is combined and mentions vitamins of group B (B1, PP) and A. Otmechen an acute shortage of consumption of vitamin C both in group of men, and in group of women. It should be noted that among men higher consumption of vitamins A, B1, B2, PP was noted.

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Table 1

Average daily consumption of vitamins in diet of aboriginals of Yakutia

vitamin	male, n = 57	female, n = 211	The recommended sizes [#]
A, mg/days	1,83 ± 0,04*	0,58 ± 0,03	0,90
Carotinoids, mg/days	1,95 ± 0,06*	1,92 ± 0,03	5,00
B ₁ , mg/days	1,22 ± 0,06*	0,93 ± 0,03	1,50
B ₂ , mg/days	2,74 ± 0,22*	1,89 ± 0,05	1,80
PP, mg/days	23,22 ± 1,46*	15,20 ± 0,46	20,00
C, mg/days	36,01 ± 3,44*	28,26 ± 1,35	90,00

Note: # Norm of physiological needs for energy and feedstuffs for various groups of the population of the Russian Federation (MP 2.3.1.2432-08); * $p < 0,05$ in comparison with group of female

M.I. Tomskiy, S. Chinti, D.G. Tikhonov, K.S. Loskutova, E.A. Isakov

Brown Adipose Tissue and Extremely Cold Climate

ABSTRACT

In the article a case of verification of brown adipose tissue was described at a patient of 54 years old, a resident of the coldest city in the world Yakutsk. The brown adipose tissue was revealed in adipose tissue samples with para-aortic, perirenal, subclavian and perityroid areas. The abdominal fat was introduced by typical white adipose tissue.

Keywords: brown adipose tissue, white adipose tissue, cold climate, histology.

INTRODUCTION

It has been widely accepted that brown adipose tissue (BAT) can be functioned only in infant organisms. However, in 2009, “The new England journal of medicine” published three articles dedicated to activity of brown adipose tissue in adult humans. The articles clearly demonstrated the existence of BAT by a method of positron emission tomography with determination of ^{18}F - fluorodeoxyglucose assimilation and intravital biopsy with immunohistochemical determination of UCP 1 protein in biopsies [3 - 5].

Brown adipose tissue activates in specific areas of the fat when animals or humans are exposed to the cold [2]. A number of researchers have found indirect evidence of activity of BAT in inhabitants of regions with extremely cold climates [1, 6]. However, despite the many indirect signs of activation of brown adipose tissue in adult residents of regions with extremely cold climates, up to date, the fact was not confirmed by histology and morphology verification of BAT. We also did not find in the Medline and Web of Science histologically confirmed cases of describing the activity of BAT in the circumpolar residents of cold regions of the globe.

In this report, we describe the first case of histologically confirmed existence of a typical brown adipose tissue at a resident of Yakutsk, died of trauma.

Yakutsk is located in the northeast of the Russian Federation. Yakutsk is an absolute record-breaker for the minimum air temperature among the cities of the world. The average annual temperature in the city is about -10°S , and in February 5, 1891 the temperature 64.4°S has been fixed.

The patient R., male, 54 years old, height 168 cm, slim complexion, was born and lived in the city of Yakutsk, had no permanent job, for the last years worked in constructing buildings. Most of time he spent working outdoors and was affected by cold temperatures.

Samples were obtained from adipose tissue in the following areas: from subcutaneous fat of the abdominal wall, from the neck, from para-aortic, and left perirenal, subclavian and around-thyroid areas [7]. From these samples histological preparations were done by a conventional standard method (fixed with formaldehyde and embedded in paraffin) (Fig. 1-3). Staining with hematoxylin-eosin.

At microscopic examination typical brown adipose tissue clusters were observed histologically in the preparations of the para-aortic and both perirenal, and subclavian regions and around-thyroid regions. In preparations of subcutaneous fat and abdominal fat only typical unilocular fat white adipocytes were found. On Fig. 2 and 3 characteristic for brown adipose tissue, compared to the white adipose tissue, histological signs are observed. Thus, on Fig. 2 adipocytes are of smaller size, and at x200 magnification it is shown that they consist of many small vacuoles, while white adipose cell consists of one large fat vacuoles (Fig. 1). On Fig. 1 histological examination shows the presence of a typical white adipose tissue, where the adipocytes have in their cytoplasmic lipid droplets in one large vacuole, and Fig. 2 and 3 show the typical histological picture of brown adipose tissue with the presence of fat in the cytoplasm of cells in the plurality of lipid droplets as small vacuoles.

CONCLUSION

It should be noted that this message is the first evidence for the presence of the brown adipose tissue in the adults living in a very cold region.

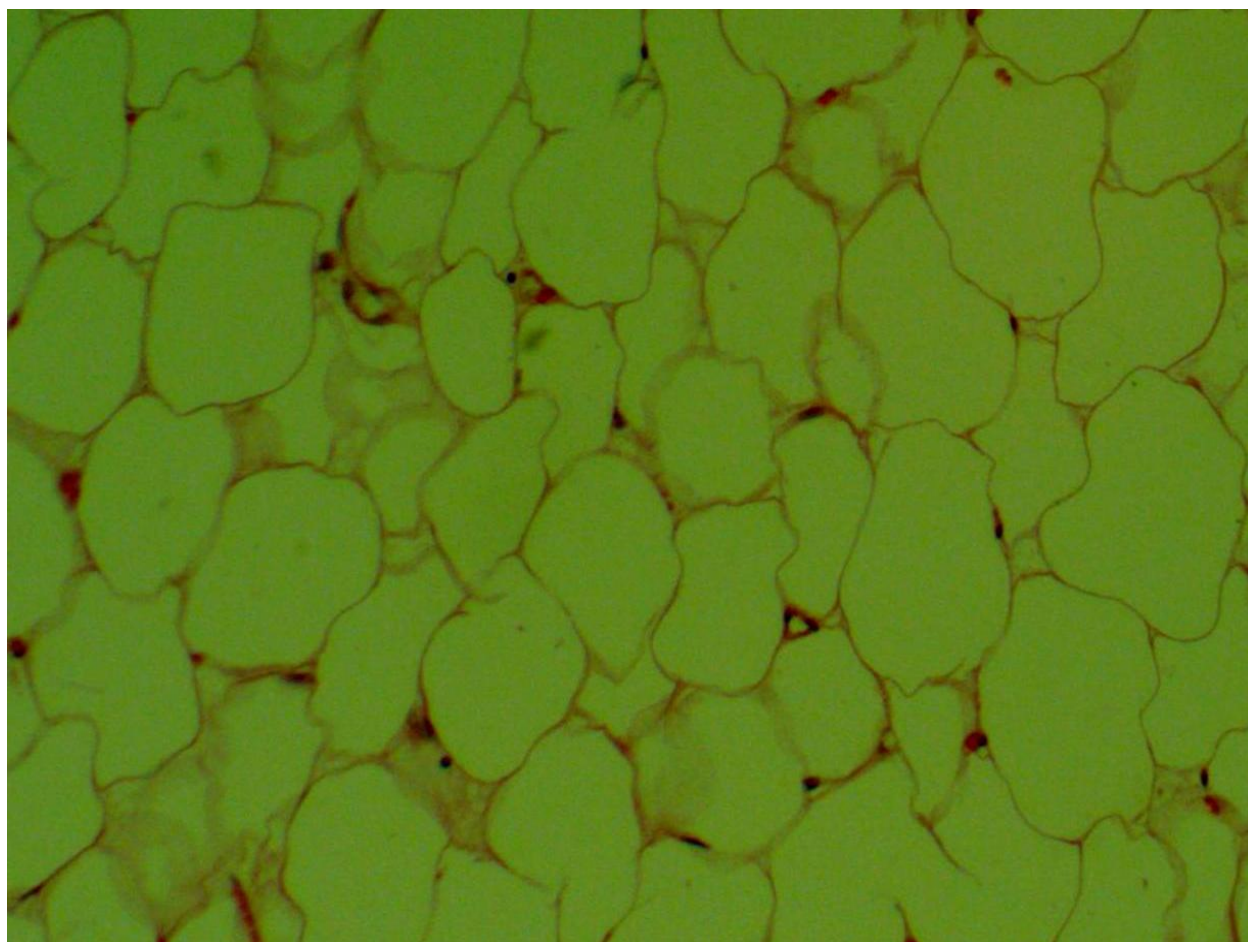


Fig. 1. Patient R., 54, a resident of Yakutsk. White adipose tissue of subcutaneous tissue. Staining with hematoxylin-eosin. Incr. x 100

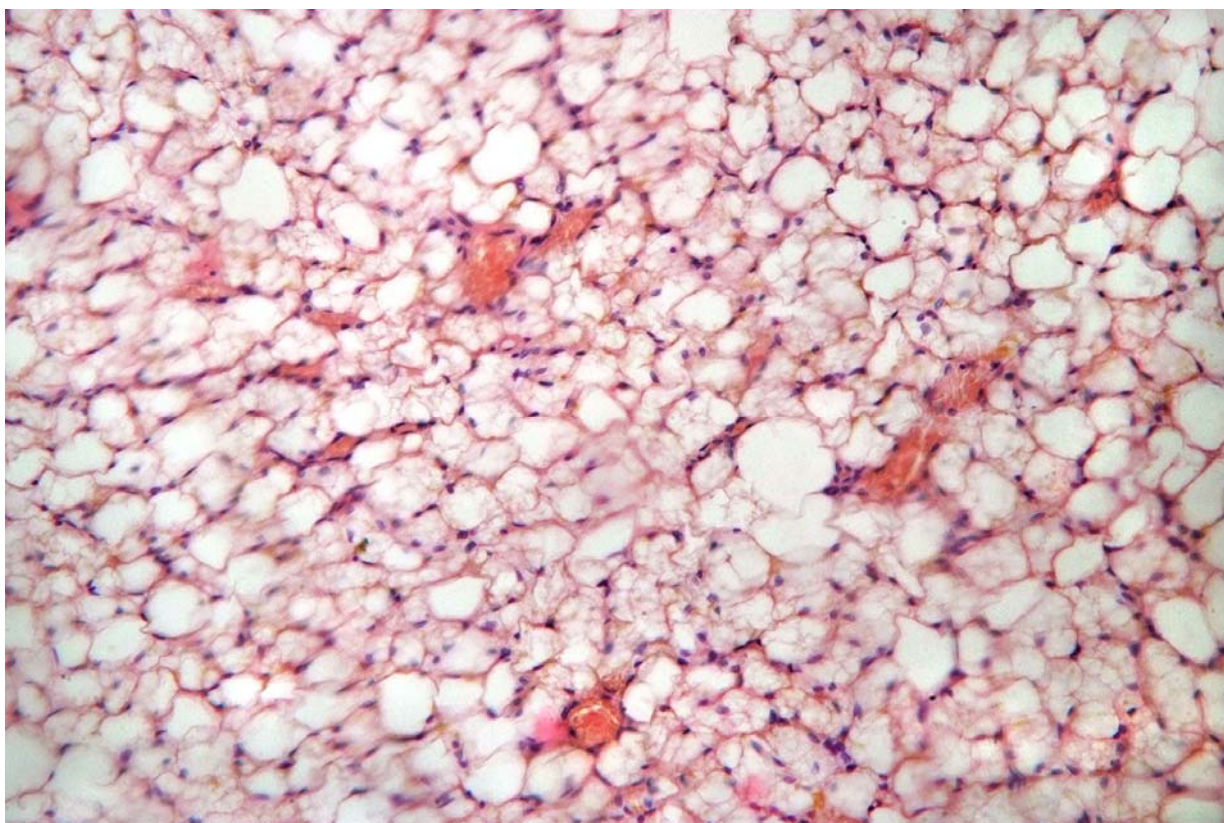


Fig. 2. Patient R., 54, a resident of Yakutsk. Brown adipose tissue of perirenal fat. Staining with hematoxylin-eosin. Incr. x 100

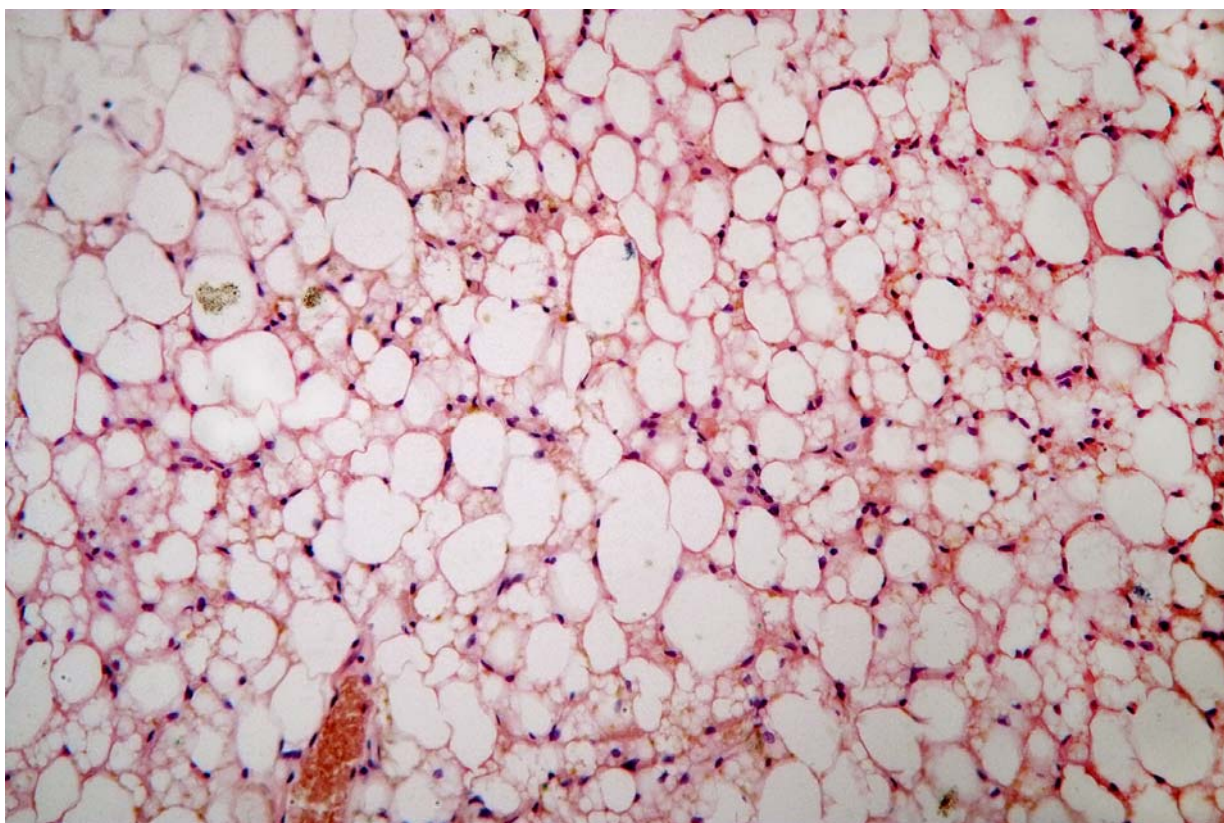


Fig. 3. Patient R., 54, a resident of Yakutsk. Brown adipose tissue from para-aortic tissue. Staining with hematoxylin-eosin. Incr. x 200

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Organic and Extraorganic Pancreatic Pseudocysts. The Clinical Course. An Experience and Results of Surgical Treatment

ABSTRACT

This article shows data of the results of surgical treatment of patients with intraorganic and extrapancreatic pseudocyst. According to the study the frequency of formation of extrapancreatic pseudocysts is significantly lower than its intraorganic localization. Extrapancreatic pseudocysts differ with scanty clinical presentation and less quantity of complications. X-ray computed tomography with intravenous bolus tracking is considered a 'gold' standard of the diagnostics of postnecrotic pseudocysts (especially extraorganic localization). Not complicated extrapancreatic postnecrotic pseudocysts, as usually do not require surgical correction and in complicated process a minimally invasive method of surgical intervention should be applied as the main method of the treatment.

Key words: pancreatic pseudocysts, surgical treatment.

INTRODUCTION

In spite of achievements of modern hi-tech medicine and accumulated practical experience in pancreatology, since present times many problems related to early diagnostics and adequate expected treatment of extraorganic and intraorganic extrapancreatic pseudocysts have not been solved, they being formed during pathomorphologic transformation on the different stages of acute destructive pancreatitis.

High prevalence rate of complications and lethality at different clinicopathological forms and in the different stages diseases, it being referred by authors in the research works, and also different variants of surgical treatment, including in a historical aspect, presumably, creates the situation of statistical unauthenticity [14]. Nevertheless, to a great extent it is caused by different terms of hospitalization from the moment of formation of pseudocyst, untimely or/and inadequate diagnostics, absence of single interpretation of pathological forms [1,4]. Such situation creates the necessity of searching new methods of diagnostics, treatment, and also improvement of existing principles and methods of conservative and surgical treatment of pancreatic pseudocysts [10,11,13].

The large variety of localizations, pathomorphology of cysts particularly a state of their wall, character of content, alterations of other departments of pancreas and contigu



ous organs does not allow simply to select the appropriate treatment [2,3,5,8,9]. However, it should be noted that to a great extent testimonies to operations and selecting of its concrete method are determined by localization, term depth and cyst, as well as by a type of developing complication [5,6,11].

In our work we tried to underline some steps in diagnostics, features of the clinical course and a therapeutic approach in revealing extraorgans (extrapancreatic) pseudocysts. It is characterized by the situation that for the last decade there have been considerable achievements in surgical pancreatology and revision of basic ideas about pathomorphologic processes at acute destructive pancreatitis and in development of his polymorphic complications, as well as few advanced studies sanctified to features of the clinical course and variants of complications in extrapancreatic pseudocysts.

MATERIALS AND METHODS

The presented work is based on the analysis of results of conservative and surgical treatment 497 patients with pancreonecrosis, hospitalized in surgical departments and the Center of ambulatory surgery of the Republican center of Emergency Medical Service of the Republic of Sakha (Yakutia) for period from 2010 to 2015.

The diagnosis 'pancreonecrosis' and its complications is verified on the basis of complex inspection including data of clinical, laboratory and instrumental methods of research, including the x-rayed computer tomography. At 384 (77,3%) patients included in the control group according to data of clinical, laboratory and instrumental methods of the research we revealed the development of widespread pancreonecrosis, at 113 (22,7%) the formation of restricted destructive process. As criteria of the formation of widespread pancreonecrosis [13], necrotizing alterations in more than one department of pancreas with the obligatory involvement of cellulose of different areas of retroperitoneum were revealed such as parapancreatic, paracolical, paranephric, small pelvis and/or cellulosis structures of abdominal region (mesentery of thin or thick bowel, small and large stuffing-box). At 53 (10,7%) patients the formation of postnecrotic pseudocysts is marked after 4 and more than weeks with initial diagnosis of sharp pancreatitis, here 17 (32,1%) patients had their extraorgan localization.

All patients were divided into 4 groups concerning to the periods of forming postnecrotics pseudocysts (PNPC). According to the following classification [7] the 1st group included patients with the formation of PNPC for 4-6 weeks since destructive pancreatitis had been diagnosed; the 2nd group comprised patients, which term of formation PNPC amounted 2-3

months from DP onset; the third group included patients, which term of forming PNPC amounted 6 months from DP onset and the fourth group, the term of forming of postnecrotics pseudocysts comprised 6-12 months from DP onset.

The primary estimation of severity of the general state and polyorganic insufficiency for PNPC patients was conducted at the reception of in-patient department and/or reanimation and intensive therapy departments and was based on clinical manifestations of the disease, primary indices of the laboratory and instrumental methods of research, and application of computer versions of calculation algorithms of integral systems-scales TFC [13], APACHE II [15], as well as complex estimation of a level of endogenous intoxication (determination of level and distribution of substances of low and middle molecular mass and oligopeptide (OP) in the different biological media of the organism with selection of 5 phases of endogenous intoxication (EI) and accordingly to the 4th categories of severity [8, 12].

Statistical treatment of the material is produced with the use of the statistical program "StatPlus 2007" for the operating system Microsoft Office 2007 with the calculation of averages ($M \pm m$). A certainty of distinctions (p) of two groups factor was determined on t - to the criterion of Student.

Results and discussion. All patients the researches included in the cohort were divided into two groups depending on localization of PNPC. So the first group was made by patients with intraorganic localization of PNPC at 36 (67,9%) patients. The second group was made by patients with extraorganic localization of PNPC at 17 (32,1%) patients (table. 1).

According to the results of our researches the complicated course of PNPC was revealed in 58,3 cases of 1th group and in 29,4 cases of the 2th group. We presented the complications of PNPC, being found out in the supervision of the 1st and 2nd groups of the research (Tab. 2).

In connection with developing complications of PNPC the operative treatment was conducted to 21 (58,3%) patients of 1th group of supervision : 2 (9,5%) patients were with I degree of severity, 14 (66,7%) patients with II degree of severity, 4 (19,0%) 1 (4,8%) patients with IV degree of severity (Table 3). Thus, at 15 (41,7%) patients of 1th group the reduction of liquid formation or its considerable reduction with jugulation was noted after conducting multicomponent conservative therapy, it excluding invasion interventional methods focused on pseudocyst liquidation.

Suppuration of cyst is educed at 9 (25,0%) patients (88,9%) patients with the period of formation of PNPC for 4-6 weeks, 11,1% patients with the period of forming for 2-3 months). 7 of them (77,8%) patients underwent transcutanical outward drainage of cyst cavity by ultrasound

supervision, at 2 patients (22,2%) laparoscopic complemented operations with the use of intermuscular short-scar incision using a universal surgical set "Mini-assistant". Only in one case the repeated operation was required in the volume of outward drainage of cyst cavity by Penrouse-Miculich's tampon with forming of omentobursostomia, as a result of detritus permanent obturation of drainage constructions. For this patient the complication was related to forming of outward pancreatogenical fistula that was closed independently as a result of conservative measures.

During supervisions at 3 (8,3%) patients PP was complicated by bleeding (all patients with the period of forming of PNPC for more than 6 weeks), here the surgical approach was determined by its intensity, blood loss volume, localization of cyst, severity of the state of the patient. Two types of operative intervention were conducted to the patients with bleeding: pancreatectomy together with a cyst and omentobursostomia, sewing of bleeding vessel and tight swabin of cyst cavity in case of grave condition of the patient. Pancreatectomy is executed 1 (33,3%) patient, omentobursostomia with tight swabin of cyst - 2 (66,7%) patients. It should be noted that at 1 patient, who underwent omentobursostomia with tight swabin and sewing of bleeding vessel, the repeated operation was implemented due to bleeding regression.

But one of the most threatening complication was perforation of pancreas pseudocyst at 5 (13,9%) patients (60 patients with the period of forming of PNPC for 4-6 weeks, 40 patients with the period of forming 2-3 months). The perforation of pseudocyst in a spare abdominal region was noted at 4 (80,0% patients, in pleura cavity at 1 (20,0%) patients. Perforation of cyst in the abdominal region with development of local peritonitis is marked at 3 (60,0%) patients. The drainage of the abdominal region and omental sac is produced all three patients with the use of intermuscular short scar incision. Surgical manual in the volume of outward drainage of cyst cavity and by drainage of abdominal region with the use of celiotomy access in case of occurring diffuse peritonitis was conducted at 1 (20,0%). At 1 (20,0%) patients the perforation of cyst is conducted in a pleura cavity. The treatment of such patient was conducted with active aspiration of pleura cavity contents. After stabilizing of the state the operative intervention was executed to him in the volume of distal pancreatectomy with a cyst.

We examined 4 (11,1%) patients with pancreas pseudocysts with complication due to development of mechanical icterus (75 patients with the period of forming PNPC for 4-6 weeks, 25 patients with the period of forming for 2-3 months). All cysts were localized in the head of pancreas, at 3 (75,0%) patients the cysts were "immature" [6] (forming period - 4-6 weeks). Patients with the "immature" pseudocysts of pancreas were operated with the use of minimally

invasive methodologies, including the cyst drainage by means of ultrasound investigation. At all patients slump of walls and obliteration of cyst cavity were noted. In this group the internal drainage was executed at 1 (25,0%) patient. Complications were noted at 2 (50,0%) patients: 1 case had outward pancreatic fistula after transcutaneous drainage, it being closed after conservative measures, and another case had subhepatic abscess on Kerschne after cystoduodenostomy. The patient was operated and recovered.

In the 2th group of supervision the operative treatment due developing complications of the disease was conducted at 5 (29,4%) patients: with I degree of severity at 1 (20%) patient, with II degree of severity at 3 (60%) patients, with III degree of severity at 1 (20%) patient (Table. 3). Thus at 12 (70,6%) patients, as well as in the 1th group of supervisions, after multicomponent conservative therapy reduction of liquid education or its considerable reduction is marked by regression of clinical manifestations.

Suppuration of cyst is educed at 2 (11,8%) patients, the localization of PNPC was a paranephric cellulose on the left (all patients with the period of forming PNPC of more than 6 weeks). All patients underwent the drainage of cavity of suppurated PNPC with the use of intermuscular short-scar incision.

Abdominal ischemic syndrome that complicated the course of PNPC of extraorganic localization was diagnosed at 2 (11,8%) patients (all patients with the period of forming PNPC of 4-6 weeks). In both cases PNPC was in the projection of paracolic cellulose on the left with driving back of mesostenium root (the size of cysts, as a rule was more than 5 cm in a diameter). The patients underwent the drainage of cysts by ultrasound investigation from lumbar access. For all patients the slump of walls and obliteration of cyst cavity was noted.

Regional portal hypertension was diagnosed at 1 patient of 5,9 cases (with the period of forming of PNPC for more than 6 months). In this clinical case PNPC was localized in the projection of omental sac with driving back of hepatoduodenalis copula lateralis and by compression of janitrix on 1/3 (based on data of selective angiography). The internal drainage of cyst is executed at patients with the use of intermuscular short-scar incision.

Apparently, we used the wide arsenal of operative interventions (Table. 4). On the whole draining operations prevailed in 1 and in 2 groups with the use of littleinvasion methodologies. It is necessary to mark that comparison of patients on the types of the executed operative interventions, in this case, had relative character, as forming of intraorganic pseudocysts, in many cases cause to radical interference (resection) or operations of internal catchment, in case of the well-shaped ("mature") wall of cyst. However, the data demonstrate the predominance of



minimally invasive interferences evidently at both in the 1st group and 2nd groups, being a healthy factor in improvement of quality of medicare and reduction of terms of hospitalization, and earlier renewal of workability of this category of patients.

CONCLUSION. During the study the frequency of forming of extrapancreatic cysts is noted to be considerably lower than their intraorganic localization amounting 35%. Extraorganic (extrapancreatics) pseudocysts differ with scanty clinical symptomatology and characterized by less complications in the period of the existence – 29,4%. The leading method of diagnostics of postnecrotics pseudocysts (to especially extraorgans localization) and for present tense there is the x-rayed computer tomography with the intravenous bolus contrasting. The Uncomplicated extrapancreatics postnecrotics pseudocysts, as a rule, do not require an operative correction, and at complicated their flow the method of choice must be one of methods of wide arsenal of littleinvasion surgery.

Table №1

Localization of postnecrotic pseudocysts

Area of localization	Amount of patients (N=53)	
	абс.	M±m
1th group (n=36)		
Head of pancreas	4	11,1±4,0
Isthmus of pancreas	3	8,3±3,5
Body of pancreas	11	30,6±5,9
Tail of pancreas	15	41,7±6,3
Plural localization	3	8,3±3,5
Total	36	100
2th group (n=17)		
Parapancreatic cellulose	4	23,5±5,4
Area of stuffing-box bag	3	17,6±4,9
Paracolic cellulose on the left	2	11,8±4,1
Paracolic cellulose on the right	5	29,4±5,8
Paranephral cellulose on the left	2	11,8±4,1
Region of small pelvis on the left	1	5,9±3,0
Total	17	100

* - authenticity of distinctions of 1th group in relation to 2th ($p < 0,05$).

Table №2

Complications of postnecrotical pseudocysts organ and extraorgans localizations

Type of complication and localization	Amount of patients (N=53)	
	aбс.	M±m
1th group (n=36)		
Suppuration	9	25,0±5,5
Perforation	3	8,3±3,5
Bleeding	5	13,9±4,4
Development of mechanical icterus	4	11,1±4,0
Total	21	58,3±6,3
2th group (n=17)		
Suppuration	2	11,8±4,1
Abdominal ischemic syndrome	2	11,8±4,1
Regional portal hypertension	1	5,8±3,0
Total	5	29,4±5,8

* - authenticity of distinctions of 1th group in relation to 2th ($p<0,05$).

Table №3

Structure and description of distribution of patients on weight of the state

Weight of the state			Amount of patients			
Not operated patients			Group 1 (n=36)		Group 2 (n=17)	
APACHE II (points)	TFC (points)	EI (phase)	aбс.	M±m	aбс.	M±m
to 10 (I category)	to 3	I	2	5,6±2,9	8	47,1±6,4
11-20 (II category)	4-7	II	12	33,3±6,0	4	23,5±5,4
21-30 (III category)	8-11	III	1	2,8±2,1	-	-
31 and < (IV category)	12 and >	IV-V	-	-	-	-
Operated patients			Group 1		Group 2	
to 10 (I category)	to 3	I	2	5,6±2,9	1	5,9±3,1
11-20 (II category)	4-7	II	14	38,8±6,2	3	17,6±4,9
21-30 (III category)	8-11	III	4	11,1±4,0	1	5,9±3,1
31 and < (IV category)	12 and >	IV-V	1	2,8±2,1	-	-

* - authenticity of distinctions of 1th group in relation to 2th ($p < 0,05$).

Table №4

Types of operations at treatment of the complicated postnecrotical pseudocysts

Types of operation	Group 1 (n=21)		Group 2 (n=5)	
	aбс.	M±m	aбс.	M±m
Outward catchment	18	85,7±4,5	4	80,0±5,1
- transcutnical under ultrasonic control	10	47,6±6,4	2	40,0±6,3
- laparoscopic complemented from miniaccess	2	9,5±3,8	-	-
Distal pancreatectomy	2	9,5±3,8	-	-
Omeobursostomy with tomponade	2	9,5±3,8	-	-
Minilaparotomy from intermuscular miniaccess	3	14,3±4,5	-	-
Laparotomy with an outward catchment	1	4,8±2,7	-	-
Internal laparotomy	1	4,8±2,7	1	20,0±5,1
Lumbotomy from intermuscular miniaccess	-	-	2	40,0±6,3

* - authenticity of distinctions of 1th group in relation to 2th ($p<0,05$).

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The dynamics of Incidence Rate of Ovary Cancer at Female Population of Primorskiy Krai (1992–2011)

ABSTRACT

The incidence of ovarian cancer among female population of Primorsky krai for the period 1992-2011 was analyzed. Ovarian cancer was detected to be the 8-th most common type of cancer, occurring more frequently among females of Vladivostok city than among females of Primorsky krai. The ovarian cancer incidence tends to increase over time. By 2017, the ovarian cancer incidence is expected to rise by 16,8–26,6% in Primorsky krai.

Keywords: ovarian cancer incidence, Primorsky krai, Vladivostok city

INTRODUCTION

Women's reproductive health is one of the most important problems of modern society. It is therefore not surprising that the problem of cancer of the female reproductive system is under close medical attention. Ovarian cancer is the most common cause of death among gynecologic malignancies [4]. Worldwide, approximately 225,5 thousands women are diagnosed with ovarian cancer annually, with an estimated 140,2 thousands cancer-related deaths. In the United States, approximately 22,3 thousands are estimated to be diagnosed with ovarian cancer annually and over 15,5 thousands will die of this disease. In Russia, the number of ovarian cancer cases and cancer-related deaths has been estimated to be around 13,1 and 7,8 thousands per year, respectively. Ovarian cancer is the 5-th most common cancer among women worldwide [1; 17] and the 7-th most (5,1%) frequent for incidence in the regions of Siberia and the Russian Far East [15]. The highest incidence rates of ovarian cancer are registered in industrialized countries, such as the USA and Western Europe (12,5 cases per 100000 population) except Japan. The incidence of ovarian cancer in Japan is 4,6 times lower than that observed in other developed countries [10].

The prognosis for ovarian cancer patients is poor. Over 70% of ovarian cancer patients are diagnosed with stage III or IV disease, and the percentage of patients with stage I disease is two times less than that of patients with cervical and endometrial cancers [2; 8].

In Russia, the median age of ovarian cancer patients ranges from 58,2 to 58,4 years [7], being 61,4 years in Tomsk region (Siberia) [9].

In recent years, the reported data have shown an increase in the ovarian cancer incidence rate by 6,5% and 5,1% [6; 14] and 8,5% [10]. One-year mortality rate have increased by 36,8% [3].

The etiology of ovarian cancer has many factors. Ovarian cancer risk is associated with a number of factors: inheritance, state of reproductive system, hormonal and anthropometric factors, exposure to harmful environmental substances and others [3]. About 15% of ovarian cancer cases are related with the exposure to various environmental factors including 5% with exposure to air pollution [16]. In the vicinity of industrial centers, under the influence of anthropogenic pollution, the biogeochemical provinces are formed, that are characterized by increased cancer incidence, including ovarian cancer [12; 15; 16]. In general, epidemiological studies indicate that ovarian cancer is geographically unevenly distributed [2; 5; 12].

Therefore, it is necessary to conduct epidemiological monitoring of ovarian cancer in cohorts of the population residing in different environments, particularly in Primorsky krai, which has its own climatic, geographical, medical- demographic, social and technological features, and Vladivostok, which is the biggest industrial center of Primorsky krai.

The aim is to analyze the incidence rates of ovarian cancer during the period 1992–2011 for the population of Vladivostok and Primorsky krai (with the exception of Vladivostok)

MATERIALS AND METHODS.

The study was based on cancer register data collected at the Primorsky Regional Cancer Center, and covered the period 1992–2011. A total of 3005 women with newly diagnosed ovarian cancer were registered in Primorsky Krai including 968 women from Vladivostok city.

The ovarian cancer incidence was compared between the female population of Vladivostok city and Primorsky krai (except Vladivostok city).

Ovarian cancer incidence was analyzed over the 20-year period using the crude incidence rates (CIR) and age-standardized rates (ASR) cases per 100000 population (‰00), adjusted by each year of diagnosis and by 4 five-year time periods: 1992–1996, 1997–2001, 2002–2006 and 2007–2011. Trends in the annual CIR and ASR were analyzed using the following linear equation:

$$\text{CIR} = AT + B; \text{ASR} = A_1T + B_1,$$

with T being the number of years since 1992 and A, B, A₁, B₁ the coefficients determined using the method of the least squares. Correlation between actual and calculating incidence rates was analyzed using correlation coefficients [11].

The component analysis was carried out in accordance with Health Ministry guidelines [5]. There were calculated the following coefficients: C_a – a component of crude incidence increase, associated with changes in age-sex structure, C_r – a component of incidence increase associated with changes in risk to develop disease at the same age-sex structure and C_c – a component of increase associated with a combination of changes in the age-sex structure and risk to develop disease.

Statistical analysis was carried out by methods of mathematical statistics, adopted in modern epidemiological studies and recommended by the Ministry of Health [5; 13]. The change was regarded as statistically significant if the p value was $p \leq 0,05$.

RESULTS AND DISCUSSION.

Analysis of ovarian cancer incidence for the population of Vladivostok city and Primorsky krai over the 20-year period showed no significant changes. Ovarian cancer is still the 8-th most common type of cancer, accounting for 4,6 to 5,0% of all cancer cases.

Fig.1 shows that females of Vladivostok city were more frequently diagnosed with ovarian cancer than females of Primorsky krai. The average CIR for ovarian cancer was higher by 14,3% in females of Vladivostok city ($15,2 \pm 1,0\text{‰00}$) compared to that observed in females of Primorsky krai ($13,3 \pm 0,6\text{‰00}$).

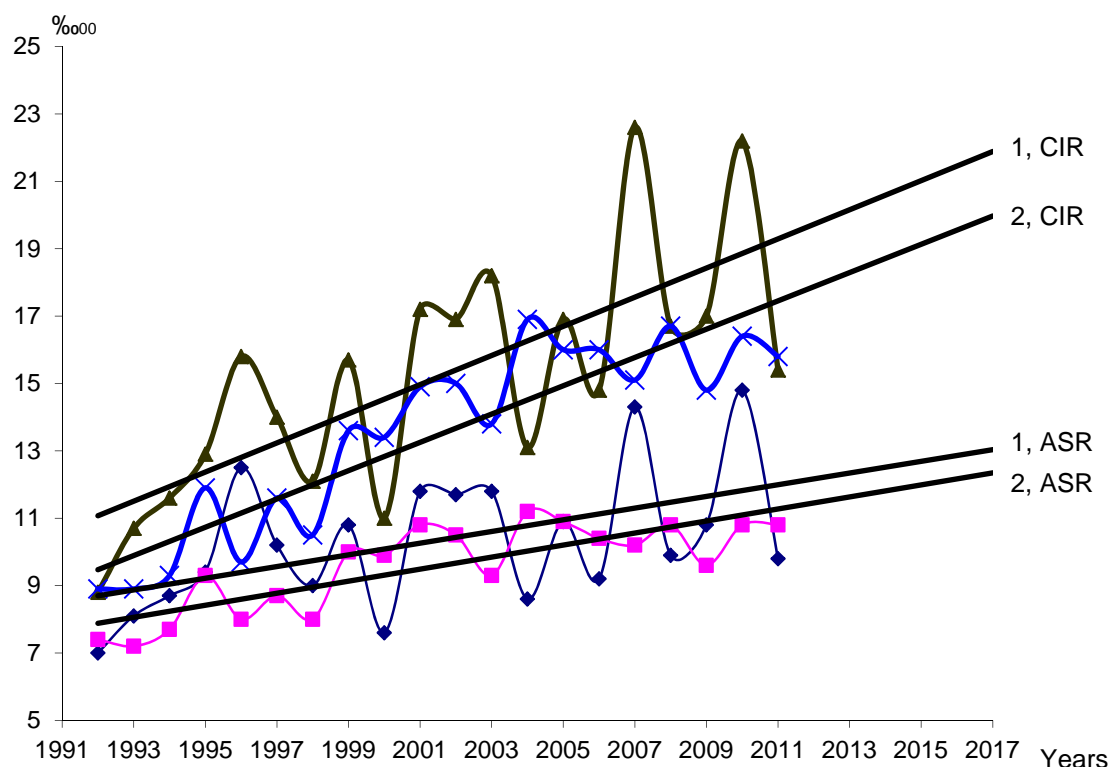


Fig. 1. Ovarian cancer incidence among female population of Vladivostok city (line 1) and Primorsky krai (line 2). The CIR and ASR of ovarian cancer per 100000 population

As shown in fig.1, the CIR is increasing over time. The increasing trends in both female populations of Vladivostok city (line 1) and Primorsky krai (line 2) are nearly parallel, although the CIR for ovarian cancer was higher in Vladivostok than in Primorsky krai.

Table 1 shows the average ovarian cancer incidence rates among females of Vladivostok city and Primorsky krai in various 5-year time periods. Between 1992–1996 and 2007–2011, the overall CIR for ovarian cancer increased by 56,7% in women of Vladivostok city and by 62,9% in women of Primorsky krai. During the period 1992–1996, a total of 592 women were diagnosed with ovarian cancer in Primorsky krai and 195 in Vladivostok city. Over the last 5-year time period (2007–2011), the number of new ovarian cancer cases had increased to 867 in Primorsky krai and to 304 in Vladivostok city.

Table 1

The CIR and ASR of ovarian cancer among the female population of Vladivostok city and Primorsky krai (except Vladivostok) for each 5-year time period from 1992 to 2011 and the predicted incidence rate by 2017

Female population	CIR in 5-yaer time periods				
	1992–1996	1997–2001	2002–2006	2007–2011	2017 year
Vladivostok	12,0±1,8	14,0±2,0	16,0±2,0	18,8±2,1	21,9±1,8
Primorsky krai	9,7±1,0	12,8±1,2	15,5±1,4	15,8±1,4	20,0±1,1
	ASR in 5-yaer time periods				
	1992–1996	1997–2001	2002–2006	2007–2011	2017 year
Vladivostok	9,1±1,3	9,9±1,3	10,6±1,3	11,9±1,4	13,0±1,6
Primorsky krai	7,9±0,8	9,4±0,8	10,4±0,9	10,5±0,9	12,4±0,9

The annual CIR for ovarian cancer among women of Vladivostok city with a statistical significance of $r=0,72$ and $p\leq 0,0001$ is described by a linear equation: $CIR(\%00)=0,43T+11,1$. Under conditions of maintaining the identified trends, the extrapolation of this equation allows making prediction of the CIR for ovarian cancer, at least until 2017, when the CIR is projected to increase by 16,8% compared to the period 2007–2011. In female population of Primorsky krai, the CIR is projected to increase by 26,6% in 2017 (table 1).

Ovarian cancer is much more common in older women, with incidence rates increasing with age. In Primorsky krai, including Vladivostok, there were no cases of ovarian cancer or only a few cases of this disease were registered among women under 30 years. In Vladivostok city, a sharp increase (a 1,9-fold increase per each decade) in ovarian cancer incidence was observed in women aged from 30 to 60 (table 2). For women aged 60 years and over, incidence rates remained stable or slightly increased.

Table 2

Ovarian cancer incidence among the female population of Vladivostok city and Primorsky krai by age (CIR per 100000 females) and the incidence increase (t) between 1992–1996 and between 2006–2011.

Age, years	Female population of Vladivostok city			Female population of Primorsky krai		
	1992–1996	2007–2011	t, %	1992–1996	2007–2011	t, %
30–39	6,6±3,3	8,2±3,9	24,2	5,4±1,9	9,7±2,8	79,6
40–49	12,5±4,7	18,8±5,7	50,4	13,6±3,1	20,2±4,2	48,5
50–59	32,1±8,1	35,5±7,8	10,6	23,4±4,7	31,6±5,0	35,0
60–69	27,3±9,5	42,9±10,0	57,1	30,5±6,1	31,4±6,3	2,9
70 and >	37,1±12,7	44,4±12,2	19,7	20,9±6,0	29,7±6,0	42,1
Median age	57,2±2,2	58,5±1,7	–	56,3±1,4	57,1±1,2	–

The age-specific ovarian cancer incidence rates in Primorsky krai were different from those observed in Vladivostok city. In Primorsky krai, over the first 5-year time period (between 1992 and 1996), the incidence of ovarian cancer gradually increased with the women's age up to 70 years, then the rate of increase dropped. Over the latest 5-year study period (between 2007 and 2011), the incidence rate increased with the women's age up to 60 years, then it remained stable.

The overall rise in the ovarian cancer incidence was observed in all age groups during the study period (table 2). In Vladivostok city, the highest incidence was recorded in the age groups 40 to 49 and 60 to 69. Among women of Primorsky krai, the highest increase was noted in the 30–49 age groups and in women aged 70 and over. Since the latter age groups were the largest in terms of the number of patients, age 60 and older for women of Vladivostok city and age over 50 for women of Primorsky Krai should be considered as the most significant risk factors for developing ovarian cancer by 2007–2011.

Table 2 also shows that CIR for ovarian cancer in women of Vladivostok city differed from that in women of Primorsky krai, but these differences were not statistically significant. The only significant difference in CIR for ovarian cancer between women of Vladivostok city and women of Primorsky krai was observed in the 70 plus age group. During the first and the latest 5-year study periods, the CIR of ovarian cancer was 1,8 and 1,5 times higher in women of Vladivostok city than in women of Primorsky krai, respectively.

Between 1992 and 2011, the median age of ovarian cancer patients increased by 0,8 years in Primorsky krai and by 1,3 years in Vladivostok, reaching the median age in Russian Federation in 2011 (58,4 years).

The component analysis data (table. 3) indicated that ovarian cancer incidence rates increased more slowly due to changes in the age-sex structure, than due to risk factors.

Table 3

The components of CIR rise among the population of Vladivostok city and Primorsky krai (except Vladivostok) between the time periods 1992–1996 and 2007–2011: C_o – the overall, C_a – related to changes in age-sex structure of the population, C_r – related to the risk of developing disease and C_c – related to the combined effect of age-sex structure of the population and risk to develop disease.

Population of Vladivostok				Population of Primorsky krai			
C_o , %	C_a , %	C_r , %	C_c , %	C_o , %	C_a , %	C_r , %	C_c , %
57,2	21,8	29,4	6,0	61,8	23,0	34,5	4,3

The ASR of ovarian cancer is steadily increasing over time (fig.1 and table 1). For women of Vladivostok city, the ASR was 1,3 times lower than the CIR between 1992 and 1996 and 1,6 times lower between 2007 and 2011. As a result, between 2007 and 2011, among the population of Vladivostok city, the ASR was higher by 10,1% than the average ASR in the RF in 2011($10,7 \pm 0,1(\%00)$), while among the population of Primorsky krai, the ASR was nearly equal to that in the RF. The fact that the CIR was higher than the ASR indicated that there was a standard deviation in the distribution of patients by age towards a greater number of elderly people, and the CIR increased mainly due to population aged 60–69 years (table. 2).

The line of trend in ASR with statistical significance of $p \leq 0,05$ ($r=0,50$) among women of Vladivostok city can be described by the equation:

$$ASR(\%00)=0,17T+8,7.$$

As shown in Fig 1, this line is smoother than CIR. By 2017, in Vladivostok, the ASR is expected to be higher by 9,2% compared to that registered in 2007–2011 (table. 1).

Conclusions. In Primorsky krai, ovarian cancer ranks as the 8-th most prevalent cancer among female population. Ovarian cancer occurs 14,3% times more frequently in women of Vladivostok city than in women of Primorsky krai (excepting Vladivostok), particular evident in women aged over 70, for which incidence is 1,5–1,8 times higher

Between 1992–1996 and 2007–2011, the overall CIR for ovarian cancer increased by 62,9% in women of Primorsky krai and by 56,9% in women of Vladivostok. The overall rise was related to a greater extent to changes in the risk of developing disease and to a lesser extent to the changes in age-sex structure. The highest incidence was observed for the 30–49 age group among women of Primorsky krai and for the 40–49 and 60–69 age groups among women of Vladivostok city.



In 2007–2011 years the ASR in women of Vladivostok city was 10,1% higher than the average for the RF in 2011, while it was similar to that in the RF among the rest of the female population of Primorsky krai. The crude incidence rate of ovarian cancer in Vladivostok city is expected to rise by 16,8% by 2017 compared to the period 2007–2011, and it is expected to be 21,5% higher than that in the RF in 2011.

Epidemiologic analysis of ovarian cancer among the female population of Vladivostok city dictates the necessity of ovarian cancer screening and risk factor identification, as well as the development of molecular and biological markers for early detection of cancers, including ovarian cancer.

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Features of Suicide Behaviour Among the Population of Yakutsk

ABSTRACT

The analysis (para-) suicide behavior among population of Yakutsk city from 2010 to 2013 is carried out. Social and clinical characteristics of incomplete suicide cases are determined. The most widespread model of suicidal behavior among the people addressed for medical care is established, as well as basic principles of preventive measures are elaborated.

Keywords: suicide behavior, alcoholic intoxication, social status, urban population.

INTRODUCTION

Every year the problem of suicide behaviour is getting more and more global character. Today in the world according to data of WHO, more people are affected by suicide as compared with all taken conflicts. Suicides with their level and dynamics are considered one of the major indicators of a social, economic, political situation and its changes, as well as contain information on well-being or trouble of society [2,4].

Nowadays the Republic of Sakha (Yakutia) remains the region with high incidence rate of suicides though for last decade decrease in the given indicator has been marked. According to the Federal Agency of the state statistics the level of suicides in Yakutia for 2013 has amounted to 35,7 on 100 thousand population (4,1 % from all cases of death rate for 2013). By existing position, unfavorable territories have indicators of suicide higher 20 per 100 thousand population. Besides high indicators of death rate from suicide, an indisputable fact can be influence of ethnocultural factor on dynamics of suicides in the republic. So, during the last years all over the Russian Federation the leading regions by quantity of suicides are ethnic republics (Altai, Tyva, Buryatiya, Yakutia), these indices bearing witness to variety of reasons, beginning from the religious factor, ending up to ethnopsychological features of crisis affection, connected with ethnocultural features of regions [3,5].

The aim of the research is to carry out the analysis of (para-) suicide behavior cases among the people who live in Yakutsk from 2010 for 2013 and to reveal the most widespread models of autoaggression among the persons who addressed for medical care in the Yakut republican psychoneurological dispensary.

RESULTS AND DISCUSSION

In total 289 cases of uncomplete suicide have been analysed. Of them suicide attempt has been at 147 (50,8 %) men and 142 (49,2 %) women. Thus, differences concerning to any sexual

signs are not found out. This index proves to be true by last literary data on suicide behaviour [2,6]. Out of 289 cases 59 citizens have been refused for the further hospitalization, though all addressed were examined by a doctor - psychiatrist. More often refusal in hospitalization has been connected with refusal of a person from the psychiatric help or critical somatic condition expressed by alcoholic intoxication. Further such patients either were delivered to somatic hospitals or narcologic clinics or police offices for sobering. More often citizens with uncomplete suicide were delivered by EMS or policemen.

The analysis on the age periods has shown non-uniformity of suicide activity among different age groups (picture 1). The most active peak of suicide behaviour is noted in the age group from 19 - 23 years. For the rest groups, with every 5 years the decrease suicide level has been noted. Such dynamics is explained by features of social functioning and psychological reaction of a person during the various age periods. On this basis, the age period from 19-23 years is the most difficult for the young man as during this period there is a choice of the basic vital reference points (professions, marital status etc.), and emotional strong-willed sphere and personal characteristics have not reached yet the full harmonious development. It often enough leads to disadaptation in the modern environment, making sometimes too high demands to possibility of successful existence. Further with process of growing up the person becomes steadier to various influences of the social environment, accordingly the quantity of suicides in more mature age groups is considerably lower [6]. Some active suicide behaviour also occurs during the retired period when a person already faces ageing crisis.

When studying an educational level of suicidents, the majority of them appeared to have a lower level of erudition. So, 64,7 % have only school education, and higher education - 10,3 % (30 persons). Hence, the level and quality of formation also influences on dynamics of suicides among the population. More educated has a higher social status and accordingly is satisfied by the vital position. This law proves to be true by many researches [2].

In the analysis of marital status we revealed that suicide activity is close to citizens who do not have families (51,2 %) and divorced (11,7 %). Married people rarely come to suicide actions (26,2 %) though the majority of researches point out presence of children to be the most statistically significant antisuicide factor. More frequently uncomplete suicide is made by jobless citizens (46,7 %). The factor mentioned is natural, as really a person who does not have constant work and earnings, is exposed to emotional pressure, suffers from depressions, so these factors lead to the expressed adjustment disorder. On the second place there are invalids (20 %) on

frequency rate of suicides (more often on mental disease) who suffer from permanent adjustment disorder (picture 2).

There were 157 persons (54,2 %) initially addressed for medical aid, the other 139 persons have already been addressed earlier for the psychiatric help. For the first time 180 persons tried to make a suicide accounting 62,2 %, and repeatedly - 109 persons (37,8 %).

According to nosologic structure there were 124 suicidents (42,9 %), who were registered at a doctor - psychiatrist (Tabl.2). Most frequently among the citizens who have addressed with suicide behavior, psychopathy-like state in alcoholic intoxication (30,7 %) was diagnosed, this indicator being third of all cases that coincided with the data of some Russian authors [1]. In general it is possible to note the highest frequency of alcoholic intoxication. Among all cases the given indicator has amounted to 42,2 % (122 persons), and alcoholic abuse as comorbid pathology was noted at 102 persons (35,2 %). On the second place on frequency of suicides the patients with schizophrenic spectrum (paranoidal schizophrenia, schizoaffective frustration, schizotypal frustration, acute psychoses) were revealed, on the third there were patients with short-term depressive reaction to a situation. Patients with "a pure" affective pathology suffering from endogenous depressions made less suicide attempts (10,7 %), than patients with personality disorder and schizophrenic frustration. Thus, it is possible to assume that endogenous depression within the limits of circular affective psychoses is less «causing a suicide», than depressive frustration within the limits of reactive response. It would be also desirable to notice that the patients suffering from endogenous psychoses more often made a suicide in sober state [4]. For example, out of 45 persons suffering from schizophrenic spectrum there were only 2 cases with ascertained alcoholic intoxication.

When studying precipitating agents, we revealed that the interpersonal intrafamily conflict was noted most often. So, the given factor was accurately in 119 case (41,7 %). On the second place was the depression - 43 cases (14,8 %), on the third place on frequency there were hallucinatory experiences - 25 cases (8,6 %), and hallucinosis in this case had imperative, mandative character and was accompanied by the expressed alarm and fear. The classical example for a suicide of such model is alcoholic hallucinosis.

Most often suicide was noted during winter time (28,7 %), and rarely during the autumn period (21,1 %). No considerable difference in frequency of suicide attempts depending on a season in the given research was revealed, though it is possible to assume that in autumn - winter time it being more suicides noted, than in spring - the summer period.

The basic way of uncomplete suicide in the given research is the poisoning (41,8 % or 121 cases), and in most cases this is drug poisoning. Less often patients use the household chemical goods, the most popular of which is acetic acid (9 cases or 3,1 %). In general, cases of poisoning with acetic acid are very heavy in clinical aspect and in further forecast. Many of such patients do not come across with doctors - psychiatrists because die in reanimation departments because of severity of the somatic condition. Almost all patients registered with the diagnosis of schizophrenia, also have para-suicide action through drug poisoning. But in this case often enough such patients use psychotropic preparations, such as clozapin ("Azaleptin", "Leponeks"), being a strong sedative preparation. The persons who are not registered in YRPND, more often as "poison" use tablets drotaverin ("No-shpa"), aspirin, reducing pressure preparations etc. On the second place on frequency suicides through bleeding are noted (cutting of veins on wrists of hands) amounting 23,8 % (69 cases). On the third place on frequency suicides through suffocation - 47 cases (16,2 %) have. Rare cases of falling from height - 16 cases (5,5 %), a knife wound - 19 (6,5 %), a gunshot wound - 3 (1 %). A small amount of cases with use cold or fire-arms is connected first of all with fatality of such attempts which in most cases is fatal.

Thus, more often uncomplete suicide is made by young citizens with a low educational level (frequently 10 classes of education), absence of constant working place, suffering alcoholic abuse. Suicide from alcoholic intoxication after the interpersonal conflict (more often between spouses) by taking medicines which are available in a house first-aid set more often has bright demonstrative character with brutal threats, psychomotor excitation.

Taking into account the basic model of uncomplete suicide, the preventive work on decreasing the level of suicides should carry mostly socially - focused character, instead of medical. First of all, starting with a school stage, where powerful psychological monitoring, and an expert should be applied - the psychologist should be competent and acquainted with some medical aspects of suicide behaviour. In this stage risk groups where the schoolpupils who have shown deviant, autoaggressive, antisocial and addictive behaviour should be registered. Further this database should be accessible for psychologists, social workers working in other educational institutions. Certainly, timely employment, and also preventive work of narcologists under the prevention of development of various dependences has an important value. Within the limits of rendering of rehabilitation work with the citizens who have made suicide, the timely psychotherapeutic help first of all should be rendered. Now in Yakutia there is no specialised crisis department of round-the-clock stay where there is medical and psychotherapeutic help to



such contingent that appreciably deprives of rehabilitation potential and assumes formation of suicide relapse in the future.

Conclusions: 1. Suicide activity sharply increases in the age of 19-23 years. Further with each fifth year the given indicator decreases

2. More often uncomplete suicide is made by the citizens having a low educational level, single and jobless. About third people who made suicide suffer from alcoholic abuse. Suicide in half of cases is made in alcoholic state.

3. The most popular way of attempting suicide is the drug poisoning. More often the tablets containing drotaverin («No - shpa») are used.

4. Because suicides in a greater degree are considered to be a social problem, preventive and rehabilitation work should have a social character, instead of medical one.

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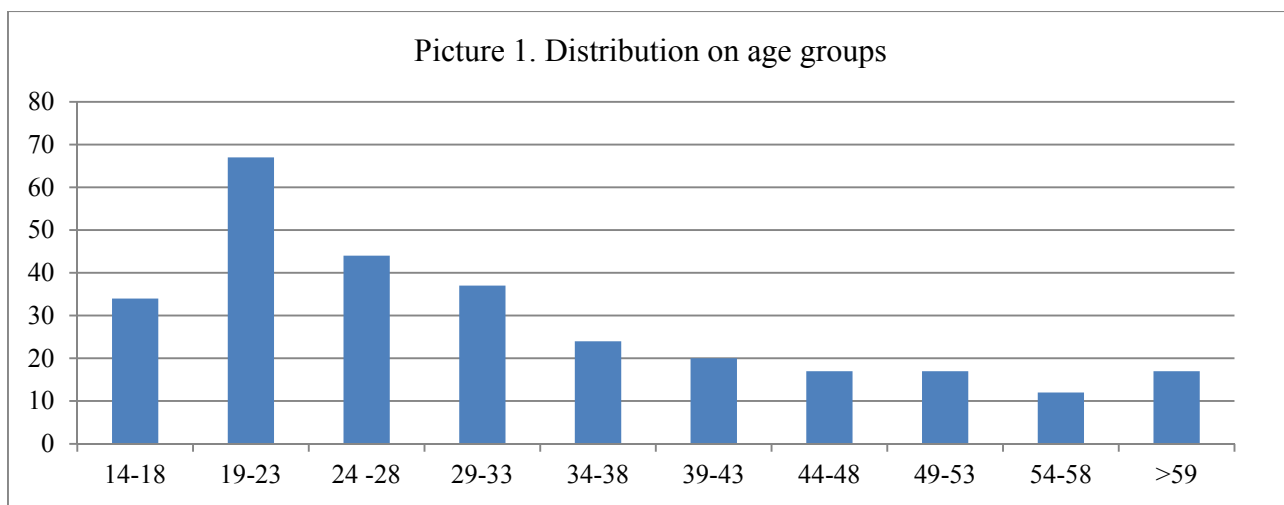
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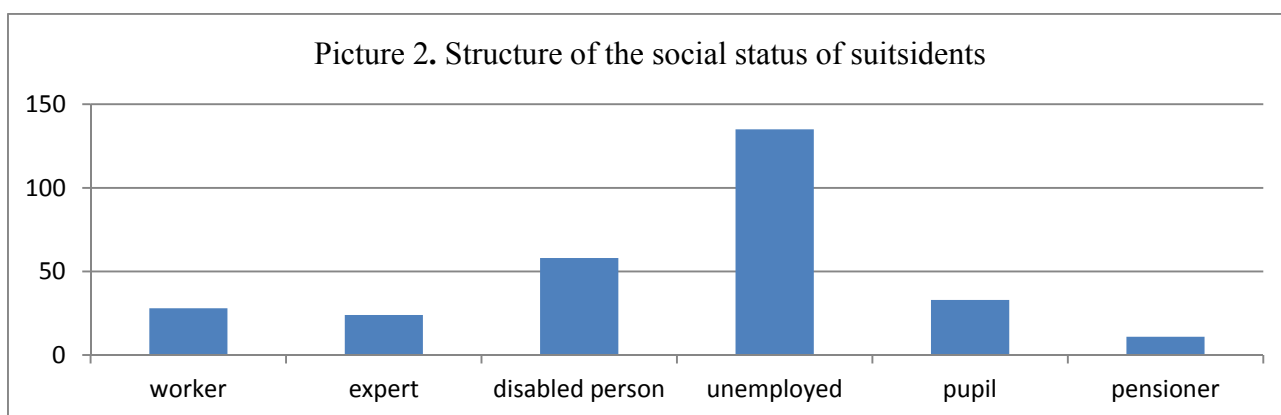


Table 1. The structure of diseases of people with not complete suicide

№	Illness	Abs.	%
1.	Schizophrenia	45	15,5
2.	Depressive frustration	31	10,7
3.	Frustration of the personality	34	11,7
4.	Intellectual backwardness	10	3,4
5.	Dementia	9	3,1
6.	Depressive reaction to a situation	38	13,1
7.	Disorder of adaptation	2	0,6
8.	Violation of behavior in alcoholic intoxication	89	30,7
9.	Epilepsy	7	2,4
10.	Violation of behavior	17	5,8
11.	Alcoholic psychoses	5	1,7
12.	Obsessive – fobia frustration	2	0,6

Yarbekov R.R., Nazarov A.A.

The Role of Hyperglycemia in the Perioperative Period in Carrying out Aortocoronary Shunting

ABSTRACT

In this article we presented pathophysiological features of hyperglycemia and its negative effects on the cardiovascular system, the ways to achieve optimal perioperative glycemic control, as well as the results of studies aimed to determine the optimal level of blood glucose for preventing postoperative complications and achieving optimal clinical results.

Keywords: diabetes mellitus, hyperglycemia, coronary artery bypass grafting.

The prevalence of diabetes mellitus (DM) in patients with coronary artery disease contributes to their increasing among the candidates for myocardial revascularization. According to various authors, from 30 to 40% diabetic patients in need for surgical treatment coronary artery disease (13). However, the results of the study suggest that the results of coronary artery bypass grafting (CABG) in patients with DM, in General, worse than in other groups of patients without diabetes (3,8). Revealed that among patients with diabetes has increased postoperative mortality increase in the frequency of the number of postoperative complications (infectious, neurological, renal) (19, 25, 28), which in turn significantly increases their hospital stay, and, consequently, the cost of their medical care (9). Recently, control of blood glucose levels during CABG surgery and other cardiac surgery becomes the object of intense study. According to most researchers, hyperglycemia that arises in the postoperative period is associated with increased mortality and morbidity in the postoperative period. The undeniable fact is recognized the need for careful monitoring of intraoperative blood glucose levels in order to correct the violation and prevent the adverse effects of hyperglycemia on the cardiovascular system.

Influence of hyperglycemia on the cardiovascular system.

To understand and assess the negative influence hyperglycemia the cardiovascular system is necessary to allocate some points. The energy substrate for no ischemic myocardium is free fatty acids. During ischemia metabolism of fatty acids is disturbed and increased their concentration, which adversely affects the myocardium in the form of increased oxygen demand, reduced contractility and occurrence of arrhythmias, and also increase the concentration of



oxygen free radicals, which in turn leads to endothelial dysfunction (26). Elevated levels of free fatty acids, also impairs the metabolism of glucose, which is the main substrate myocardial energy during episodes of ischemia. The transition from the oxidative metabolism of fatty acid oxidation of carbohydrates is a defensive reaction, as it allows more efficient use of myocardial oxygen under conditions of ischemia to produce ATP necessary for the normal functioning of the transport system channels of the cell membrane and prevent cell death. In diabetic patients disturbed glucose transport into the myocardium. Accordingly, the disadvantage is realized in ischemia substrate for ATP generation and increased levels of serum glucose [34]. Hyperglycemia leads to the formation of glycosylation end products and their receptors on cell membranes. Receptors glycosylation end products cause amplification of the inflammatory response by activating three proinflammatory transcription factors (nuclear factor-activating protein-1, epidermal growth factor receptors, which under normal conditions is suppressed endogenous insulin [38]. Hyperglycemia directly influences the processes responsible for changes in endothelial function, inflammation, and development oxidative stress in due to the alteration of the polyol pathway glucose's metabolism and increase synthesis diacylglycerol, which activates protein kinase C [14]. Endothelial dysfunction is associated with reduced nitric oxide activity and increased production of superoxide radicals. These changes are characteristic of diabetic changes in the internal mammary artery, as well as conduits for autovenous [22]. Ultimately, a result of vascular oxidative stress, inflammatory response is amplified, which contributes to thrombosis, plaque rupture, and inhibition of platelet function [29]. Accordingly, the above listed pathological reactions in patients with diabetes help to reduce permeability conduits return ischemic events and the need for repeat revascularization of the myocardium. Insulin levels the activating effect of hyperglycemia on the processes of vascular oxidative stress by increasing myocardial glucose uptake, reduces the inflammatory response and reduces the activity of cell apoptosis. Insulin is a catalyst myocardial glucose metabolism by stimulating glucose transport process in myocytes, thereby reducing the release of free fatty acids, and indirectly through activation of pyruvate dehydrogenase enhances aerobic metabolism. Also, insulin acts as an anti-inflammatory agent inhibiting proinflammatory transcription factors, nuclear factor kappa B, early growth response factor-1 activating protein-1 and reduces the activity of inflammatory mediators such as - IL-6, tumor necrosis factor - alpha, intercellular adhesion molecule 1 and E-selectin [16, 20]. Under the action of insulin leads to regulation of nitrogen metabolism, namely system «L-Arginine / Nitric Oxide," which leads to vasodilation, improvement of vascular endothelial functions and platelet function by inhibiting platelet



aggregation inhibitor, increased synthesis of prostacyclin. Also, a suppression of apoptosis of cells by increasing levels of nitric oxide [12]. Clinical studies have shown that insulin lowers the level of free fatty acids after bypass surgery improve aerobic metabolism when added in cardioplegic solution reduces the concentration of active oxygen species, adhesion molecules, and C - reactive protein [32, 35].

Hyperglycemia as a risk factor for developing complications in the perioperative period of aortocoronary shunting.

Several studies have demonstrated that hyperglycemia is the reason for the increase in morbidity and mortality in all patients undergoing CABG, without dependence from presence of diabetes. Thus, Donte T. et al. in the analysis of clinical outcomes patients undergoing 6280 cardiac surgery found that patients with high peak levels of blood glucose (360 mg /dL) during coronary artery bypass surgery had the highest rates of morbidity and mortality independently of the presence of diabetes [5]. Fish L. et al. found the following pattern - with an increase in blood glucose levels in the postoperative period (more than 250 mg/dL) in 10 times increased risk of various complications [10]. Similar conclusions were reached in other studies [15, 36]. Henderson et al., concluded that in patients with impaired fasting glucose annual mortality rate doubles after suffering a coronary artery bypass grafting [11]. Thus, these studies convincingly show that, regardless of the presence of diabetes, with an increase in blood glucose levels in the perioperative period of CABG associated increase in morbidity and mortality.

Glycemic control during perioperative period.

Glycemic control in the cardiac surgical patient is best achieved with strategies that are instituted in the preoperative period. All patients should have a hemoglobin A1c (HbA1c) drawn prior to surgery. The HbA1c is an indication of glycemic control in the 6–8 weeks prior to surgery. Adequate glycemic control is associated with an HbA1c < 7% [37]. In general, oral hyperglycemic medication should not be taken in the 12 hours prior to surgery. Patients who are taking insulin and who are admitted on the day of surgery should continue their basal insulin dose and hold their nutritional insulin. Intravenous insulin is the preferred method of insulin delivery to achieve rapid and effective glycemic control in hospitalized patients who are hyperglycemic prior to surgery [11]. During surgery, it is important to realize that insulin resistance increases but then rapidly decreases in the postoperative period. This results in an intraoperative rise in insulin requirements followed by a rapid fall in the immediate postoperative period. This is due to hypothermia, the increased glucose load associated with cardioplegia delivery, the glucose used to prime the cardiopulmonary bypass circuit, and the need for

inotropic support. Following discontinuation of cardiopulmonary bypass, when these factors are no longer present, insulin requirements decrease rapidly and if unrecognized, severe hypoglycemia can result (27). Therefore, it is necessary to check glucose levels prior to leaving the operating room and make the appropriate reduction in insulin delivery. Glucose levels should be monitored every 30–60 minutes in the operating room, and as often as every 15 minutes during periods of rapid fluctuation, such as during cardioplegic infusions and systemic cooling and rewarming. In the ICU, all patients should have serum glucose values ≤ 180 mg/dL as recommended by the STS guidelines (23). Patients who require ≥ 3 days in the ICU because of ventilatory dependency, the need for inotropes, intraaortic balloon pump or left ventricular assist device support, antiarrhythmics, dialysis, or continuous venovenous hemofiltration should receive continuous insulin infusions to keep blood glucose < 150 mg/dL regardless of their diabetic status.

The following are the current recommendations of the Society of Thoracic Surgery regarding blood glucose management during adult cardiac surgery [23].

- (I) All patients with diabetes undergoing cardiac surgical procedures should receive an insulin infusion in the operating room and for at least 24 hours postoperatively to maintain serum glucose levels < 180 mg/dL (Class I; Level of Evidence B).
- (II) An HbA1c level should be obtained prior to surgery in patients with diabetes, and those patients at risk for postoperative hyperglycemia to characterize the level of postoperative glycemic control (Class I; Level of Evidence C).
- (III) Glucose levels > 180 mg/dL that occur in patients without diabetes only during cardiopulmonary bypass may be treated initially with a single intermittent dose of i.v. insulin as long as the levels remain < 180 mg/dL. However, in those patients with persistently elevated glucose (> 180 mg/dL) after cardiopulmonary bypass, a continuous insulin drip should be instituted (Class I; Level of Evidence B).
- (IV) Patients with and without diabetes with persistently elevated serum glucose (> 180 mg/dL) should receive i.v. insulin infusions to maintain serum glucose < 180 mg/dL for the duration of their ICU care (Class I; Level of Evidence A).
- (V) All patients who require ≥ 3 days in the ICU because of ventilatory dependency requiring the need for inotropes, intraaortic balloon pump or left ventricular assist support, antiarrhythmics, dialysis, or continuous venovenous hemofiltration should have a continuous insulin infusion to keep blood glucose ≤ 150 mg/dL, regardless of their diabetic status (Class I; Level of Evidence B).

In order to avoid wide fluctuations in glucose levels, it is imperative that they be frequently monitored in the ICU. (Fig.1). The common practice of obtaining hourly glucose values until stable targeted blood glucose levels have been achieved [33]. Most patients have either an arterial or central venous monitoring line that allows for painless blood sampling. When there is anticipation of an inotrope or a dextrose solution causing rapid hyperglycemia, glucose values may be obtained every 30 minutes so that the target glucose level can be maintained.

Unfortunately, the accuracy of most hand-held glucose meters is far from optimal [7]. There is an accepted variance between meter readings and central laboratory results (allowed to be up to 20% by FDA regulations), which can potentially lead to inappropriate therapy [17]. Many patient factors are known to affect the accuracy of the POC testing including pH changes, oxygenation status, and low hematocrit [17]. Given these factors, all patients in the ICU have blood glucose levels determined by the central laboratory every 2 to 4 hours in the early postoperative period, and twice daily for up to 2 days. All glucose levels <70 mg/dL or >300 mg/dL are verified with blood samples sent to the central laboratory (Figure 1).

Transitioning the patient to SC insulin therapy is the most difficult of all the perioperative stages in terms of reliably maintaining adequate glycemic control (25):

- (1) A stable intravenous insulin infusion rate is maintained for at least 4 hours in the fasting state.
- (2) The patient is extubated and is off pressor agents.
- (3) The patient is ready to receive oral, enteral, or parenteral nutrition.

According to clinical guidelines Society of Thoracic Surgeons and the American Association of Clinical Endocrinology for the period of diabetic patients in the ward must be committed to maintaining optimal blood glucose:

- (1) A target blood glucose level <180 mg/dL should be achieved in the postprandial state.
- (2) A target blood glucose level between 100 and 140mg/dL should be achieved in the fasting and premeal states after transfer to the floor. The more effective way to achieve control of blood glucose levels is a combination of basal insulin "by the hour" and bolus insulin short-acting. Titration is carried out based on the diet and blood plasma glucose levels of the patient.
- (3) It is necessary to inform the patient that if you can not eat a meal injection of short-acting insulin should be skipped. However, injection of long-acting insulin preparations skip forbidden irrespective of the glucose concentration (even when normal) or skipping meals.

Often the main goal of restarting home oral agents is to ensure tolerability and safety in a patient who has achieved good control in the hospital postoperatively, is medically stable, and is

expected to require at least another day in hospital. Sulfonylureas (glipizide, glyburide, and glimepiride) and short-acting insulin secretagogues (repaglinide, nateglinide) should be started slowly and based on the patient's appetite. Metformin should not be restarted until the patient is documented to have normal renal function. Based on the data presented, it is now accepted that glycemic control improves short- and long-term outcomes in CABG patients with diabetes mellitus and those nondiabetics who exhibit perioperative hyperglycemia. However, the optimal target for serum glucose levels in the perioperative period is unknown. All studies have shown that maintaining serum glucose levels <180 mg/dL reduces morbidity and mortality, the effects of more aggressive control on clinical outcomes are less clearly defined. In order to determine the effects of more aggressive glycemic control in diabetic patients during CABG surgery, Lazar and coworkers prospectively randomized patients to either an aggressive (90–120 mg/dL) or moderate (120–180 mg/dL) protocol [114]. There was no difference in the incidence of a 30-day mortality, myocardial infarction, neurological events, deep sternal infections, or atrial fibrillation between the groups. These results are consistent with those of Bhamidipati and coworkers who showed that moderate glycemic control (120–179 mg/dL) in diabetic CABG patients were associated with the least amount of morbidity and mortality [2]. The American College of Physicians now recommends achieving a more moderate glucose level of 140–200 mg/dL in surgical and medical intensive care unit patients [31].

Conclusions

Hyperglycemia which occurs during CABG and cardiac surgery increases perioperative morbidity and mortality and results in decreased long-term survival and recurrent ischemic events. Maintaining serum glucose ≤ 180 mg/dL with continuous insulin infusions in patients with and without diabetes mellitus reduces morbidity and mortality, lowers the incidence of sternal wound infections, reduces hospital length of stay, and enhances long-term survival. Patients who require >3 days of ventilatory support or develop sepsis or multiorgan failure should have serum glucose levels <150 mg/dL. More aggressive glycemic control (80–120 mg/dL) in the absence of these complications appears to offer no benefits and does not improve clinical outcomes.

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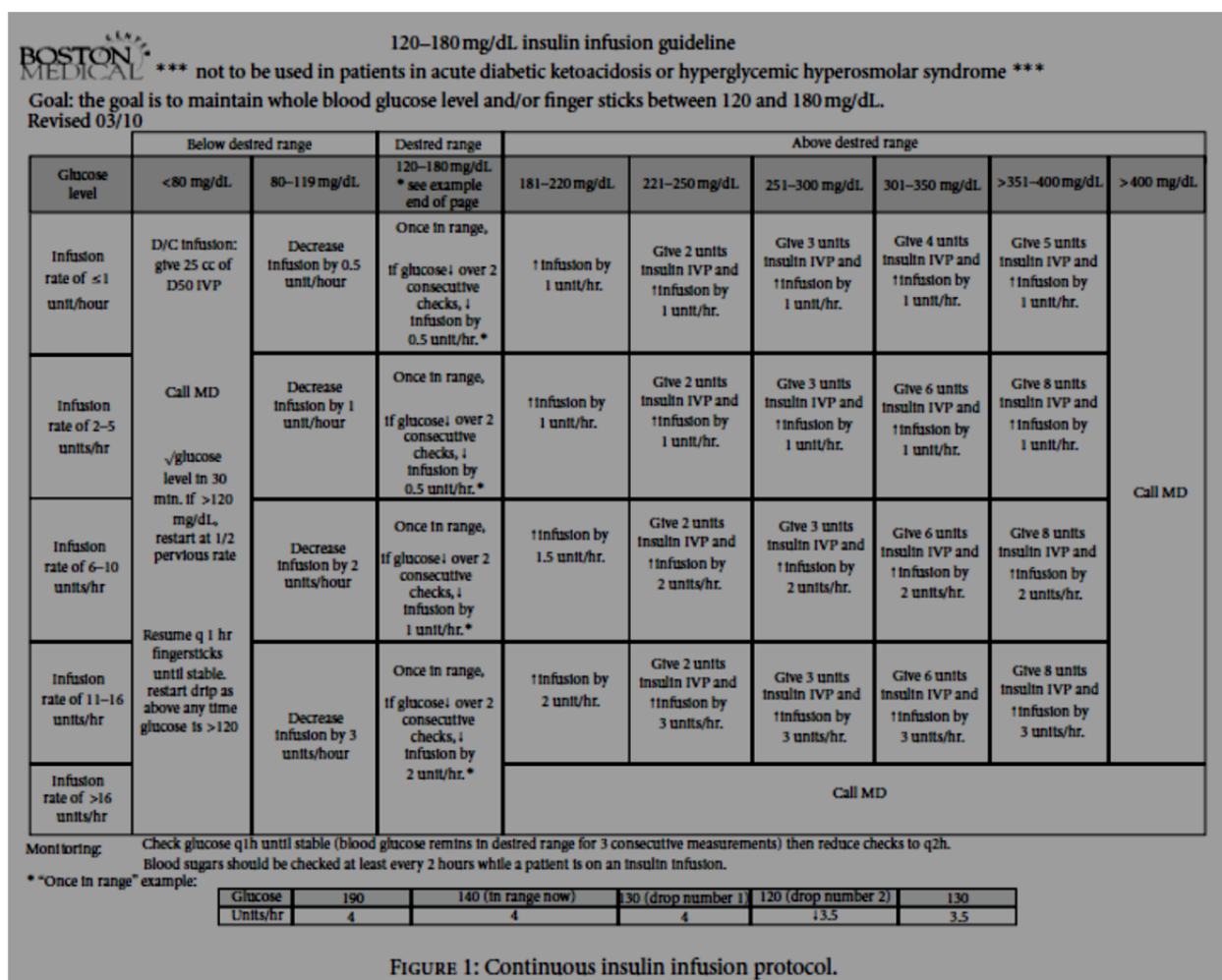


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Limbic encephalitis: clinical and laboratory heterogeneity

Abstract: *The limbic system is a complex set of brain structures that support a variety of functions, including sense of smell, instinctive behavior, emotions, memory, sleep, wakefulness and many others. It includes the olfactory bulb, olfactory tract, olfactory trigone, anterior perforated substance, cingulate gyrus, parahippocampal gyrus, dentate gyrus, hippocampus, amygdala, hypothalamus, mammillary body and midbrain reticular formation.*

The term “limbic encephalitis” means that the main area affected by inflammation or swelling appeared to be the part of limbic system. The core symptoms are subacute development of cognitive disorders, seizures, impairment of consciousness, sleep disturbances, some psychiatric symptoms (such as depression, irritability, hallucinations) and subacute development of short-term memory deficits. The main causes of limbic encephalitis are autoimmune process (paraneoplastic or non-paraneoplastic) and infections. The paper presents the full etiology-based classification of limbic encephalitis with the description of laboratory and radiologic findings specific for different forms of the disease.

Key words: *limbic system, viral encephalitis, herpes simplex virus (HSV), epilepsy, diagnostics, medical case report.*

Definition

The limbic system is a complex set of brain structures that support a variety of functions, including sense of smell, instinctive behavior, emotion, memory, sleep, wakefulness and many others. The term was firstly introduced in 1952 by the American scientist Paul MacLean [1]. The structures that form limbic system are the following: the olfactory bulb, olfactory tract, olfactory triangle, anterior perforated substance, cingulate gyrus (responsible for the regulation of autonomic functions of heart rate and blood pressure), parahippocampal gyrus, dentate gyrus, hippocampus (long-term memory formation), amygdala (aggression and caution, fear), hypothalamus (regulation of the autonomic nervous system through hormones, regulation of blood pressure, heart rate, hunger, thirst, sex drive, sleep and wake cycle), mastoid body (memory formation) and midbrain reticular formation.



The term "limbic encephalitis" (LE) is used when the primary affected brain region (inflammation, swelling) includes the limbic complex (limbic system). Limbic encephalitis (LE) was described clinically for the first time in 1960 by Brierley and others [2], who have submitted observations of 3 cases of patients with subacute encephalitis, mainly affecting the limbic system.

In 1968 Corsellis et al. [3] suggested the term "limbic encephalitis" to describe patients with subacute short-term memory loss, dementia and involvement in the inflammatory process of the gray matter structures of the limbic system in combination with bronchial carcinoma. Thus they have established for the first time the link between LE and systemic neoplasia.

Limbic encephalitis is characterized by subacute symptoms of cognitive disorders, seizures, lethargy, sleep disorders, certain psychiatric conditions (such as depression, irritability, hallucinations), and subacute short-term memory impairment. The most common causes of the LE are autoimmune process (paraneoplastic or nonparaneoplastic genesis) and infection.

Autoimmune limbic encephalitis

Autoimmune LE (like all autoimmune encephalitis) is a group of diseases caused by inflammation of the central nervous system (CNS) as the result of interaction of autoantibodies in cerebrospinal fluid and blood serum with specific neuronal antigens. In this case antineuronal antibodies directly affect two types of antigens: intracellular antigens or so-called "classic paraneoplastic antigens" and cell membrane's antigens.

The immune response against intracellular antigens is typically associated with cytotoxic T-lymphocytes, and responds poorly to therapies, while the immune attack against membrane antigens involves antibodies and due to that responds to medication better [4, 5, 6, 14].

Although it is usually described that the antigens in paraneoplastic LE are localized intracellularly and in non-paraneoplastic the localization takes place on the neural membrane, recent research data indicates that both types of antigens could be located both in the presence and absence of the tumor [4, 6, 7].

Paraneoplastic limbic encephalitis

Paraneoplastic neurological syndromes caused by antineuronal antibodies arise when the malignancy is localized outside the central nervous system expresses antigens identical to those

expressed by neurons (table). Thus, the immune response is manifested in the form of antibody synthesis, the aim of which is both tumor and specific areas of the brain. Most frequently the development of paraneoplastic LE is associated with tumors such as lung carcinoma (50%), predominantly small cells; testicular tumors (20%); breast carcinoma (8%); non-Hodgkin's lymphoma; teratoma and thymoma [8, 9, 15].

Antibodies associated with paraneoplastic limbic encephalitis

[10, adapted by I.A. Kiselev]

Antibodies against membrane antigens	Antibodies against intracellular antigens
Anti-NMDA	Anti -Hu
Anti -AMPA	Anti -CV2/CRMP-5
Anti -GABA β R	Anti -Ma2

Radiological findings. Neuroimaging of the affected limbic area is identical regardless of the type of the detected antibodies. In some patients on magnetic resonance imaging (MRI) there are no lesions, especially in the presence of anti-NMDA antibodies (more than 50% of patients with paraneoplastic LE have a normal MRI result). Among patients with changes on the MRI, the most common findings are hyperintense signal on T2-weighted and FLAIR in mesial part of temporal lobe (hippocampus), and frontal-basal and insular areas. Other possible areas of lesions, especially in patients with anti-NMDA antibodies include cerebellum, basal ganglia and brain stem.

Antibodies against membrane antigens (anti-NMDA antibody). The aim of the impact of these antibodies are epitopes of heterometric NMDA receptors containing NR1 and NR2 domains localized predominantly in the hippocampus and anterior regions of the brain. Typically, their presence is associated with ovarian teratoma and occurs mainly in young women. The clinical picture of the disease usually resembles the flu, accompanied by psychiatric symptoms, seizures and impaired level of consciousness.

Antibodies against membrane antigens (antibodies anti-AMPA). AMPA-receptors are a subtype of glutamate receptors (GluR). Antibodies against GluR1 and GluR2 of AMPA-receptors or so called "new neuronal surface antigens" are concentrated mainly in the hippocampal nerve fiber interlacements. The GluR2 subunits are also expressed in the cerebral cortex, basal ganglia and cerebellum, causing the clinical picture to exceed the profile of the classic LE syndrome-complex. Mostly women are affected (90%), aged about 60 years, most cases are associated with small cell lung cancer, thymoma and breast carcinoma.



Antibodies against membrane antigens (anti-GABA β R antibodies). These antibodies react against GABA β receptors (receptors for gamma-aminobutyric acid), in particular against the β 1 subunit (GABA β 1). About half of the LE that are associated with the anti-GABA β R antibodies have been described in patients with small cell lung cancer. The predominant clinical manifestation is a subacute onset of focal or generalized seizures in frequent association with the classic symptoms of LE.

Antibodies against intracellular antigens (anti-Hu antibodies). In most cases LE that is associated with anti-Hu antibodies develops in patients with small cell lung cancer, although (in fewer cases) may be combined with thymoma or neuroblastoma. Clinically, symptoms may manifest a wide range of CNS disorders, including classic LE syndrome-complex. Brain MRI findings vary and may include hyperintensity in T2-regime in the mesial part of temporal lobe in case of isolated LE, failure or atrophy of the cerebellar cortex with the presence of cerebellar syndromes or hyperintense signal from the brain stem in case of its' affection.

Antibodies against intracellular antigens (anti-CV2 / CRMP-5 antibodies) – autoantibodies against cytosolic phosphoprotein response to kollapsin that is most highly expressed during development of the nervous system. The presence of anti-CV2 antibodies is associated with small cell lung cancer and (in fewer cases) with thymoma. The clinical picture of the disease is heterogeneous and may include LE syndrome-complex, cerebellar syndromes (paraneoplastic cerebellar degeneration), the involvement of the peripheral nerves (paraneoplastic polyneuropathy) and eyes (paraneoplastic optic neuropathy). Among the radiological findings, which vary, may be MR signs of LE, cerebellar degeneration, or, most commonly, striatal encephalitis.

Antibodies against intracellular antigens (anti-Ma2 antibodies). These antibodies are associated with predominant involvement of the limbic system, but can also indicate a failure of the hypothalamus and brain stem. They are detected in blood and / or cerebrospinal fluid, mainly in young men with testicular germinomas and, in fewer cases, in elderly patients with small cell lung cancer. Changes on MRI in 75% of all cases correspond to the LE picture or mixed picture of lesions of the limbic, diencephalic and stem areas of the brain.

Nonparaneoplastic limbic encephalitis

Antibodies against the antigens of the voltage-gated sodium channels. Nonparaneoplastic LE is classically described as a secondary one in proportion to the presence of antibodies to the voltage-gated sodium channels, especially in their Kv1.1 subunit. However, these antibodies may

be directed to other proteins of the same channels: LGI1 (leucine-rich glioma inactivated protein 1), CASPR2 (contactin-associated protein-2) and contactin-2. Clinically, patients with LE that is associated with antibodies to voltage-gated sodium channel show the classic triad of memory impairment, confusion and seizures. Another very revealing diagnostic criterion is the presence of hyponatremia. The presence of anti-CASPR2 antibodies is not exclusive to nonparaneoplastic LE, because it correlates significantly with the presence of tumors, in particular thymoma. MR pattern in 50% of patients presents an increased T2 signal from mediobasal parts of temporal lobe of the brain, some of the findings may be unilateral.

Anti-GAD antibodies. Glutamic acid decarboxylase (GAD) is an intracellular enzyme needed to convert the exciting neurotransmitter glutamate into inhibitory neurotransmitter GABA (gamma-aminobutyric acid), and its deficiency is manifested in the form of motor hyperexcitability and mental hyperexcitability of the CNS. Anti-GAD antibodies are markers for many autoimmune diseases, such as avoidant syndrome, cerebellar ataxia and temporal lobe epilepsy. In most cases, the presence of anti-GAD antibodies is accompanied by autoimmune processes and is associated with the pathogenesis of type 1 diabetes, although some patients have connection with the presence of a tumor.

Parainfectious limbic encephalitis

Despite the broad spectrum of description of viral, bacterial and fungal pathogens associated with LE, the most frequent etiologic factors include viruses, particularly herpes simplex virus type 1 (HSV-1), which is responsible for not only the development of viral encephalitis in general, but for LE in particular. It was shown that among immunocompetent patients in more than 70% of all cases LE development was due to the persistence of HSV-1 in neurons in the limbic system of the brain. The most common cause among immunocompromised patients, particularly those infected with HIV, as well as in patients with a history of bone marrow or stem cells transplantation is considered to be other types of herpes simplex virus, such as herpes simplex virus type 2 (HSV-2) and human herpes virus types 6 and 7 (HHV-6 and HHV-7).

Typically, the clinical manifestations of parainfectious LE associated with viruses of the family Herpes viridae include subacute epileptic seizures, persistent fever, disorders of short-term and operative memory and lethargy (sleepiness), which usually progress more rapidly than in other forms of LE and lead to a rapid decrease of the level of consciousness [4, 11]. The diagnostic method of choice in this case is the technique of polymerase chain reaction (PCR) to

identify the genome of deoxyribonucleic acid (DNA) of herpes viruses in the liquor (sensitivity and specificity of methods are close to 94% and 98% respectively) [4, 5, 11]. Although there is a risk of a false-negative result in the first 48-72 hours from the onset of symptoms, and after 10 days of the acute period [5]. CSF analysis may also reveal pleocytosis and increase of protein, but these findings are nonspecific for parainfectious LE.

Radiological findings. MRI is the "gold standard" for detection of brain lesions in 90% of patients with LE associated with HSV-1. Examination usually reveals bilateral symmetrical changes on T2 and FLAIR images, including: hyperintense foci of edema, hemorrhage or necrosis and affection of basal parts of temporal lobes and the orbital regions of the frontal lobes with the spread to the insular region. Basal ganglia are usually not affected. Diffusion-weighted imaging (DWI) enable to visualize the cytotoxic edema. Pathological uptake of contrast agent (gadolinium) is not detected in the initial stages of the disease, but can be observed in the hippocampal region of the cortex as the disease progresses, usually 1 week after the onset of symptoms. Microhemorrhages at mediobasal parts of the cerebral hemispheres in the early stages of development of this type of LE are a particular finding and most characteristic of the subacute phase of the disease. Using the method of proton magnetic resonance spectroscopy (MR spectroscopy) in the parainfectious LE it is possible to identify a decrease of N-acetylaspartate (NAA) and elevation of damaging neurotransmitters of glutamate- glutamine complex (Glx) at various sections of the limbic system, more often in the hippocampus [12, 13, 16, 17].

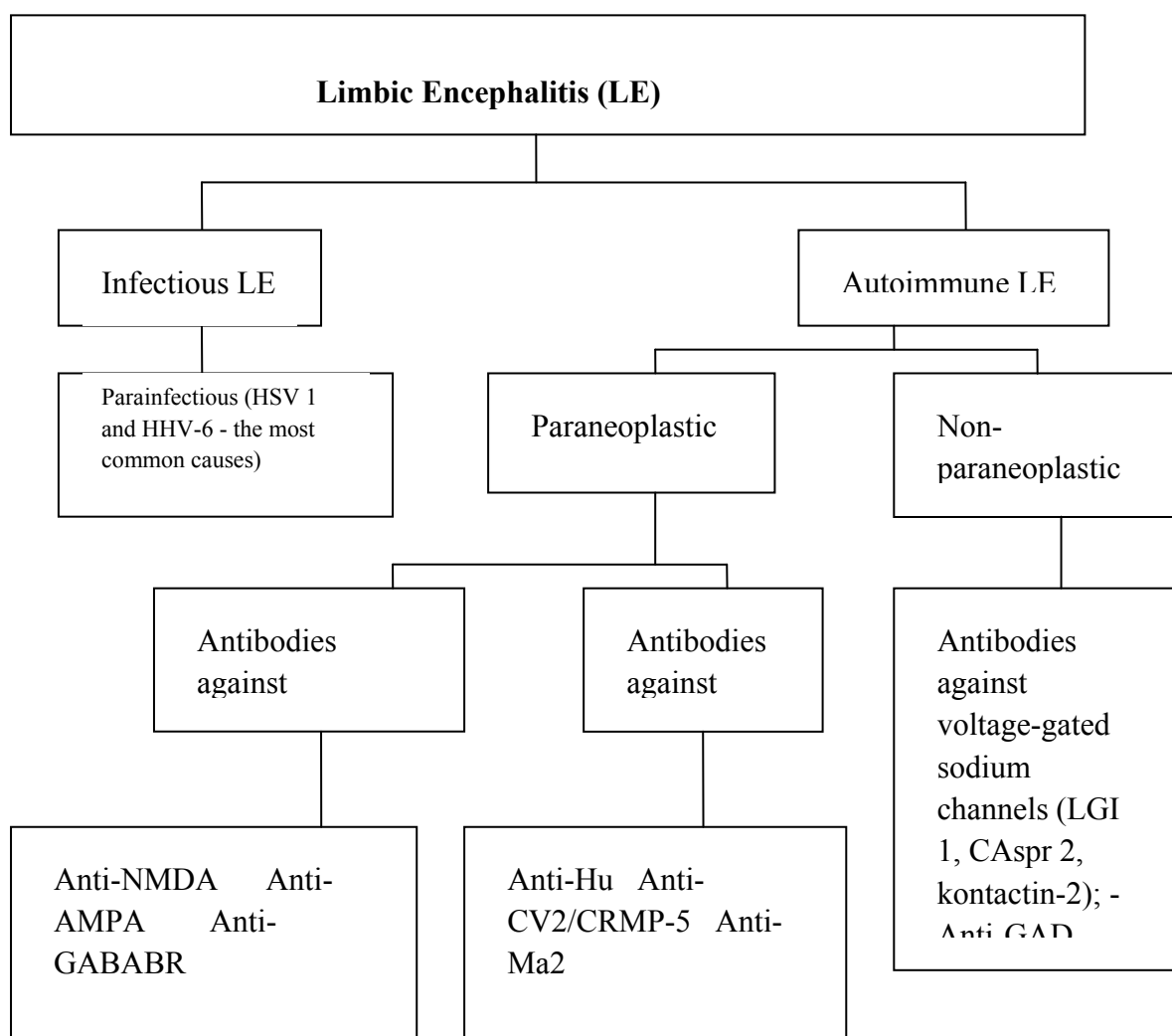


Figure 1. Aggregate classification scheme of limbic encephalitis according to the etiological principle [10, adapted by I.A. Kiselev]

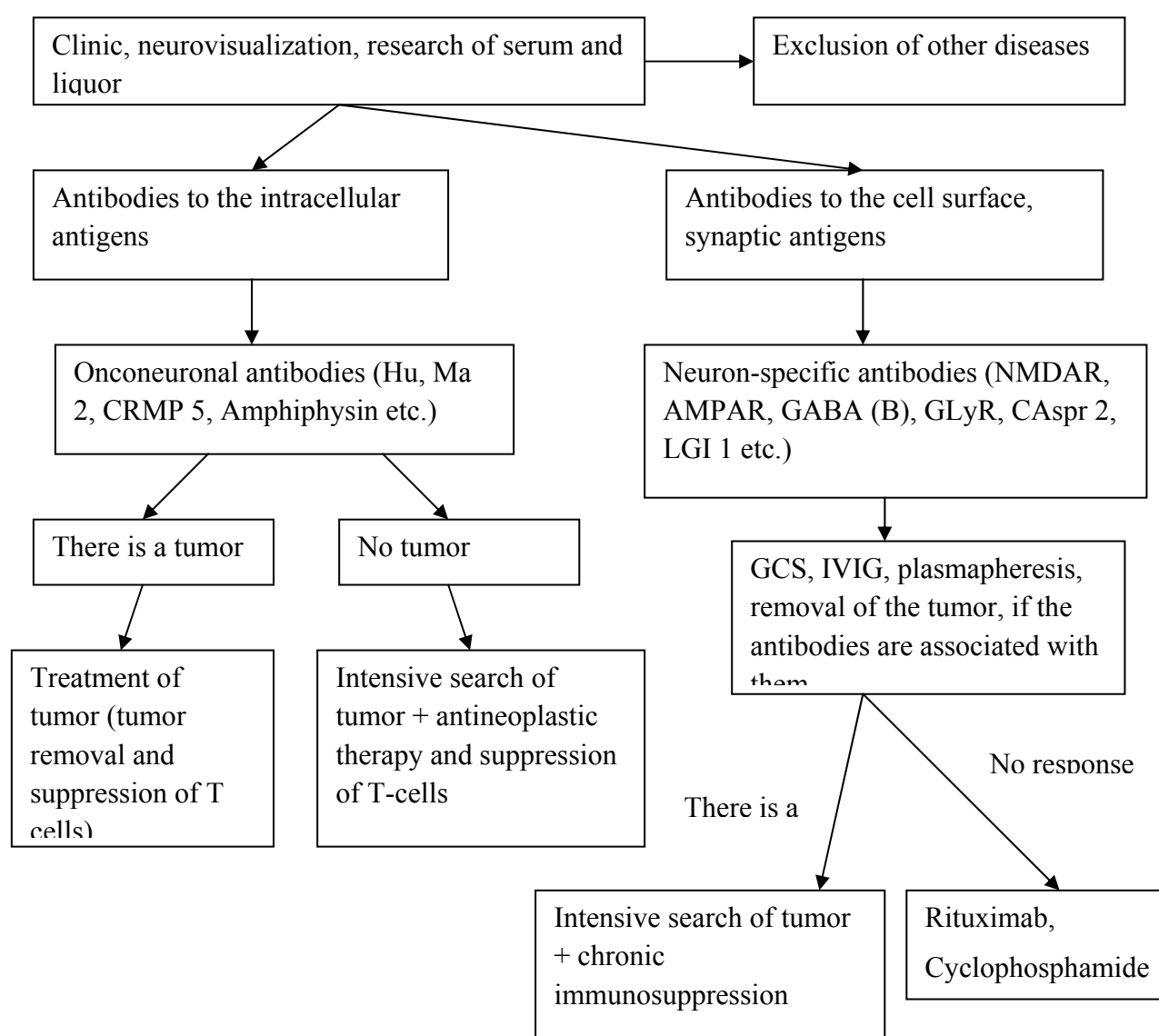


Figure 2. Algorithm for the diagnosis and treatment of autoimmune limbic encephalitis [21, adapted by N.A. Shnayder]

Conclusion

Thus, the limbic encephalitis is an actual problem of modern health care. Its incidence (in particular, parainfectious LE) is high, as well as the frequency of undiagnosed cases with the latent course. Late diagnosis of LE entails great economic and social losses for society due to the high risk of forming hard- to- treat symptomatic focal epilepsy, disability of working-age patients, chronic course (more often remittent) of the disease, with underlying chronic replicative relapse of herpes virus infection [18, 19], which require a comprehensive approach to diagnosis and treatment of the disease from the neurologist-epileptologist (Fig. 1, 2). Collaboration of the neurologist- epileptologist with a radiologist, a clinical neurophysiologist and immunologist allows reducing considerably the incidence and severity of LE complications, improving life



quality of the patients [20] and prognosis due to stabilization of pathological process in the presence of adequate pathogenetic therapy of symptomatic epilepsy even in the conditions of primary chronic course of LE [12].

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Influence of Implant-Retained Denture on Quality of Life of Patients with Partial or Complete Tooth Loss

ABSTRACT

The literature review on implant supported removable prosthetics is presented in this article. Different authors' views are described concerning the problem of implant - retained denture and its effect on patients' quality of life, the results of their study are analyzed as well.

Key words: quality of life, dental implants, removable denture.

In the recent years dentistry has been is on the rise. Possibilities of prosthetic dentistry, and with it needs of patients to treatment have greatly raised the demands. If 40 years ago there were only tentative steps on introduction in practice of dentistry prosthetics on implants, in our days, this service can be offered by almost every dental clinic.

However, despite the appearance of numerous works on the study of properties and characteristics of applying dental implants, the psychosocial effect of this treatment remains poorly studied. Also, many authors have confirmed the influence of the state of oral cavity on psychological status of patients, which suggests that it should be studied as carefully as clinical status. However, it is not always unhealthy dental state affects patient's quality of life, as well as lack of objective pathology cannot be a cause of full satisfaction of the patient, regardless of the quality of aid.

Compared with traditional removable dentures, the implant-retained dentures are associated with more comfort, stabilization, aesthetics, and have a higher positive impact on life quality of patients. Such prostheses are perceived by patients as an integral part of their dentition and thereby significantly simplify everyday life.

According to many studies, prosthetics complete and partial removable dentures with implant support contributes to the enhancement of satisfaction with the prosthesis and improve the quality of life of patients [1,9,12,13,15,23].

According to many authors, the satisfaction of removable protezirovaniia implants depends on various factors. So, according to M. Inukai et al., the correlation between воспринимаемой жевательной эффективностью stomatologicheskoy quality jessicamullen neuleutasch and the number of missing teeth, however, the impact of gender and level of education of patients [3]. M. Al-Omiri et al. notes that prior to the treatment of elderly patients

were more satisfied with their appearance, rather than the young, however, after the treatment, patients of all ages showed the same satisfaction with the prosthesis [8].

As for complete dentures with implant, S. Raps et al. found no significant differences in cancellous wear, stabilization, speech and aesthetics, depending on prepatient. M. Al-Omiric et al. also notes the dependence of satisfaction with the prosthesis from the gender of the patient both before and after treatment [8]. J. Balaguer et al. noted no statistically significant effect of gender on overall satisfaction with the prosthesis. Were not found significant differences between age and различными показателями удовлетворенности, except for stabilization. According to J. Balaguer et al., elderly patients bilimine of удовлетворены стабилизацией протезов. However, men were more satisfied with the chewing of food than women [14].

At the same time, overall satisfaction with removable dentures with implant supported significantly higher satisfaction than traditional full dentures [10,18].

With regard to the area of overlap of the prosthesis and level of satisfaction, T. and B. Bergendal Enguistne found statistically significant differences between the upper and lower jaws [4]. At the same time, many authors claim that mandibular dentures with implant supported with statistical confidence are perceived by patients as more convenient compared to traditional full removable laminar dentures (MTPP) [7,18].

As to the number of implants to the denture, as well as of S. Temmerman et al., statistically significant differences in the level of satisfaction and number of implants was not found [2].

S. Harderc et al. notes the positive effect of complete dentures on the lower jaw based on the implant 1 on the quality of life of patients and masticatory efficiency. Have been noted 4 fracture of prosthesis basis in the midline [23].

O. Geckili et al., studied the effect of complete removable MTPP on the lower jaw supported on 2 implants on quality of life of elderly patients and also came to a positive conclusion [7].

The aim of another study conducted by O. Geckili et al., was measuring the success of the full removable prosthesis of the lower jaw based on 3 of the implant. We investigated the quality of life of patients using questionnaires and maximum occlusal force and the loss of marginal bone surrounding the implant, three years after prosthetic treatment. As a result, it was found that regardless of the type of attachments, dentures with dental implants is the most effective and preferred for elderly patients [6].

According to G. T. Stoker et al., the most favorable is the use of prostheses with beam locking

system on two implants, as it is less expensive than four implants, but no less reliable and does not require frequent visits to the dentist, when you commit on the spherical attachments [19].

According to A. Preciadoc et al., the most comfortable to wear are mandibular MTPP with implant supported than the maxillary. At the same time, A. Preciado noted that the presence of as traditional antagonist MTPP significantly lowers the quality of life of patients. The authors also found that fixation nacherbeneinsetzung most simplifies the use of dentures and eating in particular, while the presence of ulcers of the oral mucous membrane or candidiasis was observed only when using girder fixation systems [5].

Remains poorly studied the quality of life of patients with partial edentulous. According to H. J. Nickenig et al. the quality of life of these patients after dental implantation has changed from 17.1 to 5.4 on a scale OHIP-G 21 he neared that of the control group with preserved dentition (3,4 scale OHIP-G 21) [12].

W. D. Gates et al. also evaluated the quality of life of patients with partial edentulous after the installation of removable partial dentures with implant supported. According to the authors, the estimate of the scale OHIP-49 decreased by an average of 11.8 points in 12 weeks after implantation [20]. M. Fillionc et al. in a similar study uses the index of the GOHAI and also notes a significant increase in the quality of life of patients, regardless of the number of implants and time between studies [21].

According to research by D. Lopsc et al., for removable prosthesis may be freely applied shortened dental implants that can replace standard implants in difficult anatomic conditions (severe atrophy of the alveolar part of the mandible, pneumatic type top jaws). The authors noted the poor survival rate of short implants only in the distal part of the maxilla, where it often occurs III-IV тип bone tissue [17].

S. Annibalic et al. notes that removable dentures, fixed on a shortened dental implants are a good solution for patients with significant atrophy of the alveolar crest in the short term, however, to identify long-term results, further studies are needed [16]. However, regardless of the type of implants, patient satisfaction with prosthesis remains consistently higher than with dentures, traditional dentures.

As for the economic side of the question, then, according to V. Nicolaec et al., by correctly informing patients about the benefits of implant prosthetics, even if they had not received such treatment previously, patients make decisions about treatment and paid even ready to monthly payments [11].



The restoration of dentition defects with partial and complete dentures-driven intraosseous dental implantational not just eliminate the aesthetic disadvantage, but also greatly facilitate the adaptation of the patient to wearing prosthetic design, to eliminate the feeling of insecurity and to a large extent fill chewing efficiency, which in itself contributes to the quality of life of the patient. Thus, questions the widespread introduction of removable prosthesis based on intraosseous implants in dental practice remains current.

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Problems of Improvement of the Complex Treatment of Mandible Fractures at the Present Stage

ADSTRACT

There is a review of literature on the themes of: epidemiology, clinic, pathogenesis of inflammatory complications and methods of complex treatment of jaw fractures. Pathogenic mechanisms of the inflammatory process in the area of injury, connected with impaired microcirculation, changes of blood rheology and processes of bone formation are observed. The characteristic of the basic principles of treatment is given. Despite the extensive studies of this problem, posttraumatic complications still remain high, so it is necessary to conduct further researches.

Keywords: mandible fractures, maxilla-facial traumas, concomitant injury, posttraumatic osteomyelitis, complex treatment, osteosynthesis, distraction-compression devices, bone joint, intraosseous drug administration, prevention of complications.

INTRODUCTION

Nowadays a number of traumas of maxillofacial area has a tendency to increase, and that's why it is considered an actual problem in medicine [7, 20]. Jaw fractures occupy a significant part in the structure of traumas of face bones [22]. At the same time from 11 to 36% of cases are defined as a complication of purulent processes of the soft tissues, suppuration of bone tissue, which lead to post-traumatic osteomyelitis. Untimely provision of specialized medical care, unsatisfactory immobilization of bone fragments, the presence of periapical foci of infection, reducing of the immunobiological reactivity of the organism, impaired lipid peroxidation cause complications of jaw fractures [7, 37].

Despite extensive studies of these problems, the frequency of complications is still on a high level. And that's why the health-care organisations of maxillofacial surgery focus on prevention, early diagnosis and treatment of inflammatory complications of traumatic injuries of the jaw.

Clinical and epidemiological characteristics. Nowadays it is established, that in the structure of pathological processes of maxillofacial region face bones fractures are up to 30% [6, 27]. And this is particularly connected with the peculiarities of social and economic development

of society in the last period [2]. Fractures of the skull and facial bones are concerned to difficult ways of traumas with prolonged temporary disability and further consequences for health [20]. Men of 20-30 years are more often exposed to jaw traumas, they are the most active part of population, and it is a significant social problem of nowadays [43].

The anatomical and physiological features of the facial bones increase the incidence of mandibular fractures in comparison with fractures of other areas [39]. In this case, the lack of protection of jaw other bones by the other facial bones and its extended position, as well as an arched shape, and also its mobility cause over than 50% of jaw fractures [17, 18]. In addition, the fracture areas are often localized in the most subtle and curved parts of jaw. These "weak" places are: cervix condyle, angle, chin area and the point of the trigeminal nerve area exit [27]. It is worth noted, that the most cases of fractures are compound, which in unfavorable dental status may lead to inflammatory posttraumatic complications [18].

Pathogenic mechanisms of reparative osteogenesis. It is well known that any injury causes a stress for organism. The outcome of treatment and possible complications for jaw fractures depends on microcirculation in maxillofacial area [8, 24], which has pathology regulation, connected with the state of autonomic nervous system [45]. Bone fracture nexus starts with the second (active endosteal and periosteal osteogenesis) and continues to the third month with formation of dense fibrous connective tissue [19,29]. Biologically active substances, which are produced in traumatic inflammation, have some peculiarities, such as an extension of small vessels, an acceleration of capillary blood flow, an increased permeability of the capillary endothelium [46]. While this, happens the migration of leukocytes and output in the intercellular space from the vascular transudate with high concentration of protein [9, 28]. Inflammatory response in the injured area is the trigger reparative of osteogenesis and is aimed to fight against infection, removal of necrotic cells and tissues [40]. Violation of rheological properties of blood occurs mainly by increasing of its viscosity, erythrocyte aggregation and decrease of their deformability [28].

Progenitor cells from bone marrow which can stimulate reparative process of bone and cartilage tissue, as well as tendons and other connective tissue in the fracture zone work in traumas [6, 9].

In scientific literature there are some data about the role of hypothalamic neurosecretion for the development of reparative potency of cellular elements and in correction processes of reparative regeneration in tissues, there is a decrease in the inflammatory process, stimulating effect on endothelial cells, fibroblasts and functional activity of macrophages [17].

There are two processes which occur simultaneously while forming a callus, but in different cell populations in a particular moment dominates a particular process and each one has its own epigenetic components, parts of which are to optimize every step of the regeneration process [40]. Wherein after the formation of thrombin fibrinogen transforms into fibrin, which is the first step to healing wounds. Fibrin degradation products cause migration of osteogenic cells which provides more rapid regeneration of the fracture line [9]. However, the reparative process proceeds as restitution in part formed by unformed dense fibrous connective tissue, where by the 35th day the formation of a dense fibrous connective tissue happens, and it is the best option [29].

It is well known that maxillofacial area has a highly developed blood vessels, and a violation of local blood circulation immediately affects on the metabolic processes in cells and tissues, increases hypoxia [2, 37]. Changes of gemomicrocirculation lead to imbalance and disorder of mineral balance of the internal environment of organism [42]. At the same time, a violation of the trophic bone caused not only by the damage of the vessels which supply the jaw bones, but also a violation of nerve conduction – the damage of the third branch of the trigeminal nerve [41].

It should be noticed, that under adverse conditions of the fracture, such as trophic disorders in fragments due to their damage of the lower alveolar nerve consolidation may be protracted [4, 16]. During prolonged hypoxia of tissues occurs anaerobic glycolysis, retardation of osteoblast differentiation, formation of collagen with lower content of hydroxyproline and hydroxylysine is formed, and that lead to ossification deceleration [38]. Endosteal osteogenesis is inhibited due to the lack of vascular growth in the area between the fragments of jaw within 2-3 weeks [43]. By the end of the third week the periosteal callus of cartilage is formed [12].

Pathogenetic mechanisms of posttraumatic complications. Disturbance of microcirculation in the damaged area plays a big role of inflammation of maxilla-facial bones fractures. Endothelial damage of the vessel walls causes a decrease in antithrombogenic properties. Wherein hemostatic system activates, rheological properties of blood changes [5, 28].

Local and common risk factors play a role in the occurrence of posttraumatic complications of mandible fractures. All kinds of metabolism are disturbed in a trauma of maxilla-facial area obtained in a state of alcoholic and narcotic intoxication. This reduces compensatory and adaptive reactions of organs and system [35].

Pathogenic microflora of the oral cavity plays an important role in development of posttraumatic complications. This microflora falls into the gaping wound often in the angle of

the mandible under the interposition of the masticatory muscles [30]. At the same time oral fluid with an abundance of different microflora constantly gets into torn mucosa, where "valve gear" of bone infection activates [13]. Such localization of the fractures in area of the dentition are considered primarily complicated. Meanwhile, the presence of oral fixation structures after immobilization of bone fragments contributes to a violation of periodontal tissue trophism and self-purification of the mouth, which have a negative impact in the development of inflammatory complications due to activation of pathogenic microflora [31].

Blood clotting and fibrinolysis of saliva factors play important role in the development of complications and significant changes in the first days after injury. Decrease of the antithrombogenic properties of the vessel wall leads to the increased deposition of platelets at the vessel wall, activation of hemostasis and thrombosis [28]. The platelets create preconditions thrombus formation due to activation of the coagulation system [9].

The high prevalence of major dental diseases are determined in population, which lives in severe climate of the North [33]. Chronic foci of infection in the mouth contributes to activation of pathogenic flora due to violation of metabolic processes and immune system in jaw fractures. Which often leads to development of osteomyelitis of the jaw. At the same time, odontogenic infection may spreads from the pathological periodontal pocket when the barrier properties of the boundary of periodontal are broken. Anaerobes, enterococci, staphylococci, *Pseudomonas aeruginosa*, etc. are causative agents of infectious-inflammatory process [31].

Complex treatment and prevention of complications. Jaw fractures treatment has always been a serious problem in maxillofacial surgery. Despite of their extensive studies, the complications development, such as infections in posttraumatic period remains, are still on a high level and their amount averages from 9 to 44% [23]. A multi-disciplinary approach has always been considered. Early reduction and fixation of bone fragments, restore of anatomical integrity, resume function, healthy food, the maintenance of oral hygiene are the main moments in treatment of jaw fractures [35, 39].

Today there are many different methods of treatment of mandibular fractures. For fixation of bone fragments different metal structures can be used: bone suture, bone metal mini-plates, bracket with the shape memory, Kirschner's needle, etc. [18, 44]. Extraoralosteosynthesis where not enough stable fixation of bone fragments affects on the frequency of postoperative inflammatory complications [1]. And that's why the oral method of osteosynthesis is recommended, which creates the optimal conditions for fracture healing [11]. Another advantage of this method of surgical treatment is the lack of scars on face and the probability of the facial

nerve branches damages. The stability of extrafocal osteosynthesis between the fragments of jaw is the important moment of extrafocal osteosynthesis and that helps to regulate bone formation processes in the fracture line, not interrupting its natural course. Its negative moments are the lack of serial production of compression-distraction devices, scientific basis and devices departments of maxillofacial surgery [18].

It must be emphasized that in open osteosynthesis excised the soft tissues, which disturbs microcirculation and in damages of branches of the facial nerve can lead to paresis of facial muscles, an exfoliation the periosteum, at the same time processes of formation and ossification of callus are broken [29]. Osteosynthesis with small plates have the advantage over the other constructions, because the periosteum is peeled from the vestibular side. Because of different shapes, forms and sizes using of small plates is possible in complex comminuted, oblique fractures, where there is a stable fixation of bone fragments [20, 44].

Nowadays there are different methods in jaw fractures treatment. For example, one of these methods is the use of bone calcium phosphate cements in oral and maxillofacial surgery, which are used as osteoplastic material [15]. Fibrin clot in injuries of jaw bone to stimulate the regeneration of the damaged area is also successfully applied in clinic [9].

One of the key methods in prevention of complications of jaw fractures is the use of antibacterial drugs [32]. Lymphotropic antibiotic therapy is more effective than intravenous, which is connected with the formation of interstitial fluid an optimal concentration of antibiotic [23]. But at the same time the efficacy of the intraosseous injection of drugs in treatment of jaw was determined, it in some extent helps to prevent the development of post-traumatic inflammatory complications [26].

It is well-known that the use of systemic action drugs is not expedient, because in fracture area a violation of blood circulation of local character can be observed [10]. In this case osteotropic drugs such as lincomycin, morfocyclin, vibramycin and others are recommended to be appointed [3, 38]. But at the same time many antibiotics, which are appointed in jaw fractures possess are highly hepatotoxic. And their cumulative properties in combination with other drugs are not well learned [23].

There is information about efficiency of hyperbaric oxygenation in acute posttraumatic period of severe maxillofacial injury in literature [25]. Also contains information about efficiency of topical application of ozonated distilled water, where antioxidant systems activate [36]. Using percutaneous electroneurostimulation has a significant positive effect on the recovery of sensory-paresthetic disorders in patients with jaw fractures [16]. Patients need to take

high-calorie foods rich in calcium and minerals to restore bone structure of mandible and organism. Use of immunomodulators increases number of immunocompetent cells and its functional activity [14].

Despite of extensive studies in complex treatment and prevention of post-traumatic complications of jaw fractures this problem is not solved completely. New methods and ways which can increase the effectiveness of treatment and prevent complications are searched.

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Comparative Analysis of Application of Subclavian Catheters and Implantable Venous Ports in Treatment of Oncologic Diseases in Children

ABSTRACT. Comparative analysis of applying subclavian catheters (SC) and implantable venous ports (IVP) in children with oncologic diseases is conducted. The study testifies to higher prevalence of IVP as compared with SC. We detected that there are less complications and technical difficulties during installation IVP than SC, so they are subject to correction during operations more frequently. The application of subclavian catheters is accompanied by a higher rate of complications and breakdown of protocols of antitumor treatment as compared with IVP.

Keywords: pediatric oncology, implantable venous ports, catheter-associated bloodstream infections, chemotherapy.

INTRODUCTION.

Over the past decades have seen marked success in the treatment of cancer in both children and adults. Survival over 5 years with a number of clinical entities reaches 80 percent or more. This was made possible by the development of effective programs for the integrated treatment in which chemotherapy (CT) played the leading part. [5]

Modern chemotherapy of cancer - a combination of chemotherapy treatment Cyclic (CP) used in sequence with respect to each other administered as an infusion of different duration (from 15 minutes to 24 - 72 hours or more) [15, 17].

Intravenous CP administration method is central to the most cancers is associated with irritation of the vessel wall, flebothrombosis, tissue necrosis, extravasation of drugs. In addition, during chemotherapy require multiple diagnostic fences venous toxicity of treatment to control and monitor the dynamics of the disease, as well as I / maintenance infusion therapy [16, 18].

The use of peripheral veins because of their small diameter, low blood flow, shortest path for bacteria contaminated surface of the skin to the vessel lumen, high probability of chemical thrombophlebitis and extravasation is unacceptable for continuous infusion and repeated administration of the chemotherapeutic drugs [4, 7, 8].

The use of central venous access avoids most of the problems mentioned above. However, central venous catheterization (CVC) associated with a risk of severe complications, such as during catheterization and at catheter operation. The most formidable of them are

catheter infection, sepsis, air embolism. In addition, the presence of an external central venous catheter (CVC) are inevitable discomfort and difficulty in carrying out hygiene procedures. With many months of continuous chemotherapy require repeated catheterization CV, which lead to the growth of related complications [1, 2, 3, 5, 7, 22].

Implantable venous port system (IVP) possess significant advantages compared with the above-described venous access because it does not subject to any external influences, do not cause discomfort to the patient and does not limit their locomotor activity, which is important in pediatrics. Port - a small container - chamber having at the top of the silicone membrane through which a special needle puncture performed for infusion. In the lateral part of the chamber connected catheter, the other end of which is placed in the superior vena cava (SVC). The camera is sutured to the soft tissue of the subclavian region [6, 19, 22].

IVP was invented in 1988 in the United States by Dr. R.T. Woodburn and patented his August 29, 1989 [11]. Puncture camera port can be used only special, not cutting, Huber needle, excluding damage silicone membrane [6, 10, 22].

The aim of the study: minimization of complications during chemotherapy in children with cancer and improving the quality of life.

MATERIALS AND METHODS

Four hundred and twenty-eight pediatric oncology patients underwent placement of a central venous access device between 2010 and 2014. 210 patients (48.2%) underwent subclavian catheter (SC) insertion, and 218 (51.8%) patients – IVP implantation (Table 1).

Both groups were comparable by age, nosological entity distribution and prevalence, and treated according to similar strategies within the same time period.

Venous access system locking between infusions was carried out with a 100 IU/ml heparin solution and a special solution containing 3 ml of taurolidine. In case of catheter thrombosis in the central venous access system, 3 ml of 500 IU/ml Urokinase (solution was introduced with a 15 minute exposition.

Statistical analysis. The statistical analysis was carried out on a personal computer with the help of STATISTICA 7.0 (StatSoft, USA). A χ^2 test and Fisher's exact test were used to assess the statistical significance of the differences. The threshold p-value for statistical significance was 0.05.

RESULTS.

The main results of venous access system implantation and use are given in table 2.

In this retrospective study of 428 pediatric oncology patients insertion of a subclavian

venous catheter resulted in more complications (98.3%) when compared to insertion of a venous port (37.3%) ($p<0.01$). The most frequent complications during insertion of a subclavian vein catheter were difficulty with vein puncture and accidental catheterization of subclavian artery. Procedural complications were more likely (89% vs. 34%; $p<0.01$) to be managed intraoperatively during insertion of a port compared to insertion of a subclavian venous catheter. Late complications that occurred during use of a subclavian catheter (97.3%) were significantly higher ($p<0.01$) compared to venous ports (22.9%). Catheter thrombosis rates were higher for subclavian catheters (35.4%) compared to venous ports (5.0%). Catheter infection rates were higher for subclavian catheters (55.7%) compared to venous ports (2.5%) ($p<0.001$). Taurolidine was not used to lock central venous catheters and this may account for the higher rate of central venous catheter-related infections (73 patients; 12%).

The complications during venous ports and subclavian catheters led to treatment protocol deviation in only 1.7% of patients with an IVP and in 45.9% of patients with a SC ($p<0.01$).

DISCUSSION

Our study confirms the benefits of IVP than SC. Ports used both for chemotherapy and supportive care, as well as for general anesthesia during surgical treatment stages, the introduction of x-ray contrast agents and palliative care, once established for the whole period of treatment and follow-up. SC often installed (905 catheters 210 patients), which was caused as a limited lifespan, and a lot of complications. It is shown that the use IVP at children with cancer significantly reduces the number of complications both during installation and during use when compared with other possible options. Another important advantage - reducing the amount of general anesthesia and the load on the medical staff. The developed technique of implantation of these devices using ultrasound and X-ray equipment reliability and safety.

An important aspect in the conditions of modern economic realities - the cost of treatment. We found that, although the price of IVP is higher than the price of SC, extensive use of the latter is more than 2 times costly, given the cost of diagnosis and treatment of intraoperative complications and performance. This difference is maintained even considering installation costs IVP children with general anesthesia.

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Table 1 – General parameters of the material.

PARAMETER	VENOUS ACCESS	
	SC	IVP
Years	2010 – 2014	2010 – 2014
Number of patients	210 (49%)	218 (51%)
Gender of the patients	Male 118 (56.2%) Female 92 (43.8%)	Male 121 (55.5%) Female 97 (44.5%)
Age	3 months – 17 years	6 months – 17 years
Mean age	8.1 years	11.5 years
Total number of implanted venous access systems	605	118

Table 2 – Comparative analysis of complications during implantation and use of SCs and IVPs.

PARAMETERS	VENOUS ACCESS	
	SC	IVP
QUANTITY	905	218
Intraoperative complications/ complications coped with intraoperatively	98.3% / 33.7%	37.3% / 88.6%
Complications during use	97.3%	22.9%
Thrombotic occlusion of venous access systems/ thrombotic occlusion coped with intraoperatively	35.4% / 63.5%	5% / 100%
Contamination	55.7%	2.5%
Removal by patients	28.9%	0
Complications resulting in treatment protocol deviation	45.9%	1.7%

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Enterovirus Infection at Children

ABSTRACT

The analysis of clinical course of enterovirus infection at children has been carried out. On the base of the Children's city clinical hospital №2 all children underwent the clinical research minimum: complete blood count and clinical urine analysis, throat and nasal swab, including stool sample taken on enterovirus infection. Clinically the enterovirus infection has been detected as herpetic angina with diarrhea and fever. Antiviral drug intake in combination with Cefotaxime (100 mg/kg/day) has manifested good clinical effect.

Keywords: enterovirus infection, herpetic angina, viruses, analyses, enterovirus

INTRODUCTION

Enterovirus infection is a group of diseases, the cause of which lies several types of viruses. Cause disease Coxsackie virus, the polioviruses and ECHO (ECHO). These viruses have the structure of the capsule and the nucleus, containing RNA (a type of DNA). The structure of the capsule may be very different, as are the so-called serotypes (types). The excreting polioviruses 3 serological type. Viruses Coxsackie group are divided into Coxsackie A, the Coxsackie virus and allocate 24 serological varieties, Coxsackie B - 6. Viruses echo allocate 34 serological type. Infection occurs in several ways. Viruses in the environment can get from a sick child or from a child who is infected person [1,2,3].

The transfer mechanism may be airborne (when sneezing and coughing with droplets of saliva from a sick child to a healthy and fecal-oral not complied with the rules of personal hygiene. Most often, the infection occurs through the water, when drinking raw (not boiled) water. The disease begins abruptly with increase of body temperature to 38-39 C. The temperature often may be 3-5 days, then decreased to normal values. Very often the temperature of the undulating current: 2-3 days and temperature, then decreases and 2-3 days is normal digits, then rises again for 1-2 days and will normalize again finally. With the defeat of the mucosa of the oropharynx is the development of enterovirus angina. It is manifested by fever, General intoxication (weakness, headache, drowsiness) and the presence of vesicular rashes in the form of bubbles filled with liquid, the mucosa of the oropharynx and tonsils. The these bubbles burst, and from the formed blisters, filled with white bloom. After recovery at the place of the sores do not leave any traces.

The Aim of the Study: to study the clinical features and course of enteroviral illness in children of early age.

MATERIALS AND METHODS

We examined 50 children at the Children's city clinical hospital №2, Yakutsk with a clinical diagnosis of Herpetic angina. Enteroviral infection. at all children underwent clinical research minimum: General analysis of blood and urine, swab from the nose and throat. All children taken fecal enterovirus infection and identified enterovirus. Virological methods research is aimed at the selection of clinical material (blood, faeces, cerebrospinal fluid) enterovirus infection in cultures of sensitive cells.

RESULTS

In 90% of the surveyed children revealed the presence of herpetic angina. 25% of children showed loose stool up to 5-6 times a day without pathological impurities. 15% of children showed the presence of a petechial rash.

In 90% of children the disease is accompanied by high fever up to 40 degrees. All of the surveyed children were treated before admission to hospital outpatient, received drugs Amoxiclav (21 child), Augmentin (15 children) and Sumamed (14 children). None of the children are not noted positive dynamics of the flow enterovirus infection as a result of outpatient treatment. The highest figures temperature (40 ° C) was observed during the eruption of herpetic elements of the soft palate and the manifestations of herpetic angina.

Changes in the General analysis of blood showed the following picture: leukocytosis exceeding 15 10 60% of children with herpetic angina, other changes in the analysis of peripheral blood is not marked. Currently as antiviral agents mostly used drugs alpha-interferon (Alfa-2A, Alfa-2B), both natural and recombinant. Apply interferons topically and parenterally. All children received preparations of interferons.

All children received cefotaxim in age the dose of 100mg/kg/day, treatment pharynx was performed with a solution of Miramistin, children over two years chlorhexidine 0.2 percent. All examined children 100% had received inpatient treatment for 5 to 7 days.

Conclusions:

1. Enteroviral infection occurs with a high fever, loose stool and herpetic angina.
2. Treatment with oral medications amoxicillin and Sumamed inefficient.
3. The use of antiviral drugs in combination with Cefotaxime (100 mg/kg/day) showed a high effectiveness of treatment.



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The Results of Computer Tomography (CT) and Magnetic Resonance Imaging (MRI) of a rare case of Bilateral Inner Ear Aplasia

ABSTRACT

The results of computer tomography (CT) and magnetic resonance imaging (MRI) of a rare case the analysis of the images is performed and a detailed description of changes on CT and MRI studies is given. This case of aplasia is characterized by symmetrical agenesis of the of bilateral aplasia of cochlea and semicircular canals of the inner ear are presented. In this article cochlea and semicircular canals, and bilateral abnormality of the facial nerve canal, and abnormality of the internal auditory foramen on both sides, as well as unilateral agenesis of the abducent nerve and bilateral agenesis vestibulocochlear nerve. Results of the study indicate a high informative method of CT in the diagnosis of the inner ear abnormalities, as well as the possibility of using MRI in visualizing the cerebellopontine angle for the entire description of its clinical picture.

Key words

Michel aplasia, sensorineural deafness, CT of temporal bones, MRI of cerebellopontine angle and inner ear.

INTRODUCTION

Congenital hearing loss, registered at a frequency of an average of 1 per 1000 live births [1]. The etiology of this disease is heterogeneous. However, according to various authors, congenital anomalies of the inner ear in the average recorded in 20% of individuals with congenital hearing loss. In the structure of the inner ear malformations more than 90% of cases occur in Mondini anomaly - common cavity and hypoplasia of the cochlea, and about 1% cases is Michel aplasia [3].

Michel aplasia is a rare anomaly of embryonic development of the structures of the inner ear. For the first time this anomaly was described by P. Michel in 1863. (Subsequently became known as the "Michel aplasia") on autopsy material 11-year-old deaf boy who died at Children's Hospital of Strasbourg in France [2]. In the study of sectioned material P. Michel said symmetrical bilateral absence of the cochlear and vestibular structures of the inner ear (cochlea and complete

agenesis of the semicircular canals), which is characterized by abnormalities of the skull base and facial nerve canal dystopia and the jugular vein. [2]

Currently, for in vivo diagnosis of anomalies of the inner ear is used radiological methods of investigation, according to the standard classification on the presence / absence and / or resizing of certain structures proposed by R.K. Jackler in 1987 [3].

In this paper first summarizes the results of a computer (CT) and magnetic resonance imaging (MRI) of the rare cases of Michel aplasia, identified patient from Yakutia with congenital bilateral deafness and neuropathy abducens right.

MATERIAL AND METHODS

Patient

The presented case of Michel aplasia was detected in a patient with congenital bilateral sensorineural deafness, which was followed up by Audiology-Logopaedic Center of the Republican Hospital №1 - National Center for Medicine, Ministry of Health of the Republic of Sakha (Yakutia). The patient was examined by an audiologist, speech therapist, psychoneurologist. Study of hearing was conducted with the threshold tonal audiometry on the unit «Clinical Tonal Audiometer - GSI® 60» (Grason Stadler, USA) in a soundproof chamber calibrated Republican Audiology-Logopaedic center. The patient underwent functional studies: reflexometer, tympanometry (Amplaid, Italy).

From anamnesis we know that the patient is born in 1995 (at the time of the study 15 full years), sex, female, Russian, was born from the X pregnancy (birth in time, the weight of 3 kg) III childbirth. The impact of negative factors (ionizing radiation, medication, infectious disease) during pregnancy parents deny. Consists in the dispensary with 3 years Audiology-Logopaedic center of the Republican Hospital №1 (Yakutsk) with a diagnosis of congenital bilateral sensorineural deafness. Enrolled in a correctional boarding school type I for deaf children (Yakutsk). Consists followed up by a neurologist (psychomotor retardation, neuropathy abducens right vestibular ataxia in stage subcompensation) and ophthalmologist (hyperopia I st. OU, retinal angiopathy OU, exotropia). Psychosomatic status corresponds to the age. Abnormalities of the cardiovascular, endocrine systems have been identified. When audiological study, examine the patient observed systemic underdevelopment of speech, speech develops through learning, perception on the basis of visual, spoken and whispered speech are not perceived around the ear. Preferred type of communication based on gestural vocabulary. When the threshold tonal audiometry on both sides recorded remnants of hearing at frequencies of 125,

250, 500, 1000 Hz on air at levels of 75, 90, 100, 100 dB, respectively, according to the International Classification of degrees of hearing loss, deafness corresponds to sensorineural type.

Alternatively, the patient was examined by norms born in 1997, female, diagnosed with congenital Yakut bilateral sensorineural deafness type not established etiology, with preserved bodies of the outer, middle and inner ear, without comorbidity with other organs and / or systems.

Computed tomography of the temporal bone pyramid

Analysis of the petrous held on 4 slice CT scanner Somatom Sensation 4 (Siemens, Germany) in axial projection with thick tomographic layer 1 mm step promotion table 1mm increment reconstruction of 1 mm (program InnerEarSpi), voltage 120 kV, current 70 mA.

When visualizing structures petrous used 2D images as a native axial plane, and in the mode MPR reformation, using the "bone" filter with a window width of 4000 HU, window level +700 HU.

Magnetic resonance imaging area cerebellopontine angle

The study was conducted on magnetic resonance imaging Magnetom Espree (Siemens, Germany) with a magnetic field strength of 1.5 T. We used the isotropic sequence T2 ci3d with slice thickness of 0.6 cm, with an isometric voxel 0.6 x 0.6 x 0.6 cm. With the parameters of the sequence TE (TimeEcho) - 2.81 and TR (TimeRepetition) - 6.25, with a resolution of the image matrix of 384 x 512, with FOV (fieldofview) - 135 x 180.

When rendering of the facial and abducens image used as a native axial plane, and in the mode MPR reformation.

Ethical control

This work was approved by the local ethics committee in biomedical ethics at FGBU "YSC ILC" SB RAMS, Yakutsk, Protocol №16 from April 16, 2009 CT and MRI - research conducted with the informed written consent of the parents of the patient.

RESULTS AND DISCUSSION

For the first time the results of computed tomography and magnetic resonance imaging of the temporal bone and cerebellopontine angle gives a detailed description of a rare case of congenital anomalies of the cochlear and vestibular structures of the inner ear - Michel aplasia.

CT imaging petrous examined patients is shown in Figure 1 (A and B). In a series of CT tomograms visualized ear canal size and shape is not changed. It should be noted that the study oto- abnormalities of external ear was also not detected. On CT images ossicular chain is not changed. The patient has the right (Fig. 1A) changes from the mastoid not detected, but the structure of the left mastoid diploetic type cells observed in the posterior slight thickening of the mucosa, suggesting previously recovered otitis media with low persistence. Internal auditory canal is visualized, but deformed, band-shaped, narrowed to 0.25 to 0.16 and the right from the left (Fig. 2.A). Channel deformed facial nerve on both sides, but is rendered throughout, narrowed in the mastoid section to the rear knee, and expanded in the drum (Fig. 2.B). The patient on the CT images snail, water snails and vestibule, and semicircular canals are not defined on both sides.

On the basis of complaints, anamnesis, clinical trial data, the CT examination the patient diagnosed with «bilateral congenital abnormality of the inner ear (Michel aplasia). Bilateral sensorineural deafness». However, the results do not fully explain the neurologic symptoms in patients (psychomotor retardation, neuropathy abducens right vestibular ataxia in stage subcompensation) except vestibular ataxia, which is likely due to the absence of the semicircular canals. In this regard, we have carried out an additional magnetic resonance imaging, as principle of obtaining CT images does not allow a detailed assessment of the pathology of cranial nerves in the cerebellopontine angle.

MR imaging of the cerebellopontine angle is shown in Figure 3. Similarly, the CT study on MRI images indicated the absence of structures of the inner ear (cochlea and the semicircular canals) and symmetric narrowing of the internal auditory canal on both sides.

Using MRI reconstructions was visualized area cerebellopontine angle. MRI images in the projection of the seventh and eighth cranial nerves on both sides determined by one nerve that makes it impossible to clearly differentiate them from each other. However, given that the vestibular-cochlear nerve (eighth pair) consist of a 3-ex fibers (lower and upper vestibular and cochlear nerves), and the fact that there are no organs of the inner ear, it is likely to MRI images are defined facial nerves (seventh pair). In the left cerebellopontine angle, posterior to the internal auditory canal is determined small arachnoid cysts with a clear thin capsule (size 17 x 7 mm). On the right is defined similarly arachnoid cysts, slightly invaginated into the internal auditory canal (7 x 7 mm). Also on MR images there is a lack abducens right. Left abducens the ordinary course, not changed. The absence of MRI images of the right abducens fully explain the reasons for divergent strabismus in patients surveyed on the right side.

Thus, the results of the study indicate a high informative method of CT in the diagnosis of abnormalities of the inner ear [4], as well as the possibility of using MRI to visualize the cerebellopontine angle, for the most complete explanation of the clinical picture.

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