CONTENTS

Medical sciences	
Article	
PREDICTORS OF DECOMPENSATED PLACENTAL INSUFFICIENCY AMONG WOMEN WITH CHRON INFLAMMATORY DISEASES OF UTERUS ADJUNCTS	JIC
Obukhova M. V., Yakimova A. V. BIOMECHANICAL SUBSTANTIATION OF OSSEOINTEGRATION-BASED INTRAMEDULLARY OSTEOSYNTHESIS	3
Popkov A.V., Volosnikov A.P., Kononovich N.A., Popkov D.A., Tverdokhlebov S.I., Bol'basov E.N., Shastov A.L., Shelepov A.V.	8
ABO-BLOOD GROUPS SYSTEM AND MORBIDITY	
Selezneva I.A., Gyimiyarova F.N., Gusyakova O.A., Kolotyeva N.A., Chaulin A.M., Potekhina V.I.	14
Materials of Conferences	
ANALYSIS OF SURVIVALS OF PATIENTS WITH NEWGROWTHS WITHOUT PRIMARY-DIAGNOSED FOCUS	
Beisenayeva A.R., Sirota V.B.	22
THE ROLE OF ULTRASONOGRAPHY IN DIAGNOSTICS PANCREATIC DISEASES IN CHILDREN Ulyanovskaya S.A., Bazhenov D.V., Malyavskaya S.I., Fokin A.D.	22
Short Reports	
LIPID METABOLISM IN RESPIRATORY VIRAL INFECTION BURDENING	
Solovieva N.V., Kuznetsova N.S., Zenkova T.L.	24
Historical sciences Article	
THE FEATURES OF FASHION INDUSTRY IN THE SOVIET UNION Vinichenko I.V.	26
Pedagogical sciences Article	
INTENSIFICATION OF TEACHING PROCESS OF RUSSIAN IN THE SYSTEM OF FOREIGN	
Dmitrieva D.D.	30
INSTITUTIONAL ASPECTS OF HIGHER SCHOOL MODERNIZATION	
IN CONDITIONS OF EDUCATION GLOBALIZATION Pak Yu.N., Koshebayeva G.K., Pak D.Yu.	34
Materials of Conferences	
FEATURES OF THE MODULE-RATING TECHNOLOGY IN TEACHING "CHEMISTRY" Klyuchnikova N.V., Denisova L.V.	39
UNIVERSITY E-LEARNING: DYNAMICS OF STUDENTS' ABSTRACT THINKING DEVELOPMENT Snegireva L.V.	40
Philological sciences	
Article	
ANALYTICAL CONSTRUCTION "-QY (-QI, -KY, -KI) KEL" Doskeeva B.Zh.	43



LITERARY SPACE ARCHITECTONICS IN THE NOVEL

"THE BROTHERS KARAMAZOV" BY F.M. DOSTOYEVSKY

Ogneva E.A.

2

47

Psychological sciences Article	
DIAGNOSTIC METHODS FOR DETECTION OF MANIFESTATIONS DEVIANCE-VICTIM BEHAVIOR OF TEENAGERS	
Karmanova Zh.A., Mazhenova R.B., Kadina Zh.Z., Manashova G.N.	52
Technical sciences Article	
ENGINEERING CONFECTIONING OF MATERIALS FOR GARMENTS <i>Tukhanova V.Yu., Tikhonova T.P.</i> THE HYBRID, COAXIAL, WATERPROOF STEEL CABLE WITH FIBER OPTIC AS THE 1KHZ-100 KHZ FREQUENCY SINGLE-CONDUCTOR FOR HIGH VOLTAGE AND HIGH FREQUENCY POWER SUPPLY TRANSMISSION SYSTEM FOR REMOTE CONSUMERS OF AGRICULTURAL PURPOSE	55
Yuferev L.Y., Roshin O.A., Gavrilov L.G., Esaulov V.A.	6(
Biological sciences Materials of Conferences	
NUCLIDE STRUCTURE AND THEIR CONTENT IN FRUITS OF HIPPOPHAE RHAMNOIDESH L. Hovalyg N.A., Toropova E.Yu.	6
ANALYSIS OF ENVIRONMENTAL STATUS OF THE KECHUT ARTIFICIAL RESERVOIR Simonyan A.G., Simonyan G.S., Pirumyan G.P. ANALYSIS OF ENVIRONMENTAL STATUS OF THE DIVERS SISIAN AND CODIS	6
WITH ARMENIAN INDEX OF WATER QUALITY Simonyan A.G., Pirumyan G.P.	70
WATER QUALITY ASSESSMENT "YEREVAN LAKE" ARTIFICIAL RESERVOIR Simonyan A.G., Simonyan G.S., Pirumyan G.P.	7.
ON THE SCHOOL № 45 IN ARKHANGELSK Ulyanovskiy V.A., Belova S.V.	7
Ulyanovskiy V.A., Belova S.V. Culturology Materials of Conferences	7

ETHNIC FEATURES OF ORNAMENTAL CULTURE AND TUVA ORNAMENT "KINDNESS, MUTUAL UNDERSTANDING AND WELLBEING" *Khovalyg U.A., Khovalyg1 N.A.*

73

Obukhova M.V., Yakimova A.V.

State Budget Educational Institution of Higher Professional Education Novosibirsk State Medical University of Ministry of healthcare of Russia, Novosibirsk, e-mail: m.v.obuhova@yandex.ru

One of the leading factors of perinatal death rate is placental insufficiency. Influence of pre-clinical systematic changes in female organism, related to development of placental insufficiency, opens a perspective of verifying predictors of gestation complications according to screening research of biochemical and biophysical indexes – IL-6, IL-8, IL-10, PIGF, VEGF-A. The article analyses level and dynamic of change in levels of cytokines and growth factors in blood of pregnant women with chronic inflammatory pathologies of uterus adjuncts. Conclusions on possibilities to predict placental insufficiency at early stages of pregnancy are made.

Keywords: perinatal death rate, placental insufficiency, cytokines, factors of placenta growth

Regardless of the general trend towards growth in coefficient of total birth rate, its current level in Russia remains among that of countries with the lowest value of it [5]. This situation is significantly complicated by the fact that reproductive growth of women remains unsatisfactory. Besides, regardless of certain decrease in perinatal death rate, during recent years coefficient of perinatal death rate, according to the data of 2014, remains above 8 ‰ [5].

One of the leading factors in perinatal death rate is placental insufficiency. Perinatal death rate, related to delay in embryo growth (DEG) reaches 287 ‰ [9]. DEG is registered in one third of all cases (37%) of antenatal embryo death [8]. It is known that neonatal death rate exists in direct correlation with birth body mass [7]. High perinatal death rate among such infants is related not only to prematurity, but also to placental insufficiency [6]. At the same time a special risk group is formed by children who combine prematurity and intrauterine hypotrophy. According to many authors, presence of intrauterine hypotrophy increases risk of unfavourable perinatal outcome significantly [1; 2; 3].

The main achievement of modern stage in studying pathogenesis of obstetrics complications is cardinal broadening of researchers' ideas on angiogenic imbalance and vessel disturbance that attend to early stages of placental insufficiency and associated gestational complications [10], especially for women with chronic inflammatory pathologies of uterus adjuncts.

One of the most important functions of cytokines in human organism is regulating ebryogenesis, foundation and development of immune system organs. Cytokines, produced by cells of placenta, play an important part in regulating survival and normal development of an embryo, as well as forming inborn and obtained immunity for protection against infections [4]. Besides, growth factors IL-6, IL-8 play a leading part in processes of embryo implantation and its further placentation. Revelation of pre-clinic system changes in woman organism, particularly related to development of placental insufficiency, opens perspective of verifying precursors of gestation complications according to screening research of biochemical and biophysical indexes. Reserves of decrease in severity level of gestational complications are predicting placental insufficiency and revealing its markers at early terms of gestation.

Work objective: define predictors of emergence of decompensated placental insufficiency among women with chronic inflammatory pathologies of uterine adjuncts.

Materials and methods of research

88 pregnant women were placed under observation. Average age of patients equaled 29.

Criterions of inclusion into programme of observation: early reception in female consultation, monocarpic pregnancy, chronic inflammatory pathologies of uterine adjuncts, and patient's approval of constant observation during the whole gestation period.

Depending on peculiarities of pregnancy flow and its outcome, women were divided into three clinical groups.

Contingent of the first group was formed of women with physiological flow and outcome of pregnancy. To the second group patients with chronic compensated placental insufficiency that had no effect upon embryo development, were referred. Contingent of the third group included patients with decompensated placental insufficiency: chronic intrauterine hypoxia, DED, and giving birth to children with delayed development (hypotrophy). Diagnosis of placental insufficiency was confirmed by morphological development of placenta.

Each group of women was tested with the following examinations: analysis of anamnestic data and detailed evaluation of pregnancy flow and delivery, presence and nature of complications, and also complete clinical-laboratory inspection of blood with definition of laucoformula, triple ultrasound examination with doppleometry. On week 32 of pregnancy embryo condition was evaluated with cardio-current graph examination. After delivery morphological study of placentas was made.

Ultrasound examination was made in female consultation of maternity hospital $N \ge 2$ (with apparatus "Mindray DC-7").

Prediction of placental insufficiency flow and definition of its markers among women with chronic inflammatory pathologies of uterine adjuncts at pre-clinic stage I and II was made via collecting blood samples and its examination with systems of immune-ferment analysis IL-6, IL-8, IL-10, PIGF, VEGF-A.

In order select the most informative indicators (predictors) of decompensated placental insufficiency development mathematical apparatus of ROC-analysis was used with evaluation of sensitivity and specificity of all values for the studies variables. Besides ROCcurves, the basic characteristics of each indicator were: area under ROC-curve (ROC-area), standard error of evaluating ROC-area (S.E.), probability of first type error in comparison between ROC-curve and reference line (p), and value of each indicator with the highest sensitivity and specificity.

Method of logistic regression was implemented (multiple regression with logit-transformation) in analysis of complex influence. Modeling was made with module "Nonlinear estimation" with function Quick logit regression of statistic application pack STATISTICA v. 10.0. Procedure of modeling initially included a set of the most significant predictor of all used ones. Then method of forward stepwise was used to select the second predictor and so on until classification power of model stopped to improve (according to criterion χ^2). As a result of implementing this modeling method logistic classification models of evaluating probability of placental insufficiency risk were received.

Results of research and their discussion

In prediction of placental insufficiency at early terms of pregnancy hypothesis of endothelial dysfunction according to studying growth factors represents certain interest. In this regard a great attention is paid to growth factors VEGF-A and PIGF that participate in endogenic regulation of angiogenesis.

We undertook evaluation of placental insufficiency development risk according to examination of women at the first and second trimester of pregnancy, as a result, such indexes as "sensitivity" and "specificity" for probable predictors of placental insufficiency were defined. Sensitivity characterizes part of marker carriers among women with placental insufficiency. Specificity characterizes part of healthy women who don't carry the marker.

It was revealed that the greatest significance in evaluating development of placental insufficiency as early as in the first trimester was registered for IL-6 ($0,99 \pm 0,01$; p < 0,0001). At the same time we can conclude underline that sensitivity for point 36,6 pg/ml equaled 100%, and specificity – 92%.

Besides, the following predictors were revealed as possible. For PIGF sensitivity equaled 48%, $(0,77 \pm 0,05; p < 0,0001)$. For IL-10 $(0,67 \pm 0,06; p < 0,006)$ at point 57,6 pg/ml sensitivity equaled 45%, and specificity – 94%. For WBC $(0,64 \pm 0,06; p < 0,05)$ at point 8,2·10° kl/l sensitivity equaled 70%, specificity – 60%.

In result of stepforward introduction procedure we received model, constructed upon values of IL-6, WBC, and concentration of serum albumen (Table 2). High values of IL-6 increase calculated values of placental insufficiency emergence risk, while increase in number of leucocytes and albumens has an opposite effect. The final values of statistic significance for the model of evaluating probability of placental insufficiency are characterized by $\chi^2 = 114,21$; p < 0,0001.

Table 1

Probable predictor	Area under ROC-curve \pm S.E.	р	Indicator value with max Σ	Sensitivity	Specificity
WBC	$0,64 \pm 0,06$	0,0284	8,2	70%	60%
ALBUMEN	$0,62 \pm 0,06$	0,0599	39,4	48%	75%
IL-6	$0,99 \pm 0,01$	0,0000	36,6	100%	92%
IL-8	$0,57 \pm 0,06$	0,2562	24,6	75%	54%
IL-10	$0,67 \pm 0,06$	0,0053	57,6	45%	94%
PlGF	$0,77 \pm 0,05$	0,0000	69,4	48%	100%
VEGF-A	$0,55 \pm 0,06$	0,3835	64,2	33%	96%

Results of ROC-analysis for the examined variables at the first trimester of pregnancy

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

Table 2	
---------	--

Characteristics of model	Const.B0	WBC	Albumen	IL-6
Estimate	-2,12	0,04	0,84	-0,79
Standard Error	8,36	0,48	0,50	0,43
t(84)	-0,25	0,09	1,67	-1,84
p-value	0,80	0,93	0,10	0,07
-95 % CL	-18,75	-0,92	-0,16	-1,65
+95% CL	14,51	1,01	1,84	0,07
Wald's Chi-square	0,06	0,01	2,80	3,38
p-value	0,80	0,93	0,09	0,07
Odds ratio (unit ch)	0,12	1,05	2,32	0,45
-95 % CL	0,00	0,40	0,85	0,19
+95% CL	2008840	2,74	6,31	1,07

Results of multiple logistic regression analysis among the examined women in the first trimester of pregnancy

Table 3

Specificity and sensitivity characteristics for logistic model of placental insufficiency probability according to results of examining women in the first trimester of pregnancy

Revealed	Evaluation – PI	Evaluation – no PI	Sensitivity / Specificity
Placental insufficiency	40	0	100,0%
No placental insufficiency	1	47	97,9%

For verification model with apparatus of ROC-analysis its results were very demonstrative and shown high classification efficiency of the represented model (p < 0,0001).

Table one provides results of ROC-analysis for the tested variables in the second trimester of pregnancy. Is was revealed that the greatest significance in evaluating placental insufficiency development in the second trimester was registered for IL-6, $(0,94 \pm 0,02; p < 0,0001)$. At the same time, we can outline that sensitivity at point 46,2 pg/ml equaled 98%, and specificity – 81%. The next predictor from the point of statistic significance is IL-8 ($0,86 \pm 0,04$; p < 0,0001). For IL-8 at point 44,9 pg/ml sensitivity equaled 70%, and specificity – 90%.

Table 4

Results of ROC-analysis for the studied variables in the second trimester of pregnancy

Probable predictor	Area under ROC-curve \pm S.E.	р	Index value with max Σ	Sensitivity	Specificity
PLT	$0,66 \pm 0,08$	0,0518	249,0	50%	82%
ИЛ-6	$0,94 \pm 0,02$	0,0000	46,2	98%	81%
ИЛ-8	$0,86 \pm 0,04$	0,0000	44,9	70%	90%
ИЛ-10	$0,59 \pm 0,06$	0,1471	42,3	93%	25%
PIGF	$0,53 \pm 0,06$	0,6875	247,5	60%	52%
VEGF-A	$0,51 \pm 0,06$	0,8834	76,7	28%	85%

Table 5

Results of multiple logistic regressive analysis among the examined women in the second trimester of pregnancy

Characteristics of model	Const.B0	IL-6	IL-8
Estimate	4,626217	-0,02745311	-0,06545921
Standard Error	1,035773	0,01029411	0,02311393
t(85)	4,466441	-2,666875	-2,832025
p-value	2,4323E-05	0,0091644	0,005773728
-95 % CL	2,566823	-0,04792056	-0,1114159
+95% CL	6,68561	-0,00698566	-0,01950254
Wald's Chi-square	19,94909	7,112225	8,020366
p-value	7,9804E-06	0,007659854	0,00462831
Odds ratio (unit ch)	102,127	0,9729203	0,9366372
-95 % CL	13,02439	0,9532095	0,8945667
+95% CL	800,7993	0,9930387	0,9806864
Odds ratio (range)		4,244E-07	6,56561E-13
-95% CL		7,53378E-12	1,84E-21
+95 % CL		0,02390766	0,000234612

Table 6

Characteristics of specificity and sensitivity for logistic model of placental insufficiency probability according to results of examining women in the first trimester of pregnancy

Revealed	Evaluation – PI	Evaluation – no PI	Sensitivity / Specificity
Placental insufficiency	45	3	93,8%
No placental insufficiency	9	31	77,5%

As a result of implementing procedure of stepforward inclusion we received the best model, constructed upon values of IL-6 and IL-8 (Table 5). We should outline that increase in level of the mentioned cytokines increases probability of placental insufficiency. The final values of statistic significance for model of evaluating placental insufficiency probability is characterized by $\chi^2 = 61,41$; p < 0,0001.

After verifying the model with apparatus of ROC-analysis its results proved to be quite demonstrative and shown high classification efficiency of the presented model (p < 0,0001).

Conclusion

Thus, it was established that for the first trimester among all possible predictors of placental insufficiency the greatest significance belongs to IL-6, PIGF, IL-10. Increase of IL = 6 above 36,6 pg/ml, PIGF above 69,4 pg/ml, IL-10 above 57,6 pg/ml in blood serum of patients during the first trimester of pregnancy can help us reveal risk of placental insufficiency development among them.

For the second trimester to reveal risk of clinically-significant placental insufficiency among pregnant women with chronic inflammatory diseases of uterine adjuncts predictors IL-6 (46,2 pg/ml), IL-8 (44,9 pg/ml) proved

to be the most reliable. Correspondingly growth in levels of IL-6 and IL-8 above the mentioned values can indicate risk of decompensated placental insufficiency development.

The presented conclusion defines the necessity to develop algorithm of predicting placental insufficiency at the stage of pregravidary preparation and in early terms of pregnancy. These studies can serve as perspective directions of further work on the researched topic.

References

1. Anastasieva V.G. Modern technology of preventing delivery of unhealthy children // Messenger of Kuzbas scientific center. – Kemerovo, 2007. – Issue № 4. – P. 9–14.

2. Bushtyrev V.A. Special features of adapting prematurely-born babies to extremely low delivery body mass and delay in embryo development during neonatal period // Mother and baby: materials of the VII Russian forum. – M., 2006. – P. 587–588.

3. Ignatko I.V. Preventing placental insufficiency among pregnant women of high risk group // Aspects of

gynaecology, obstetrics, and perinatology. – 2006. – Vol.5, No1. – P. 11–20.

4. Ketlinskiy S.A., Simbirtsev A.S., Cytokines. – St. Petersburgh: LLC "Izdatelstvo Foliant", 2008. – 552 p.

5. Perinatal death rate throughout subjects of Russian Federation, 2002–2014 [Digital source] URL: http://www.demoscope.ru/weekly/ssp/rus_perin.php (Application date: 09.08.2016).

6. Radzinskiy V.E., Knyazev S.A., Kostin I.N. Obstetric risk. Maximum information – minimum danger for mother and child. – M.: Exmo, 2009. – 288 p.

7. Sidelnikova V.M. Reasons of premature delivery and prevention of it // Materials of the IV summit of Russian obstetric-gynaecologists. – M., 2008. – P. 237.

8. Sorokina S.E. Evaluating efficiency of perinatal technologies // Mother and baby: materials of the VII Russian forum. – M., 2005. – P. 651–652.

9. Suverneva A.A. To the problem of Antenatal death of embryo / A.A. Suverneva, L.V. Udodova // Materials of the IV summit of Russian obstetric-gynaecologists. – M., 2008. – P. 244–245.

10. Yakimova A.V. Clinical and structural features of system "mother-placenta-embryo" in case of lungs tuberculosis // Author's abstract on dissertation for doctor of medical science / Omsk state medical academy. – Omsk, 2010. - 48 p.

BIOMECHANICAL SUBSTANTIATION OF OSSEOINTEGRATION-BASED INTRAMEDULLARY OSTEOSYNTHESIS

¹Popkov A.V., ¹Volosnikov A.P., ¹Kononovich N.A., ¹Popkov D.A., ²Tverdokhlebov S.I., ²Bol'basov E.N., ¹Shastov A.L., ¹Shelepov A.V.

¹Federal State Budgetary Institution "Russian Ilizarov Scientific Centre "Restorative Traumatology and Orthopaedics" Ministry of Health of the Russian Federation, Kurgan, e-mail: apopkov.46@mail.ru; ²National Research Tomsk Polytechnic University, Tomsk

Biomechanical studies in experimental animals demonstrated the osteosynthesis based on implant osseointegration to be the best option of intraosseous osteosynthesis for long tubular bone fractures. The assured process of osseointegration provides the implant bioactive layer in the form of hydroxyapatite. Such an approach to fracture treatment can reduce the implant thickness and weight significantly, while maintaining bone marrow and bone endosteum during surgery. The invasiveness of surgical intervention reduces abruptly, and at the same time the period of fracture consolidation shortenes up to 2–3 weeks. The strength of bone union makes it possible the longitudinal loading of bone above 180 kg.

Keywords: intramedullary osteosynthesis, hydroxyapatite coating, osseointegration

In well-developed countries, at the background of a continuous growth in injury rate, development of medical technology is mainly related to implementation of implants, produced of materials that have become called biocompatible (metals, ceramics, polymers). Most frequently traumatology uses metal bone and intraosteal implants. Within philosophy of AO/ASIF a wide range of various plates and pins for bone an intraosteal osteosynthesis of different bone areas has been developed as well as an original toolset. A great attention is devoted to solidity of the very fixator, as it receives all the strain before bone splinters are consolidated (several months).

During the recent years it has been recommended to treat diaphyseal fractures with implementation of intramedullary elastic pins with 2–4 mm of thickness, including those with bioactive covering [5, 8]. According to authors, it can stimulate reparative osteogenesis and reduce period of fracture union 2–4 times

The objective of this research is to explain the necessity of an implant osteointegration into bone-marrow channel for reduction in bone fracture consolidation period.

Materials and methods of research

Two series of experiments have been undertaken on mature breedless dogs of both sexes with body mass $20 \pm 2,9$ kgs. For the first series (n = 12) narcotized animals were exposed to intramedullary reinforcement of tibial bone with pin, made of titan alloy (Ti6A1 4V) 1,8mm thick, covered with hydroxyapatite (HA). After it fracture of bone diaphysis was modeled, and osteosynthesis with apparatus of Ilizarov was undertaken.

The animals were observed for 14–180 days after the surgery. Fracture union was defined according to roentgenologic indications and results of clinical sample. For clinical sample we removed the pins that were connected subsystems of Ilisarov apparatus, and splinters were then exposed to rotation and flexion strain. Lack of pathological mobility in the area of osteotomy was defined as criterion of union formation, and Illizarov apparatus was removed on that day. Pins that had been introduced into bone-marrow channel, were not removed during lifetime observations over animals.

Analysis of fracture union solidity was done according to biomechanical research at a special workbench, where the studied bone was strained with diametrical bending force from 1 to kgs. Degree of bone elastic bending was measured with micrometer of watch type – (IC25 class 1 GOST 577-68 GRIFF 017911, Russia) with evaluation accuracy $\pm 0,01$ mm.

For the second series (n = 5) we tested degree of osteointegration for intramedullary pins with bioactive cover, received via different technologies [10]. For that in each case one pin was placed intramedullary without fracture modeling and fixed for 4 weeks. After it the pin was removed with evaluation of tear off force with dynamometer DEPZ-1D-1U-1 (Russia) that has tension-resistance sensors that provide for evaluation accuracy $\pm 0,01N$ (animals were placed under narcosis, euthanasia was not implemented). Calculation of pin tear off force (*P*) was made according to the formula:

$$P = \frac{F}{L\pi d},$$

while *F* is tearoff force; *L* is pin length; *d* is pin diameter. Statistic procession of quantitative data was made with implementation of paired binary t-test (p < 0.05) and criterion of Wilkinson for independent selections (p < 0.05).

The experiments were undertaken in accordance with "European convention on protection of vertebrate animals, used for experimental and other scientific purposes" (Strasbourg, 1986) and approved by Committee of ethics in Federal state budget institution "Russian scientific center "Recreational traumatology and orthopaedics" of academy member G.A. Ilizarov".

Results of research and their discussion

During the experiment no oscillations in food and water consumption has been registered among the animals within clinical observation. Complications of neurological or infection nature did not happen. Supporting function of the tested segment preserved during the whole period of experiment. During the whole test intramedullary pins remains fixed, no shift in their position was registered.

Roentgenologic union of fracture came in 2–3 weeks of osteosynthesis. Our morphological research, published earlier, as well as computer to-mography [7] confirms that a bone case is formed around intramedullary pin due to induced local osteogenesis (Fig. 1, *b*). Thickness of the mineralized wall in this "case" can reach 3 mm, and fur-

ther it links firmly to endostome and bone-marrow channel is filled with spongy bone along the whole length of intramedullary pin (Fig. 1, a, c). This so-called bone "pin" provides for stability of bone splinters, quick consolidation of fracture, and possibility of complete strain upon the damaged limb for soon as one month after the surgery.

The results of tear of test for intramedullary located implants are presented in Table.



Fig. 1. Preparations of tibial bone of a dog:

a – in diametrials cut of wet preparation we can see that bone-marrow channel is filled completely with spongy substance of bone tissue; b – in diametrical cut of bone preparation after dissolution of organic component with spirit-ether composition (patent RFN 2495567) we can see a clear "case" of local bone formation around intramedullary pin that is connected firmly to endosteel surface with trabecules; c – along the whole length of intramedullary pin we can see a formed bone "pin" – spongy substance of bone that has filled bone-marrow channel completely (trough spongy bone intramedullary pin is visible), the arrow points to a.nutricia (cortical layer is partially removed)

Technology of pin GA covering	Pin length (mm)	Pin di- ameter (mm)	Tearoff ef- fort (H)	Pin surface area (mm ²)	Tearoff ef- fort (GPa)
1. Steel + (polylactide, mixed with hydroxyapatite)	$44,25 \pm 7,2$	1	$36,725 \pm 2$	138,72 ± 23,08	353,6 ± 11
2. Steel + Ti (titan layer + prim- er) + GA (microarc oxidation) + GA (high-frequency magnetron dispersion)	60,66 ± 0,1	1,6	95,1 ± 4	304,79 ± 4,74	$312,2 \pm 20$
3. Steel + Ti (titan layer-primer) + ΓA (high-frequency magnetron dispersion)	70,0 ± 17,8	1,4	126 ± 4	307,72 ± 78,22	421,0 ± 17
4. Steel + ΓA GA (high-frequency magnetron dispersion)	70,0 ± 13,5	1,8	203,5 ± 9	396,1 ± 76,0	400,6 ± 27
5. Titan + GA (microarc oxidation)	$81,75 \pm 22,3$	2	$258,9 \pm 9$	$513,3 \pm 76,53$	$494,7 \pm 28$
6. Steel + (solopolimer of tetraphto- retilene with vinilidenphtorite, mixed with hydroxyapatite)	71,4 ± 18,4	2	219,6 ± 7	419,2 ± 115,59	514 ± 20
7. Steel	$75,0 \pm 8,2$	1,6	$14,09 \pm 5$	$393,5 \pm 41,02$	$351,1 \pm 18$

Level of effort during tearoff for pins with GA covering, layed via different technologies

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

Test results show us that the least tearoff effort is typical for steel pins without covering (N_{2} 7). The formed microporous calcium-phosphate layer at the surface of pins, produced of titan (technology-5) improves indexes of connection to the surrounding tissue by more than 140% in comparison to pins without covering. Steel implants with composite signet-electric biologically-active covering (technology-6) with copolymer VDF-TeFE contents 35% have shown stability of connection with bone tissue at a similar level as titan pins with covering, produced according to technology MDO.

Solidity of fracture union was defined with bench tests via exposing the damaged bone to bending strain. Clinical probe has shown lack of any bone fragment motion in the area of fracture. During the research at special bench (Fig. 2), when the bone was exposed to diametrical strain with effort from 1 to 8 kgs, degree of elastic bone bend did not exceed 0,6 mm.

We have undertaken evaluation test of maximum allowed effort upon a dog limb under intramedullary osteosynthesis of tibial bone with titan pin surfaced with bioactive covering after removing apparatus of Ilizarov. A number of allowances were made in calculation. Bone material was conditionally acknowledged as homogeneous, whole, and isotropic. It was considered that a "case", formed around the pin from spongy bone substance, is connected with equal firmness to cortical bone layer and pin. Section of bone-marrow channel was acknowledged as round. Solidity limit for tension and contraction of spongy bone tissue was taken as $\sigma = 6,2$ MPa, and elasticity module was taken as E = 200 MPa [1], module of pin material elasticity – 400 MPa [2]. The allowed tangent tension of spongy bone tissue was taken as 3,4 MPa according to condition

$$[t] = 0.55 \cdot [\sigma].$$

Fig. 3 presents scheme of strain upon dog limb during tread that was used in calculation.

Under the impact of strain P in the area of fracture several types of tension emerge, such as tension of contraction, bending, and shift. Scheme of fracture area strain under contraction is presented in Fig. 4, a.

Contraction of fracture area takes place in longitudinal component F from effort P that was defined according to condition $F = P \cdot \cos \alpha$. In spongy bone substance tangent and normal tension emerges, it causes cut and contraction.

Tangent strain was defined through equation:

$$t = F/S$$

while *F* is longitudinal component of force *P*;

$$S = c \cdot \pi \cdot d_2 = 1,4 \text{ sm}^2$$

is the area of cut surface. A dangerous surface for cutting was considered area of contact between bone post and pin (area B, Fig. 4, a), as there area of contact is smaller than area of



Fig. 2. Scheme of effort, test bench (picture), graph of dependence between bone shift and bending effort

10

contact between bone post with cortical layer (area A, Fig. 4, a). Utmost allowed strain upon the cut in the area of pin contact:

$$F = [t] \cdot S = 48$$
 kgs.

For the area of contact between bone "pin" with compact bone substance area of cut surface was defined as $S = 18,8 \text{ sm}^2$, utmost allowed strain upon cut equals F = 640 kgs.

Normal strains were defined from equation

$$\sigma = F/S_1,$$

while S_1 is the area of bone "pin" cut.

$$S_1 = \pi \cdot r^2 - S_2,$$

while r is radius of bone "pin" 10 mm, and

$$S_2 = \pi \cdot r^2$$

is area of pin cut (r is pinъ radius 0,75 mm). Utmost allowed strain of contraction:

$$F = [\sigma] \cdot S_1 = 193 \text{ kgs}$$

Criterion of fracture place solidity for general strain upon limb P is defined as utmost allowed strain of contraction for bone post. When this strain is achieved, collapse of bone post and its cut off will take place under the impact of longitudinal force component. Utmost effort upon the limb equals P = 205 kgs.



Fig. 3. Schemes:

a – strain upon animal limb during tread, while *P* is supporting strain upon limb; *N* is diametrical component of force *P*; *F* is longitudinal component of force *P*; *L* is arm of N force impact, acknowledged as 10 sm for calculations; α is angle of limb oscillation during vertical tread, acknowledged as 20° for calculations;

b – scheme of bone fracture area: A is pin, B is spongy bone (bone post), C is cortical layer, D is bone regenerate, d_1 isdiameter of bone post; acknowledged as 2 sm for calculations, d_2 is pin diameter, acknowledged as 0,15 sm for calculations, e is length of bone post, acknowledged as 6 sm for calculations, c is length of contact area between bone post with cortical layer of bone fragment, above and beneath fracture, acknowledged as 3 sm for calculations, h is fracture area



Fig. 4. Scheme of fracture area strain with longitudinal effort (a); bending diametrical force (b)

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

Bending of fracture area (Fig. 4, b) takes place under the impact of diametrical component N of effort P that creates bending momentum

$$M = N \cdot L,$$

while $N = P \cdot \sin \alpha$.

In diametrical cut impact of bending momentum M creates tension of stretching and contraction. Normal tensions in case of bone post ("pin", "case") bending are

$$\sigma_1 = M \cdot r / J_1 [9],$$

normal tensions in case of pin bending are

$$\sigma_2 = M \cdot r / J_2,$$

while *r* is bone "pin" radius, or pin radius is used in corresponding equations, J_1J_2 are inertia momentums of cut area for bone post and pin correspondingly.

$$J_1 = 0.05 d_1^4 \left(1 - \left(\frac{d_2}{d_1} \right) \right)^4 = 8000 \text{ mm}^4$$

for bone post,

$$J_2 = 0.05 d_2^4 = 0.25 \text{ mm}^4$$

for pin. Utmost allowed bending effort for bone substance is

$$N_1 = \sigma_1 \cdot J_1 / L \cdot r = 4.9$$
 kgs;

for pin bending

$$N_2 = \sigma_2 \cdot J_2 / L \cdot r = 0.13$$
 kgs.

As the dangerous cut contains materials with different characteristics, equation of calculating two-layer beam bending was implemented: for bone "case"

$$\sigma_1 = M \cdot r \cdot E_1 / (E_1 \cdot J_1 + E_2 \cdot J_2);$$

for pin

$$\sigma_2 = M \cdot r \cdot E_2 / (E_1 \cdot J_1 + E_2 \cdot J_2).$$

Effort that creates critical internal tension under bending was calculated: for bone substance:

$$N_1 = [\sigma_1] \cdot (E_1 \cdot J_1 + E_2 \cdot J_2) / L \cdot r \cdot E_1 = 5,4 \text{ kgs};$$

for pin:

$$N_2 = [\sigma_2] \cdot (E_1 \cdot J_1 + E_2 \cdot J_2) / L \cdot r \cdot E_2 = 7,7$$
 kgs.

Therefore, under the impact of effort P critical values of internal tension will take place in spongy bone from diametrical component of N that bends the bone. Criterion of fracture area solidity was considered as the minimal of utmost allowed forces that create effort P, in other words, bending force N 5,4 kgs that impacts bone post and can emerge under the allowed force P = 15,7 kgs.

The basic principle of modern bone and intraosteal osteosynthesis is mechanical positioning of damaged bone fragments in fixed condition until complete recovery.

Combined osteosynthesis of fractures in long tubular bones with apparatus of Ilizarov and intramedullary pins with GA covering has demonstrated us the possibility of bone union in clinical conditions in 3–4 weeks. It is known that hydroxyapatite covering induce bone formation around an implant and thus provides for larger area of contact between the pin and damaged bone, improving its fixation practically without any gaps between bone and implant [9].

The basic objective of research, related to implementing implants in orthopaedics and surgical stomatology is achieving the corresponding implant fixation in the surrounding bone. Evaluation of fixation degree is preferably performed with mechanical tests that allow researchers to receive quantitative indications [3]. Nowadays evaluation of mechanical characteristics of extracted implants is made via different methods. Tests for ejection and tearoff are simple and can be performed with cheap equipment [6]. After T. Nakamura developed an original method of tearing off an implant with bioactive surface from bone bed in 1985, several researchers of Kioto university have undertaken this test to evaluate firmness of connection between bone and various biomaterials, such as bioactive ceramic, titan alloy, covered with bioactive materials, chemically and thermally processed titan [4]. Their experiments demonstrated that connection between bone and implant increased with time for all materials except for clear titan. The highest level of implant tearoff was observed during implementation of glass-ceramic and, as well as in our research, dense hydroaxyapatite – around 80 newton, but only in 24 weeks of fixation and for contact area around 150 mm².

According to technology of osteosynthesis and biomechanical conditions that are created in the area of fracture, all implants can be divided into static and dynamic. For static (shunt) osteosynthesis the most of strain lays upon fixator. It leads to a number of negative effects: osteoporosis in not-strained area of bone, decrease in efficiency of osteosurgery in the area of fracture, and also increase in risk of implant and bolt collapse. Dynamic osteosynthesis that is usually implemented in the second half

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

of treatment process (after several months, when slow consolidation is diagnosed), allows specialists to distribute strain between fixator and bone thus stimulating reparative ostheosynthesis in fracture area. Degree of strain distribution depends on a number of conditions and is not regulated in process of practical implementation.

From our point of view exclusion of all unfavourable conditions for union during osteosynthesis can take place in case of maximal osteointegration of implant, and it requires increase in their biological activity. Even such insignificant in it diameter intramedullary implant as a pin with GA covering establishes optimal conditions for fracture consolidation in 2–3 weeks [7]. At the same time, solidity of connection between the pin and bone endostome can endure tearoff tension over 500 GPa.

Mathematical calculations show us that criterion of fracture area stability against impact of force P upon a limb is utmost allowed bending effort. In our case safe effort upon the limb after 2 weeks of osteosynthesis, provided by bone post and pin, equaled 15,7 kgs. The formed bone case (post) covered the area of bone fracture and provided for increase in so-lidity of bone in this area, established limb supportability at the final stage of fracture union.

For an experimental animal, in our case – a dog weighed around 20 kgs, which weight is distributed between 4 limbs during calm tread (5 kgs per limb), effort is 2 times lower than allowed, and for clam walk on 2 limbs (10 kgs each) it is also lower than allowed. In this regard we observed no limb deformations after removal of Ilizarov apparatus even so soon as 2 weeks after the surgery.

If we undertake biomechanical calculations for human bone, we can see that with implementation of a combined osteosynthesis with intramedullary bioactive implant a traumatologist can expect solidity of shin consolidation for a patient even in case of early removal of Ilizarov apparatus against longitudinal strain above 180 kgs, and stability against cut above 100 kgs. Bending effort with force close to 39 kgs can result in secondary fracture, therefore, additional preventive immobilization of the damaged segment is possible in shape of orthesis that will reinforce the limb and increase the allowed strain upon it, resisting bending.

Conclusion

An optimal method of intraosteal osteosynthesis for fractures of long tubular bones is osteosynthesis at the foundation of implant osteointegration. A guaranteed process of osteointegration establishes bioactive layer at the surface of implant in shape of hydroaxyapatite. Such approach towards fracture treatment allows for a significant decrease in width and mass of an implant, thus preserving marrow and bone endosteum during surgery. Injury rate during surgery is decreased significantly and, at the same time, time period, required for fracture consolidation, decreases down to 2-4 weeks. Solidity of bone union allows for longitudinal strain upon limb more than 180 kg.

Research material is prepared with financial support of Russian scientific fund (project $N_{\rm P}$ 16-15-00176).

References

1. Begun P.I., Afonin P.N. Modeling in biomechanics. – M.: High school, 2004. – 391 p.

2. Ftodosieva V.I. Resistance of materials: textbook for universities. Ed. 10, reveiewed and enriched. – M.: Moscow state technical university of N.E. Bauman, 1999. – Vol. 2. – 595 p.

3. Barrere F., van der Valk C.M., Dalmeijer R.A. et al. Osteogenecity of octacalcium phosphate coatings applied on porous metal implants // J. Biomed. Mater. Res. -2003. -Vol. 66A. - P. 779–788.

4. Fujibayashi S., Nakamura T., Nishiguchi S. et al. Bioactive titanium: effect of sodium removal on the bone-bonding ability of bioactive titanium prepared by alkali and heat treatment // J. Biomed. Mater. Res. -2001. - Vol. 56. - P. 562-570.

5. Lascombes P. Embrochage centromedullaire elastique staible. – Elsevier, 2006. – 321 p.

6. Nakamura T., Yamamuro T., Higashi S. et al. A new glassceramic for bone replacement: evaluation of its bonding to bone tissue // J. Biomed. Mater. Res. - 1985. - Vol. 19. - P. 685–698.

7. Popkov A.V., Kononovich N.A., Gorbach E.N., Tverdokhlebov S.I., Irianov Y.M., Popkov D.A. Bone Healing by Using Ilizarov External Fixation Combined with Flexible Intramedullary Nailing versus Ilizarov External Fixation Alone in the Repair of Tibial Shaft Fractures: Experimental Study. ScientificWorldJournal. 2014;2014:239791. doi: 10.1155/2014/239791. Epub 2014 Oct 14.

8. Popkov D. Combined Stimulating Methods Reconstructive Sugery in Pediatric Orthopedics. – New York, 2015. – 174 p.

9. Søballe K., Overgaard S. The current status of hydroxyapatite coating of prostheses // J. Bone Jt Surg. (Br). – 1996. – Vol. 78. – P. 689–691.

10. Tverdokhlebov S.I., Bolbasov E.N., Shesterikov E.V., Malchikhina A.I., Novikov V.A., Anissimov Y.G. Research of the surface properties of the thermoplastic copolymer of Vinilidene Fluoride and Tetrafluoroethylene modified with radio-frequency magnetron sputtering for medical application // Applied surface science. – 2012 – Vol. 263 – P. 187–194.

ABO-BLOOD GROUPS SYSTEM AND MORBIDITY

Selezneva I.A., Gylmiyarova F.N., Gusyakova O.A., Kolotyeva N.A.,

Chaulin A.M., Potekhina V.I.

Samara State Medical University, Samara, e-mail:bio-sam@yandex.ru

Peculiarities of metabolic profile and blood cell composition were studied on the basis of the examination of clinically healthy individuals with 0 (I) - AB (IV) blood groups. It was shown that the majority of molecular processes were associated with genetically determined group affiliation of the blood, the specifics of which can serve as a prerequisite for the formation of different health quality. The obtained data can be the basis for creating the individual health passport based on a personalized indicator of the AB0blood groups.

Keywords: AB0blood groups, cellular composition of the blood, metabolism, blood group associated diseases

Nowadays to justify an individual approach to the diagnosis and treatment of diseases in personalized medicine it is necessary to find objective criteria for the state of molecular processes genetically. There is an evidence that such external markers are stable during the life and can be considered as a unique variety and a unique combination of blood groups for the livelihoods of the human body [1, 2, 3, 4, 5, 6]7, 8]. It is known, that the AB0 blood group system consists of two agglutinogens, which are presented on red blood cells, and two corresponding agglutinins in plasma – anti-A and anti-B. Group antigens are the foundation of a balanced polymorphism, one of the main cell structure "architects" in our body; blood plasma is the red blood cells external environment. which interacts with individual and unique topographical collection of glyco – and lipoproteins in the cytoplasmic membrane of each population of red blood cells and can affect their physical and chemical interactions. We studied the peculiarities of the metabolism and cellular composition of blood for each AB0 blood group, and the blood group associated diseases [9, 10, 11].

Materials and methods of research

The research was conducted at the department of fundamental and clinical biochemistry with laboratory diagnostic of Samara State Medical University and in the Samara State Medical University Clinics. We analyzed the 40 parameters of protein, carbohydrate, lipid metabolism and cell composition of the blood at the 21 setting on the clinical material more than 180,000 donations. Material for the study was venous blood.

AB0 blood groups were determined by the cross method and using monoclonal antibodies anti-A, anti-B, anti-AB by direct agglutination in the plane with an automated analyzer for conducting immune hematological studies "Chemosil SP" II company BIO-Rad, reagents TransCloneAnti-AB01 (A), TransCloneAnti-AB02 (B), TransCloneAnti-AB03 (AB) (Bio-Rad, USA). Distribution of the blood group were as following: 0 (I) blood group was 29,6%, A(II) blood group was 31,8%, B(III) blood group - 24,3%, AB (IV) blood group was 14,3%.

General blood analysis was performed on an automatic Hematology analyzer "Sysmex KX - 21", "SysmexXT 2000i" (Japan) using a commercial set of reagents firm "Roch-Diagnostics" (Japan). Expanded differential count leukocyte formula was performed in stained blood preparations using light microscope "Zeiss". The erythrocyte sedimentation rate was determined by the unified Panchenkov method.

Biochemical studies were performed on the automatic biochemical analyzer "Hitachi – 902" (Roch-Diagnostics, Japan), Cobas Integra 400 plus (Roche Diagnostics, Japan), "BIOSEN C_line" (Germany). The concentration of sodium, potassium, chloride were determined by ion-selective method. Analysis of protein fractions was carried out on the apparatus for electrophoresis "Astra" (Russia). Quality control was carried out using control sera of two levels of "Precinorm", "Precipat" company "Roch-Diagnostics" (Switzerland) with the construction of control charts and application of the Westgard criteria.

Statistical processing of the results was performed using the statistical package SPSS12.0 and MicrosoftExcel 2010.

Results of research and their discussion

The obtained results indicate the biological variability of cellular and molecular composition of AB0 blood groups [12]. It was found that individuals with O(I) blood group had lower number of erythrocytes comparing to the general population and other blood groups (Me $5,17\cdot10^{12}/l$ with relatively small average cell volume (Me 85.50 fl). Men with the 0(I) blood group had the lowest level of hemoglobin (Me 146,50 g/l). The intensity of hemoglobin synthesis was maximum (Me -33,90 g/dl). The hemoglobin content in the blood is one of the most conservative constants, not changing for long periods. Thus, at relatively low number of erythrocytes and the majority of cells in the average size, the full exchange of blood gases is possible due to fairly high degree of cells saturation with hemoglobin (Me -29,10 pg).

In the evaluation of blood serum total protein and protein spectrum of the patients with O(I) blood group the tendency to lower content of albumin (Me50,8%) comparing to the

other blood groups drew attention: patients with A(II) - 52,7%; B(III) is 54,3%; AB(IV) -53,6%. It is characteristic that the percentage of $\alpha 1$, $\alpha 2$, β -globulins was greater than the median in A(II)-AB(IV) blood groups: 3,93; 16,16 and 10,89% respectively. In addition, we noticed a high level of γ -globulin – Me 19,07%, due to that the albumin-globulin ratio had the lowest value. The content of Creactive protein and other studied metabolic parameters were within the reference values. confirming the adequacy of the formed control groups, i.e. clinically healthy individuals. However, for patients with 0(I) blood group in the "gray zone" this parameter (Me 3,02 mg/l) was significantly higher than in the other blood groups. Relatively high values of IgA (Me 3,60 g/l), IgG (Me of 11,55 g/l) complement the specificity of the protein spectrum of patients with 0(I) blood group - reduced content of fine albumins and an increase of particulate protein fractions of globulins.

We found that the blood serum of patients with O(I) blood group had the lowest comparing to the other blood groups glucose concentration (Me 3,8 mmol/l), magnesium (Me 0,82 mmol/l), calcium (Me 2,14 mmol/l) and iron (Me 16,8 µmol/l). Low iron levels can be

the basis for studying the risk of developing iron-deficient conditions, assessment of this factor as a predictor of the development of iron deficiency conditions.

Men and especially women with the 0(I) blood group had relatively low compared to the other blood groups the leucocytes level: Me 6,00·10⁹/l and 5,85·10⁹/l, respectively. The absolute content of neutrophils was sufficient; women had the lowest concentration of lymphocytes (Me 32%).

There is the literature based information about the connection 0 (I) blood group with some diseases, such as gastric ulcer and duodenal ulcer, gastritis, gastric cancer, dysplasia (Table 1). The team of the biochemistry chair received information about the anemia in hemophilic patients with 0(I) blood group [13, 14]. From Table 1 it follows that patients with 0 (I) blood group have a preferential relationship with somatic pathology. It is possibly depends on the characteristics of metabolism the tendency to leukopenia, lymphocytopenia with relatively high concentrations of CRP, IgA, IgG. Apparently, this is the evidence of immunological memory to previous antigenantibody interactions and lower potential immunological regulatory cellular link.

Possibility of pathological process development	Authors
Peptic ulcer disease	U. Altuhov (1983) [15], G. Drannik, G. Dizik (1990) [1], A. Tananyan (2001) [16], S. Garmonov et al. (2004) [17], N.N. Bogdanov (2012) [18]
Stomach cancer	B. Bjorkholm et al (2001) [19], M. Aspholm-Hurtig et al (2006) [20]
Hip joint dysplasia	I. Taboridze (1991) [21]
Myasthenia	B. Gehte(1995) [22]
Mutation (F7)	T. Subbotina (2012) [23]
Women papillomavirus infection Acute inflammatory processes in women reproductive system	E. Shevchenko (2010) [5]
Sympathetic oftalmia	L. Arkhipova (2012) [24]
Hemophilicpatient sanemia	U. Kosyakova, F. Gilmiarova (2015) [13]
Chronic prostatitis with benign prostatic hyperplasia	M. Shatohin, A. Konoplya, C.A. Dolgareva, (2011) [25]
Bladder cancer	I. Mayskov, (2013) [26]
The increased spontaneous platelet ag- gregation	E. Gergesova, (2011) [27]
Chronic heart disease	S. Biswas, P.K. Ghoshal, B. Halder, N. Mandal (2013) [28]

Link between blood groups 0(I) and diseases

Table 1

Clinically healthy examined people with A (II) blood group are characterized by the following features. It is established that they have a high level of triglycerides (Me 1,41 mmol/l), relatively low content of high density lipoprotein (Me 1,33 mmol/l) and higher content of low density lipoproteins (Me of 2,76 mmol/l) than in 0(I) and AB(IV) blood groups and, consequently, the high coefficient of atherogenicity. The level of lipid carriers A (II) blood can be roughly attributed to the lipid type. The content of total cholesterol by the median corresponds to the data in the General population (4,9 mmol/L). In addition, we noticed the low level of albumin (Me 40,8 g/l), which plays an important role in providing colloid osmotic homeostasis of blood, transport of exogenous and endogenous xenobiotics, fatty acids, trace elements.

Women with A (II) blood group had the highest content of erythrocytes compared with other blood groups – Me $4,55 \cdot 10^{12}$ /L. Along with this, men had minimal relative to other blood groups the average volume of red blood cells – Me 85,20 fl. It is characteristic that the

average content of hemoglobin in one erythrocyte (Me of 28,65 pg) is less than the level in individuals with other blood groups. The erythrocyte sedimentation rate for women was higher comparing with the general population and with 0(I) blood group - Me 5 mm/h. Perhaps the uniformity of the volume of red blood cells, a sufficiently high coarse protein content - γ -globulin – is a significant factor in this process. Blood parameters in women of this blood group are also characterized by the highest content of leukocytes (Me 7,20 \cdot 10⁹/l), the absolute content of neutrophils (Me 3,65·10³/ml) higher, and the stab neutrophils (Me 2%) lower than individuals with other blood groups. There is a tendency for women with A (II) blood group to the appealing small platelets (Me MPV 10,20 fl), functionally less complete than large cells. Men with A (II) blood group compared with other blood groups are characterized by the largest absolute content of lymphocytes – Me $2,40 \cdot 10^3$ /ml.

There are the most common diseases for the patients with A (II) blood groups indicated in the Table 2.

Table 2

Possibility of pathological process development	Authors
Atherosclerosis of lower extremities	S. Chubar (1980) [29],
Rheumatic diseases	E. Meshalkin (1981) [30],
	M. Freidin et al. (2006) [31], E. Suslova (2012) [32]
Chronic heart disease	M. Rafalovich et al. (1982) [33]
Bronchial asthma	E. Chichenko, U. Koshel (1975) [34]
Cholecystitis, cholelithiasis	G. Dizik et al (1982) [35]
Meningococcal infection Secondary purulent	U. Rudometov et al. (1981) [36]
meningitis	
Leiden mutation (F5)	I. Danilov (2010) [37]
Protrombin mutation (F2)	
Platelet receptors mutation (GpIa,GpIIIa)	R. Vitkovskiy E. Gergesova (2011) [38]
HIV, The combined prevalence of HIV, Hepati-	F. Gilmiyarova, V. Radomskaya et al. (2007) [12]
tis C, Hepatitis B, Preeclampsia and fetal hypo-	
trophy, Iron deficiency anemia, Onychomycosis,	
Chronic generalized periodontitis, Helicobacter	
pylori antibodies in oral fluid	
Chronic prostatitis	M. Shatohin, A. Konoplya (2011) [25]
The combination of chronic prostatitis with be-	M. Shatohin, A. Konoplya(2011) [25]
nign prostatic hyperplasia	
Breast cancer	M. Yanchenko (2011) [39]
Tuberculosis	M. Bektasova, V. Kapcov (2014) [40]
Atherosclerosis with complications	E. Suslova, L. Vasilyeva (2012) [32]
Appendicular peritonitis in children	V. Gavrilyuk (2011) [41]
Hemolytic disease of the newborn with A-blood	B. Doyle, J. Quigley et al. (2014) [42]
group mothers	
Pancreatic cancer	C. Rizzato, D. Campa et al. (2013) [43]
Gastroesophageal reflux disease	M. Sadreddini, Y. Rasmi et al. (2011) [44]

Link between blood groups A (II) and diseases

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

From Table 2 follows that for persons with A (II) blood group are common infectious diseases, such as viral hepatitis B and C, HIV infection. We found it possible to associate it with features of metabolic and cellular composition of the blood: a tendency to lymphocytosis in this patients are visualized with hypergammaglobulinemia (y-globulin Me of 19,59%) and higher concentration of immunoglobulin G (Me of 11,56 g/l), as a reflection of the earlier response, immune response, immunological memory of old and fresh contacts with bacterial and viral agents. Apparently, the structure of agglutinogen A is similar to the antigenic structure of many bacterial and viral agents, and we can observe the phenomenon of "antigenic mimicry" when antigen penetrating to the body do not cause an immune response.

Patients with B (III) blood group are identified with low total protein level (Me 71,6 g/l) relatively to the general population level and persons with other blood groups. They are characterized by a low percentage of $\alpha 1$ – (Me 3,45%), β-globulin (Me 14,85%), IgA (Me 2,76 g/l), IgM (Me 0,84 g/l), IgG (Me of 11,01 g/l); the concentration of albumin exceed the level in the other groups (Me 54,3%). There are some specificities of the lipid spectrum: the highest concentration of high-density lipoproteins (Me 1,45 mmol/l) and low-density lipoprotein (Me of 2,81 mmol/l); also we can notice a sufficiently high concentration of the general serum cholesterol of blood (Me 5,1 mmol/l), which is higher than in the general population and all other patients. Characterized by the highest supply of magnesium (Me 0,93 mmol/l) and calcium (Me 2,36 mmol/l), which is quite physiological with association of significant albumin content (Me 54,3%). The tendency to decreasing an iron content is similar to persons with A (II) blood group: they are determined by the lowest values – Me 16,80 µmol/L.

For men with (III) blood group it was discovered the highest number of erythrocytes (Me of 5,29·10¹²/l), average volume (Me 86,85 fl), hematocrit (Me of 45,85%), significantly increased the content of hemoglobin in the blood (Me 158,50 g/l; p < 0,05) in one erythrocyte (Me 30,15 pg; p < 0,05) comparing with 0 (I), A (II), AB(IV) blood groups. Women had the lowest number of erythrocytes (Me of 4,40·10¹²/l) hematocrit (Me 38,6%), the content of hemoglobin in the blood (Me 129 g/l) in one erythrocyte (Me 29,2 PG). The erythrocyte sedimentation rate in men (Me 2 mm/h; p < 0,05) was significantly lower in 2 times than the female B (III) blood group (Me 4 mm/h). In addition, compared with O (I), A (II), AB (IV) blood groups revealed a number of features in males: the highest number of leukocytes (Me $6,7\cdot10^{9}/l$) due to a more considerable Fund of neutrophils (Me 56,35%). The absolute content of neutrophils is also at the highest level – Me $3,75\cdot10^{3}/ml$, and the relative number of lymphocytes characterized by the lowest rate – Me of 32,5%. Men with this blood group had the highest average volume of platelets (Me 11,4 fl), the average width of the distribution of platelets in volume (Me 14,9%), significantly increased the content of monocytes (9,0%; p < 0,05).

Table 3 shows data on associated with B (III) blood group diseases. It is clearly visible that this blood group is associated with a minimal amount of diseases. We identified that individuals with blood group B (III) are characterized by a minimal risk of developing preeclampsia, polyploidy, fetal malnutrition [12, 45]. Cellular blood composition of patients with B (III) blood group is characterized by severe quantitative and qualitative features, but in general we tend to believe that there are prerequisites for good health.

The blood of clinically healthy individuals with the AB (IV) blood group is characterized by a high content of total protein (Me 75,3 g/l), albumin (Me of 4.9 g/l), and the concentration of C-reactive protein in trace amounts (Me 0,9 mg/l), reflecting the lack of response to exogenous and endogenous pathogens, products of damaged tissues, atherosclerotic process. The amount of cholesterol (Me 4,6 mmol/l) and triglycerides (Me 0,96 mmol/l) were minimal. Providing tissues and organs with lipids, primarily cholesterol, unsaturated higher fatty acids, low density lipoproteins and destruction in the composition of lipoproteins of high density, obviously, balanced interconversions of lipoproteins, transport of lipid components to extrahepatic tissues to the liver, as evidenced by rather high content of lipoproteins of high density (Me of 1,42 mmol/l). Magnesium concentration (Me of 0.84 mmol/l) was similar to persons with A (II) blood group, which could serve as a prerequisite for the disorders of energy production in the body.

Based on the studied parameters of cellular blood composition in women with AB (IV) blood group it was revealed that they had 2 times more significant features than in men. They are characterized by a high content of erythrocytes – Me $4,54\cdot10^{12}/l$, the average volume is rather small – Me 87,20 fl, they are homogeneous according to this indicator, as evidenced by the small width of their distribution

Possibility of pathological process development	Authors	
Pneumonia Postoperative infection	M. Averbah (1985) [46]	
Osteochondrosis with radicular syndrome	G. Drannik (1990) [1]	
Sciatica		
MGTFR mutation	T. Subbotina (2012) [23]	
Chronic inflammatory processes in women repro-	E. Shevchenko (2010) [5]	
ductive system		
Damage of the coronary artery associated with	K. Jamamura (2012) [47]	
Kawasaki disease		
Chronic prostatitis	M. Shatohin, A. Konoplya (2011) [25]	
The combination of chronic obstructive bronchi-	E. Suslova, L. Vasilyeva (2013) [48]	
tis with coronary heart disease		
Thrombosis	T. Subbotina, A. Petuhova (2012) [23]	
Brain neoplasms	E. Stolbova, B. Bane (2009) [49]	
Gingivitis	H. Mortazavi, G. Lotfi (2015) [50]	
Periodontal disease	B. Ramamoorthy, S.S. Varghese (2015) [51]	
Minimal risk of development of gestosis Poly-	F. Gilmiyarova, V. Radomskaya et al. (2007) [12, 45]	
ploidy Low-birth-weight fetus		

Link between blood groups B (III) and diseases

by volume Me 12,70%; high saturation of cells with hemoglobin (Me 29,80 pg) is also very common. It should be noted that for patients with AB (IV) blood group the highest concentration of iron in serum – Me 18,8 µmol/l was revealed, which is a prerequisite to supply these micronutrients systems heme synthesis, iron-containing non-heme proteins. The erythrocyte sedimentation rate in females was the lowest (Me 3 mm/h), which indirectly shows the optimal ratio of the electrophysiological parameters of the outer topography of erythrocytes, proteins and other components of blood plasma; characterizes the health of the examined women. The number of cells corresponds to the data in the general population, and the relative content of neutrophils is lower than in individuals with (I) B (II), (III) blood group -Me 51.25%. The absolute content of neutrophils was the lowest Me $3.35 \cdot 10^3$ /ml. We can notice the lowest level of segmented neutrophils (Me 47%), which characterizes the slow maturation of neutrophils

In addition, it was noticed the highest absolute (Me 2,30·10³/ml) and relative content of lymphocytes (Me 38%), representing the basis of any of the immunological phenomena of cellular and humoral performing constant immunological control the antigenic composition of cells, macromolecules, and receipts of foreign material from outside. In those with AB (IV) blood group, the content of IgA (Me 3,64 g/l), M (Me of 1,16 g/l) than in those with other blood groups. Therefore, a low content of C-reactive protein is an indicator of the absence of factors inducing the production of acute-phase response. Along with this tendency to lymphocytosis, a higher level of the entire studied range of immunoglobulins is used as an indication of tension specific resistance and a sufficient compensatory reserve in those with AB (IV) blood group is the result qualified them as healthy individuals.

However, women with AB (IV) blood group had the highest relative content of monocytes (Me 9%), which indicates the presence of stimuli that provoke their increased education for the phagocytosis of pathogens in tissues and integration of the production of cytokines, interleukins, interferons, and components of the complement of a complex mechanism of the immune response. Women with AB (IV) blood platelet count (Me 245.109/l) is lower than in the General population (Me $254 \cdot 10^{9}/l$) and patients with 0 (I) and a (II) blood group – Me of $268,5\cdot109/l$ and $254\cdot10^{9}/l$, respectively, and platelets are the most heterogeneous in size, as evidenced by the width of the distribution of platelets according to this indicator (Me 13,85%). Men with this blood group had the smallest number of leukocytes (Me of $5,75\cdot10^{9}/l$) due to the decrease in the absolute content of neutrophils (Me of 2,80.103/ml) lymphocytes (Me of $1,80 \cdot 10^3$ /ml). For platelets it was typical to had the smallest average volume (Me 10,0 fl) and the large number of them in the blood (Me 262.10%). Significantly reduced the average concentration of hemoglobin

Table 3

The specificity of the owners of AB(IV) blood group is the minimum number of diseases. It is known the predisposition of carriers of AB(IV) to have acute respiratory viral infections, sore throat, chronic tonsillitis, sinusitis (Table 4). Apparently, such parameters of metabolism and cellular composition, described earlier, provide a sufficiently high level of health.

The presented results show that there are group-specific peculiarities of metabolism, the knowledge of which is not only informative in theoretical way, but also applied on the basis of which we have composed the metabolic profile of individuals with 0(I) – AB (IV) blood groups [53]. Summarizing the obtained data, it can be argued that a certain group of genetically determined specificity of the associated molecular processes [54, 55], which, in turn, are obviously a prerequisite for the formation of different health quality (Table 5).

Conclusions

The obtained data are the actual material, revealing individual characteristics of the features of many molecular processes in the personalized indicator - AB0 blood group system. Biological variability of cellular composition of blood and metabolism in various blood groups, in our view, are a prerequisite for the formation of various quality health; serve as the basis for creating an individual health passport, providing increase of accuracy and expansion of the prospects for personalized and predictive medicine as markers of preclinical diagnostics of diseases and monitoring the effectiveness of treatment.

Link between blood groups AB(IV) and diseases				
Sore throat Chronic tonsillitis Sinusitis	S. Garmonov et al. (2004) [17]			
Nasopharynx cancer	Sheng Liming (2013) [6]			

			Table 5
O (I)	A (II)	B (III)	AB (IV)
 High level of α1, α2, β-globulin, urea, CRP; The lowest level of the uric acid, glucose, HDL, LDL; The lowest level activity of AST; Low number of red blood cells; Low level of hemoglobin in the blood 	 Reduced level of albumin, γ-globulin, IgA; Increased level Ig M, Ig G; Low cholesterol, HDL; The lowest value of hematocrit, average content of hemoglobin in one erythrocyte, the average volume of platelets; The maximum number of leukocytes, neutrophils, lymphocytes 	The highest rates of albumin and albumin fractions, glucose, cho- lesterol; The highest level of activity of AST, LDH; The minimum value of SRB, Ig A, Ig M, Ig G; The minimum value of LDL cholesterol, triglyc- erides; – The largest volume of platelets, the aver- age concentration of hemoglobin in one red blood cell	The highest protein content, uric acid; – The lowest value of urea, direct bilirubin, triglycerides; – The highest absolute and relative content of lymphocytes
\downarrow	\downarrow	\downarrow	\downarrow
propensity for somatic diseases	propensity for infectious diseases	high health level	high health level

Table 4

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

References

1. Drannik G.N., Disik G.M. Genetic system of human blood and disease. - K.: Health, 1990. - 196 p.

2. Ivashkiv E.A. Blood Group and urogenital chlamydiosis // Genodiagnostic: Sat. scientific articles. – M., 2002. – P. 31–34.

3. Gerasimova N.D. Distribution of erythrocyte antigens and antibodies in cancer patients: abstract. Diss. Cand. med. Sciences. - M., 2003. - 16 p.

4. Dashkova N.G, Rasnitsyn S.P., Ragimov A.A. Blood Groups and markers of hemotransmissive infections in donors of blood // Bulletin of the Russian blood service. $-2005. - N_{\odot} 3. - P. 21-24.$

5. Shevchenko E.A., Artifeksova A.A., Artifeksov S.B. Clinical, epidemiological and etiopathogenic relationship of the various states of the reproductive system infectious and noninfectious nature with blood groups // Medical almanac. $-2010. - N \ge 2$ (11). -P. 156-158.

6. Sheng L., Sun X., Zhang L. AB0 blood group and nasopharyngeal carcinoma risk in a population of southeast china. – 2013. – № 4. – P. 893–897.

7. Donskov S.I. Antigens of erythrocytes: a handbook on blood transfusion and blood products. – M.: Medicine, 1982. - 94 p.

8. Donskov S.I. blood Groups in human biology – facts and assumptions // The hematology and transfusiology. – 2001. – T. 46. – N_{2} 5. – P. 32–33.

9. Gusyakova O.A. Characterization of the molecular characteristics associated with group affiliation of the blood in the metabolism and cellular composition of blood in norm and pathology: abstract.PhD dissertation. -M., 2009.

10. Nuretdinova (Denisova) S.R. Metabolic characteristics of biological fluids in connection with different group affiliation blood: abstract. PhD dissertation. – Saratov, 2007.

11. Zubov (Selezneva) I.A. Metabolic and structural and functional features of blood at various group affiliation: abstract. PhD dissertation. – Ufa, 2007.

12. Gilmiyarova F.N. Blood group: biological variability of cell composition and metabolism in health and disease / F.N. Gilmiyarova, V.M. Radomskaya, N. And. Gergel and others. – M.: Izvestiya, 2007. – 490 p.

13. Gilmiyarova F.N., Gergel N.And. Kosyakova Yu. AB0group-specific characteristics of red blood cells in normal and in hemophilia // Hematology and Transfusiology. – 2012. – Vol. 57. № 3. – P. 102.

14. Kosyakova Yu.A., Davydkin I.L., Gilmiyarova F.N. Group-specific features of the hematopoietic potential in norm and in patients with hemophilia // Hematology and Transfusiology. -2015. -N 1. -P. 18–21.

15. Altukhov Yu. Genetic processes in populations: proc. allowance. – 3rd ed. – M.: Nauka, 1983. – 279 p.

16. Tamazian G.S., Tananyan A.O.H., Pukulan L.I. Features of clinical manifestations of peptic ulcer disease duodenal ulcer in young patients // Medical science of Armenia. $-2001. - N_{\odot} 41 (3). - P. 89-94.$

17. Garmonov S.Yu., Evgenev, M.I., Zykova I.E. Analytical methods for study of genetic polymorphism of the human body // Questions of biological, medical and pharmaceutical chemistry. $-2004. - N_{\rm D} 1 - P. 3$.

18. Bogdanov N.N. Studies of physiotherapy and balneology (the methodological bases and theoretical prerequisites) parts 9 and 10 academic ed. Centre of KSMU. -2012. -115 p.

19. Björkholm B., Lundin A., Sillen A. Comparison of genetic divergence and fitness between two subclones of helicobacter pylori infect // Infection and immunity. – 2001. - Vol. 69.

20. Aspholm-hurtig M., Dailide G, Lahmann M. Functional adaptation of BabA, the H. Pylori AB0 blood group antigen binding adhesin. Advances in nutrition research 3: 1–22. 21. Taboridze I.I., Aladashvili T.L., Lordkipanidz, E.F. Association of blood groups system AB0 with hip dysplasia // Orthopedics, traumatology and prosthetics. – 1991. – N $_{\rm N}$ 8. – P. 23–26.

22. Hecht B.M., Agafonov B.V., Tsuman V.G. Analysis of the Association of AB0 blood groups and rhesus factor with myasthenia gravis // Herald of the Russian Academy of medical Sciences. – 1995. – \mathbb{N} 6. – P. 16–19.

23. Subbotina T.N., Petukhov A.V., Kovalev A.V. Genetic polymorphisms in predisposition to thrombophilia in people with different blood groups AB0 // Hematology and Transfusiology. -2012. – Vol. 57, Nº 3. – P. 138–139.

24. Arkhipova L.T. Phenotype of blood group system ABO in sympathetic ophthalmia // Russian ophthalmological journal. - 2012. - Vol. 5, № 1. - P. 15-17.

25. Shatokhin M.N., Hemp A.I., Dolgareva S.A. Genetic markers, structural and functional properties of erythrocytes in benign prostatic hyperplasia and chronic prostatitis // Fundamental research. $-2011. - N \ge 11. - P. 391-394.$

26. Miskov I. Group membership as possible determinants of bladder cancer among patients with urological hospital // Bulletin of medical Internet conferences. -2013. - Vol. 3, No 3. - P. 783.

27. Hergetova E.E. Genetic polymorphism of GpIIIa (Leu33-Pro), GpIa (C807-T) and of platelet function in individuals with different blood groups AB0 in normal and influenza A(H1N1)2009: abstract.PhD dissertation. – Chita, 2011. - 24 p.

28. Biswas S., Ghoshal P.K., Halder B. Distribution of ABO blood group and major cardiovascular risk factors with coronary heart disease // Biomed research international. – 2013. Art. № 782941.

29. Chubar S.V. AB0-blood groups, Rh-membership, and blood coagulation in patients with obliterating atherosclerosis]. Business. -1980. - N = 9. - P. 83-86.

30. Meshalkin E.N., Okunev Yu. Blood Group and Rh AB0 in patients with cardiovascular disease // Cardiology. – 1981. – N_{2} 4. – P. 46–50.

31. Freidin M.B. Genomic bases of susceptibility to infectious diseases // Molecular medicine. – 2006. – № 3. – P. 39.

32. Suslova E.Yu., Vasileva L.V. New approach to the diagnosis, the prevention of atherosclerosis and its complications // Bulletin of new medical technologies. – 2012. – Vol XIX, $N_{\rm e}$ 3 – P. 269–271.

33. Rafalovich M.V., Bessonov A., Silbert N. And. The distribution of blood groups AB0 among the population of Karachay-Cherkess Republic and their correlation with the frequency of coronary heart disease // Problems of Hematology and blood transfusion. -1982. -T. 27, $N_{2} 2. -P. 21$.

34. Zinchenko E.I., Koshelev Yu.N. The frequency of cholecystitis in individuals with different blood groups and RH-factor // Clinical medicine. -1975. $-N_{\odot}$ 11. -P. 73–75.

35. Disik G.M. Frequencies of antigens AB0 patients with arthritis and osteoarthritis // Hematology. $-1982. - N \ge 17. - P. 61-62.$

36. Rudometov Yu.P., Umansky K.G., ashmarina E.E. ABO blood groups system and patients with neuroinfections // Journal of neuropathology and psychiatry. S.S. Korsakov. – 1981. – Vol 81, issue. 2. – P. 18–21.

37. Danilov I.P. Significance of blood types in the pathogenesis of thrombophilia // Health: scientific-practical monthly magazine. $-2010. - N \ge 1. - P. 46-47.$

38. Witkowski J.A., Hergetova E.E., Stambovsky N.N. Platelet function and genetic polymorphism of GpIa (C807-T) And GpIIIa (Leu33Pro) in healthy individuals-holders of different blood groups AB0 // Zabaykalsky medical Herald. -2011. $- N_{\odot} 1$. - P. 33–37.

39. Yanchenko, M. V. Blood Group as a factor of prognosis in breast cancer // Siberian oncologic journal: scientific and practical edition. $-2011. - ADJ. \ge 1. - 132 p$

Medical sciences

40. Bektasova M.V., Kaptsov V.A., Shaparev A.A. Tuberculosis as an occupational disease in medical personnel. Evaluation methods of blood group and Rh factor in occupational tuberculosis on the example of Primorsky Krai // Thewayofscience. -2014. $-N_{2}$ 2 (2). -P. 97–99.

41. Gavrilyuk V.P. Relationship of clinical and immunological effectiveness of the treatment of appendicular peritonitis in children with structural-functional properties and the genetic determinism of erythrocytes AB0 and Rh // Fundamental research. $-2011. - N_{2} 11. - P. 277-280.$

42. Doyle B., Quigley J., lambert M. A correlation between severe haemolytic disease of the fetus and newborn and maternal abo blood group // Transfusion medicine. $-2014. - N \ge 24$ (4). -P, 239–243.

43. Rizzato C, Campa d, Pezzilli R. AB0 blood groups and pancreatic cancer risk and survival: results from the pancreatic disease research (pandora) consortium // Oncology reports. – $2013. - N_{2} 29$ (4). – P. 1637–1644.

44. Sadreddini, M., Rasmi Y., Maleki T. Frequency of ABO and Rh blood groups in gastro esophageal reflux disease // Journal of babol university of medical sciences. – 2011. – P. 13–14.

45. Spiridonova N.V. Integrative approaches to the study of toxemia of pregnancy: pathogenetic substantiation of treatment and prevention: abstract. PhD dissertation – M., 2006.

46. Averbakh M.M. Immunogenetics of infectious diseases / M.M. Averbakh, A.M. Moroz, A.S. Apt, etc. – M.: Medicine, 1985. – 253 p.

47. Yamamura K., Ihara K., Ikeda K. Histo-blood group gene polymorphisms as potential genetic modifiers of the development of coronary artery lesions in patients with Kawasaki disease // Int. J. Immunogenet. -2012. - Vol. 39, N 2. - P. 119–125.

48. Suslova E.Yu., Vasil'eva L.V., Valuev V.A. Genetic characterization of an increased risk of developing chronic obstructive bronchitis in patients with ischemic heart disease // Bulletin of new medical technologies. – 2013. – Vol XX, No 2. – P. 162–164.

49. Stolbova E.A., Bein B.N., Tatarenko S.A. Distribution of blood groups system AB0 patients with tumors of the brain // Vyatka medical Bulletin. -2009. - N = 2-4. - P. 39-45.

50. Mortazavi H., Lotfi, G., Fadavi, E., Is ABO blood group a possible risk factor for periodontal disease? // Dental hypotheses. -2015. $-N_{2}$ 6 (1). -P. 14–18.

51. Ramamoorthy B., Varghese S.S., Ramesh A. Relationship between periodontal disease and abo blood group phenotypes-a cross sectional retrospective study // International journal of pharmacy and pharmaceutical sciences. $-2015. - N \ge 7$ (11). -P.386-388.

52. Grebenshchikov L.V. Importance of the blood group in diagnosing the common ENT diseases: abstract.PhD dissertation. - SPb., 2001. - 23 p.

53. Gilmiyarova F.N., Radomskaya V.M., Gusyakova O.A. Biological variability of metabolism associated with AB0 the origin of the blood // Clinical laboratory diagnostics. $-2009. - N_{\rm P} 11. - P. 28-32.$

54. Gilmiyarova F.N., Radomskaya V.M., Shakhnovich E.A. Metabolic profile 0(I)-AB(IV) blood groups // Medical almanac. - 2012. - N_{\odot} 1. - P. 174-178.

55. Gilmiyarova F.N., Kolotova N.A. Gusyakova O.A. Key indicators of carbohydrate metabolism in healthy subjects with different group affiliation the blood system // Kazan medical journal. -2013. - Vol. 94, No 5. - P. 672–674.

Materials of Conferences

ANALYSIS OF SURVIVALS OF PATIENTS WITH NEWGROWTHS WITHOUT PRIMARY-DIAGNOSED FOCUS

Beisenayeva A.R., Sirota V.B. Karaganda State Medical University, Karaganda, e-mail: anel20@inbox.ru

Prognosis and survival of cancer patients mostly depend on the stage of sickness that defines on the base of introoperational findings, histological structure of newgrowth and the level of its differentiation. The patients with newgrowths without primary-diagnosed focus are often admitted to in-patient department with 3-4th stage of newgrowth process that affects the prognosis of sickness.

Aim of the research: to study survivals of the patients with newgrowths without primary – diagnosed focus.

Materials and methods of research. 204 patients with newgrowths without primary-diagnosed focus, treated in PSE "Regional oncological health center" in Karaganda city during 2006-2014 and department of palliative aid of clinic hospital in Lodz city (Poland) were exposed to analysis. Depending on pathogenic diagnosis we defined 9 groups of patients with newgrowths without primary-diagnosed focus: 1 – lymphoproliterative sicknesses, 2 – carcinoma (low-differentiated, serosal, adenocarcinoma, ovarian cancer, metastases), 3 - sarcomata (chondro-low differentiated, pseudo-spindle-cell, osteo-, mielo, small-cell, fibro-, lipo-, giant-cell), 4 - nerve roots newgrowths (neuroblastoma, neuroschwannoma), 5 – newgrowths of blood vessels (perithelial endothelioma, histiocytoma), 6 - melanoma, 7 dermoid cancer, 8 - other newgrowths, 9 - innocent developments. The analysis of survival of patients with newgrowths without primary-diagnosed focus was conducted within gapless method according to Kaplan – Meier, where the survival in time gap equal to 1 month within computer program «Statistics 10.0» was defined.

Results of research and their discussion. The common survival of all patients with newgrowths without primary – diagnosed focus during the first year was equal to 72%, during two years – 62%, three years – 58%, four years – 50% and five years – 41%.

Furthermore, the survival of patients was calculated according to pathogenic diagnosis. Oneyear survival of patients with lymphoproliterative sicknesses (group 1) according to Kaplan – Meier composed 70%, then during two-five years – 63%.

Survival of patients with carcinoma (group 2) composed: during the first year -71%, during two years -62%, three, four and five years -50%.

One-year survival of patients with sarcomata (group 3) comprised 52%, two- and three-year -48%, four-year -3%, five-year -0%.

Common survival of the patients with newgrowths of nerve roots (group 4) composed: during the first year -82%, during two years -70%, three and four years -62%, five years -20%.

One-year survival of patients with newgrowths of blood vessels (group 5) according to Kaplan – Meier composed 70%, two-year – 60%, three- and four-year – 40%, five-year – 0%.

Survival of patients with melanoma (group 6) composed: during the first and second year -62%, three years -48%, four years -0% and five years -0%.

One-year survival of the patients with dermoid cancer (group 7) comprised 90%, two and three-year -39%, four-year -19%, five-year -0%.

Survival of patients with other newgrowths (group 8) comprised: during the first year -80%, the second year -60%, the third and fourth -40%, the fifth -0%.

Conclusion. Almost all patients with newgrowths without primary – diagnosed focus were admitted to in-patient department with the 4^{th} stage of newgrowth process, but the survival in detached different groups of the patients is different. Patients with lymphoproliterative sicknesses have the highest level of survival – one, three and five-year survival is equal to 70% and for 63% as relevant.

The work is submitted to the International Scientific Conference «Practitioner», Italy (Rome-Florence), September, 10–17, 2016, came to the editorial office on 19.08.2016.

THE ROLE OF ULTRASONOGRAPHY IN DIAGNOSTICS PANCREATIC DISEASES IN CHILDREN

¹Ulyanovskaya S.A., ²Bazhenov D.V., ¹Malyavskaya S.I., ¹Fokin A.D.

¹Northern State Medical University, Arkhangelsk, e-mail: usarambler78@rambler.ru; ²Tver State Medical University, Tver, e-mail: bajenovd@mail.ru

Purpose – to study the data of ultrasound examination of the children's pancreas. Materials and methods. The analysis of the 480 stories of infant's city Hospital Novodvinsk Arkhangelsk region (2007–2012). 11720 results and ultrasound of the pancreas on materials Regional Children's Clinical Hospital (2011–2014). The data are statistically processed by methods of nonparametric statistics.

Medical sciences

Results of research and their discussion

1. It has been found that the pancreas had normal dimensions, sharp contours, pancreatic duct is not expanded parapancreatic fiber is not changed, the bulk formation have been identified. The values of thickness in the area of the head, body, tail were within the age and species norm: head $8,6 \pm 1,01$; body $5,3 \pm 0,86$; cauda $7,0 \pm 1,04$ mm [1, 2, 4].

2. The thickness of the pancreas was significantly different for children of different groups of health. With increasing health groups a decrease in breast thickness in all parts of [3, 4, 5].

3. Changes at ultrasonic research of the pancreas are observed at presence of cysts and cystic fibrosis. These diseases are often are identified in children after 12 years, in boys and girls with equal frequency. So ultrasonic research of children's of the pancreas has an important diagnostic significance, especially if there is a serious disease.

References

1. Dvoryakovsky I.V. Ultrasound in neonatology and pediatrics. Differential-diagnostic criteria. – M.: Air-Art, 2000. - 216 p.

2. Kovrov K.N. Ecological morphology of prenatal stress in humans in the European North. The thesis for scientific degree of candidate of Medical Sciences / NSMU. – Arkhangelsk, 1997.

3. Prenatal risk and morphogenesis of the human / S.G. Sukhanov, K.N. Kovrov, S.A. Dynina, T.N. Lukyanova // Ecology of Human. – 2004. – № 3. – P. 24–26.

4. Ultrasound examination of the pancreas in infants / S.A. Ulyanovskaya, T.V. Dzekunova, T.A. Ogorelkova et al. // Russian Journal of Pediatrics. $-2013. - N_{\rm P} 1. - P. 37-39.$

5. Ulyanovskaya S.A. Development of the fetal pancreas and diabetes / S.A. Ulyanovskaya, D.V. Bazhenov // Journal of anatomy and histopathology. – 2015. – T. 4, № 3. – P. 122–123.

The work is submitted to the International Scientific Conference «Fundamental and applied research in medicine», Netherlands (Amsterdam), October 20–26, 2016, came to the editorial office on 04.10.2016.

Short Reports

LIPID METABOLISM IN RESPIRATORY VIRAL INFECTION BURDENING OTOLARYNGOLOGICAL HISTORY

¹Solovieva N.V., ²Kuznetsova N.S., ¹Zenkova T.L. ¹Chita State Medical Academy, Chita; ²Transbaikal State University, Chita, e-mail: kns2702@yandex.ru

The article presents the results of influence of burdened otolaryngological history on data of the system "lipid peroxidation – antioxidants", range of higher fatty acids in children with acute respiratory viral infections. Deep negative changes of these parameters are revealed in patients with chronic upper respiratory tract diseases at the level of bronchopulmonary system and body as a whole.

The impairment of the respiratory system is determined by the independent role of the bronchi in the pathological process and the secondary premorbid background which increases the rate of the disease, weighing outcome and the therapeutic prognosis. The approach to the relationship between acute and chronic non-specific lung diseases, upper respiratory tract (URT) and the interdependence of the components of bronchopulmonary apparatus is one of the main approaches in modern pulmonology. The incidence of acute respiratory viral infection (ARVI) is still high among pediatric patients. That's why there is a need to study the problem including the biochemical level.

The purpose of the research: is to study the influence of chronic recurrent disease of upper respiratory tract on dynamics of lipid homeostasis parameters in acute respiratory viral infection.

Materials and methods of research

The study involved 29 children (3–14 years) with acute respiratory viral infections (mediumsevere form) living in the city of Chita and have been treated in outpatient departments. The patients had a comprehensive X-ray examination and a consultation of otolaryngologist. The control group included 50 healthy children without a history of viral infection in the last six months. During clinical study two subgroups were isolated from the control group: A - without burdened otolaryngological history and B - with a history of upper respiratory tract pathology. The parameters of lipid metabolism in the vapor exhaled air condensate and in the blood serum were studied by the well-known laboratory methods [9-15]. Statistica 6.0 for Windows software package (version 6,0 StatSoftInc) was used in statistical analysis.

Results of research and their discussion

The received findings showed that in acute respiratory viral infections the deficit of antioxidant activity (AOA) was revealed in the surfaceactive lining layers of the lungs in patients subgroup A - 62,5% (p = 0,042). In the same group but without chronic foci of infection this index in expirate was 16,3% (p = 0,038). It is obvious that the penetration of the virus into the body of the child suffering from concomitant otolaryngologycal pathology exacerbates the moderate imbalance of prooxidants neutralization factors due to the development of free radical process. The deficit of antioxidant activity of blood serum did not reflect the significant changes of organism resistance. It proves that the organism has the adequate compensatory possibilities. Besides there was an increase both in the initial and final intermediates of lipid peroxidation in the midst of ARVI in the subgroup B in comparison with A. The development of acylhydroperoxides of lipids (1,56 and 1,76, p = 0,032) was observed in both groups at the level of pulmonary surfactant system, TBA-positive material (142,4%, p = 0,047)and 157.9%, p = 0.021) regarding to the control data. It proves the fact of intensification of free radical processes in the surface layers of the lungs and on the organism level due to chronic recurrent pathology of URT. The correlation analysis of parameters revealed that in patients with ARVI and otolaryngologycal pathology there was a link between the acyl hydroperoxides content and the deficit of antioxidant activity (AOA) in the expirate (r = +0,74; p = 0,001);concentration of TBA-active products and the level of antioxidant activity in the system of pulmonary surfactant (r = +0.83; p = 0.003); between the final and initial products of peroxidation of blood lipids in the surface layers of the lungs (r = +0,88; p = 0,001). The same link was registered between the deficit of antioxidant activity of blood serum and vapor exhaled breath condensate (r = +0,57; p = 0,048). As it's known the level of fatty acids (FA) is a reflection of the structural and functional condition of the alveolar-capillary membrane. The total pool of fatty acids in the condensate of children with ARVI tended to decrease in both groups with more marked changes in the subgroup A: the reduction of the amount of stearate C17:0 and the increase of concentration C20:0. The presence of infection in the URT caused the deviations from the norm due to falling levels of C14:0, C18:0 (p = 0.038). The growth of monoenic FA in the subgroup A is 26,9% (p = 0,035) in the subgroup B is 15,4%

due to palmitoleic acid. The polyunsaturated FA of blood serum led to the development of their relative deficiency in ARVI depending on the presence of chronic infection. Thus for the children of subgroup A without otolaryngologycal pathology in their history the decrease of linoleic acid concentration to 1,2 times (p = 0,028), arachidonic acid to 1,4 (p = 0,031) with the increase of linolenic acid to 1,6 (p = 0,033) were revealed. Chronic illnesses of the URT had practically no effect on the content of linoleate, although similar changes in the subgroup B occurred for linolenoate – the increase to 2,0 times (p = 0,021) and the decrease of arachidonate -1,7 (p = 0,017). The disintegration in polyene FA family confirms the existence of complex metabolic pathways conversion of lung surfactants. Furthermore the uniformity of vibrations both in blood serum and in the surfactant membrane of a number of fatty acids (C20:4, C18:2, C18:3) was revealed.

Conclusion

The interpretation of the received data in the aspect of chronic recidivous URT pathology revealed the highest degree of free radical lipid peroxidation disbalance in this group of children both at the level of the alveolar-capillary membrane and the whole organism. The peculiar mark due to the secondary infection and the indirect influence on the fatty acid composition of lipids in spite of the same type vibrations was revealed in certain specific features.

References

1. Afanasieva O.I. Burdened premorbid background as a risk factor for unfavorable course of influenza in children / O.I. Afanasiev [et al.] // Baby infection. -2011. - T. 10. - N = 4. - P. 25-28.

2. Karpova E.P. Possibilities of treatment and prophylaxis of acute respiratory viral infections in children // Farmateka. – $2015. - N_{2} 1. - P. 49-52.$

3. Khyshiktuyev B.S. Methods for determination of lipid peroxidation products in exhaled breath condensate and their clinical significance / B.S. Khyshiktuyev, N.A. Khyshiktuyeva, V.N. Ivanov // Clinical Laboratory Diagnostics. $-1996. - N \cong 3. - P. -13-15.$

4. Solovieva N.V. The value of some biochemical parameters of blood and exhaled breath condensate in the diagnosis of respiratory diseases in children // Bulletin of the physiology and pathology of respiration. –2004. – Vol. 18. – P. 41–43.

THE FEATURES OF FASHION INDUSTRY IN THE SOVIET UNION

Vinichenko I.V.

Omsk State Technical University, Omsk, e-mail: irvin61@mail.ru

The article contains the review and analysis of problems in Soviet fashion industry. The particular attention is paid to the development in quality system and diversification in light industry achieved as a result of measures taken to improve the Soviet people's well-being. The study was conducted within the framework of social history. In this case, not only the way of thinking of individual persons or groups, patterns of social behavior, but all the changes in the environment, structures and processes which direct the conditions of human activity and define the entire organization of social life were considered.

Keywords: fashion industry, apparel industry, assortment, fashionable clothes, quality assessment system, population needs

Modern Russia is going through a difficult period in its history; it is seeking for a new way of life. It applies to fashion, which takes a special place in the society. At present there is an urgent need for a comprehensive study of the Soviet fashion, as a multi-level system consisting of a specific set of elements which are connected with each other. Fashion industry is one of elements in this system. The problem of studying the process of creation and modernization of the fashion industry in the Soviet Union during the period of the "thaw" to "stagnation" and public policy analysis on the development of light industry and services together with the task of improving the well-being of the Soviet people were not sufficiently studied and developed.

The purpose of research is to reveal the specifics of the fashion industry enterprises in the Soviet Union and the implementing features of fashion designs into production during the period of the "thaw" to "stagnation".

Every epoch creates its own aesthetic ideal of a man, its own standards of beauty, which are expressed through costume design, its proportions, details, materials, color, hairstyles, and make-up. A cultural and aesthetic model, which is then translated into society, appears this way. Large and small events in the world and in the country influence on fashion. We usually understand fashion as a set of dress senses and attitudes prevailing in a particular social environment during certain and usually short period of time. The fashion industry as the term includes the process of designing, production and distribution of fashion products.

Beginning the analysis of the Soviet fashion industry, we assumed that the implementation of long-term strategy, which foundations were laid down by the government after the revolution, turned the USSR into an industrial power, helped it to win World War II and to strengthen its geopolitical position. But all was made by enormous losses. However, the implementation of this strategy led to the formation of economic development priorities and stereotypes of economic thinking, which became to stifle the economic growth of the USSR further. First of all, the lack of resources touched industries that produce consumer goods, including light industry and services. The lag in the development of the consumer sector in the economy from 1950–1960 was of deformation in nature, it slowed down the economic development of the country [1, p. 34–35].

The development of Soviet culture is considered in connection with the politics, economics, and ideology within the social cultural history. The specifics of the Soviet system did this relationship particularly hard. Therefore, the formation of fashion was not determined by creative consciousness of artists (although it should be clear that creativity cannot be canceled while creating any work), but the ideological order. Ideology penetrated the culture, and culture, in its turn, promoted ideology in the society with the help of professional tools. At the same time great importance was given to cultural and educational role of fashion.

Considering the social processes in the Soviet society, one should take into account the implementation of the modernization in the society as the transition from one socioeconomic and political development stage to another. In the period modernization had affected all spheres of social life; its influence was obvious in Soviet everyday life, including costume and fashion.

Getting down to the study of the Soviet fashion industry during the period of the "thaw" to "stagnation" it is necessary to consider the characteristics of clothes production for the population. In the postwar period the fashion industry was just aimed to saturate the market with consumer goods, furthermore the clothes for Soviet citizens should be adapted to the conditions of their lives. A new stage begins after Khrushchev came to power. Improving the welfare of the people was announced as one of the central tasks of the government.

Consumer demand began to focus not on amount only, but on the structure of supply; the requirements of people to the quality and range of products raised. Requirements for products of light industry were also changed. Thus the fashion industry should satisfy the needs of the Soviet people in the consumer goods. More than that, examples of the Soviet fashion had to confirm their advantage over the West ones. The matters of quality and range of products appear in the fashion industry for the first time. At the same time the government tries to include the fashion production into the system of planned economy.

The ways to accomplish the task included the organization of production growth in the sphere of consumer goods and improving their quality, modernization of light industry enterprises. The differentiation of sewing and textile production was made by the country authorities, as well as the methods of work organization and evaluation system of product quality were improved; scientific research and development in the field of modeling and designing clothes was also conducted.

On the one hand, the results of modernization contributed to the development of mass production; on the other hand, the intended goals were not always reached. Fashion did not fit into the system of planned economy. It is not coincidence that economists came into the discussion on fashion and style, that was organized by the magazine "Decorative Arts of the USSR" in 1963–1964; they said: "Fashion is expensive. <...> It brings a lot of trouble in industry". [2, p. 12].

The main problem the economists concerned was material needs. From this point of view, fashion acted as a negative and alien factor of socialist economy that interfered the planned production, distribution and consumption of clothing [2, p. 13]. By measuring the needs of the population, the economists at the State Planning Commission calculated the rate of rational consumption. In compliance with their calculations, all Soviet citizens had to consume the same amount of clothes and shoes to their full wear out, that is, without the influence of fashion.

Fashion designers determined the basic function of fashion as education of dress sense among consumers. However, they believed that sensationalism and extravagance were not character features of the socialist fashion, but it should be convenient, practical, functional, and hygienic.

The function of fashion popularization was put on trade. "It is trade that should be the most aware of the modern fashion nature" [3, p. 53–54]. Sales workers were accounting movement of goods in the shops. But by ordering goods which were of high demand last season, representatives of trade formed a culture of consumption, which contradicted the fashion dynamics.

To avoid failures in the implementation of the plan and to be able to surpass it, textile and clothing makers preferred to stick to well established factory models, selecting a model for mass production.

As a result, at the time when everybody were taken care of the population needs, it was not easy to buy fashionable clothes in the stores: "Outwardly, it seems that there is an abundance in the shops, but in fact, consumers are with needs for many things, including those which have already been produced under the plan, but lie motionless because of their poor quality, oldfashioned and unfashionable shapes and colors" [4, p. 12].

The role of the service sector is increasing with the society development. Many families suffered from the constant need in sewing and repairing of clothes and shoes. Limited range or lack of these goods in the shops forced people to look for ways to realize their needs. In turn, the service sector was not able to satisfy the needs of the population as well. In the 1950s the weak development of the network of state and co-operative dress-making establishments, tailoring shops and repair centers was clearly demonstrated. It was expressed in poor service and excessive prices. The population needs in this kind of service contributed to the expansion of the "private" sector, which carried out orders fast and relatively cheap.

The state encouraged tailoring at home. There was a special regulation related to this self-service. It expressed in active offer of patterns, developed by Soviet designers, in annexes to the women's magazines and textbooks of cut and sew, and active selling of sewing machines. A retrospective study of Light Industry functioning in the USSR shows the negative trends in the industry: the growth of disparities, lack of dynamics in the assortment structure of production and its quality. The existing economic system and measures for the development of industrial manufacture in light industry were extremely inefficient.

At the beginning of the study period the enterprises, producing consumer goods, were aimed to increase production. In the early 1960s, it transformed into the task of satisfying the needs of Soviet citizens in the clothing and footwear that meets the requirements of product quality and compliance with fashion trends. At the same time production of fashion industry enterprises had to meet the requirements of the political and ideological leadership of the country.

Big problems occurred with the implementation of fashion production. The program of reforms aimed at improving the material well-being of Soviet citizens was declared by the Soviet government. Solving the problem of population's unsatisfied demand, the main forces were concentrated on the development of large-scale factory production. Small-scale and pilot production was described as "hopeless". The selection of models for implementation in production was carried by arts councils, which mainly consisted of representatives of manufacturers and managers at various levels.

First of all, enterprises tried to produce the goods, which were beneficial to the plan, and poorly orientated on diverse needs of consumers. Models that were interesting, but difficult in producing, selection of materials, finishes, and accessories were rejected. As a result, the unpopular goods and the products of poor quality were available in the shops abundantly. Although the party and the government was constantly trying to effectively coordinate the activities of various parts of the production and distribution of clothing, the range of goods in the Soviet stores did not meet consumers' demand during the study period.

Low quality of products was due to the general economic-technical condition of the industry. Industrial policy was based on the priorities that have developed under the influence of the Bolshevik doctrine. In the late 1960s and early 1970s it no longer met the needs of economic development of the country, although it was a kind of update. It is reflected in the fact that in the early 1970s the party and the Soviet Union state leadership announced its intention to rapidly develop industrial production of "B" group, including light industry, but indeed, the alternative policy was held. The share of investments directed to the development of consumer goods production, including light industry, diminished even more. The lack of investment had a negative impact on the development of this industry, which needed modernization emergently. The critical state of the industry was delayed because of the re-engineering slow pace. It was not conducted in complex that did not allow effective use of modern equipment [5].

The problems of quality garments were solved due to the development of new standards for assessing the cost of processing, the introduction of new standards and pricelists, the introduction of a new system of assessing the quality of products, production specialization, modernization of the textile industry, the system of staff training and retraining, the introduction of various mechanisms of material and moral incentives. These actions had positive results at the particular period. But, despite the expansion of state control over product quality, enterprises continued to produce the goods which quality did not meet the demands.

Manifestation of the crisis in the light industry became a problem of products marketing. In the first half of the 1970s, based on the priority of policy planning, the party and state leadership of the Soviet Union adopted a number of decisions, directly or indirectly aimed at narrowing the scope of economic reforms, marked the 1965 reform. As a result, the rights the enterprises acquired during the reforms have been limited. Their dependence on the ministries and agencies had increased. It had particularly negative consequences for the light industry. They lost any possibility to reconstruct production in accordance with market conditions of the consumer market. In terms of preservation and development of the consumer market, the attempts of the party and the USSR government to provide light industry enterprises with such opportunities by strengthening the system of state central planning testified about the isolation of the state policy from the real economic situation.

Throughout the study period the total number of service enterprises increased, the volume of household services grew rapidly. But along with the new trends in the development of services enterprises, the changes in their work were slow. The problems of quality and service culture were sharply on Historical sciences

the agenda the entire Soviet period of the industry. Intensive development of enterprises, integration and specialization, modernization of equipment were not able to save the population from the queues in the tailoring establishments. As a result, the growth of welfare, cultural level, and the needs of workers changed the structure of household services. But the number of orders for tailoring increased, that indicated the unsatisfied demand in fashionable clothes.

Thus, the light industry of the period was not able to fully implement its tasks to meet the needs of the population in beautiful and fashionable clothes. Inertia of mass tailoring prevented systematic penetration of fashionable clothes on the shelves of the state stores. Products of clothes factories were marked by conservatism; it ignored the dynamics of fashion. Soviet consumers, who watched the fashion, were forced to sew clothes at home, at individual tailors or in tailoring establishments.

Fashion industry establishments could not provide the Soviet stores with quality products, as the party and government policy had a huge influence on the development of the crisis era of "stagnation", including the light industry. In particular, it expressed in failed attempts to reform the current economic system during the Soviet era. Negative trends in the industry continued to deepen in the 1970s and 1980s, holding back economic growth of some regions and the country as a whole.

References

1. Vinichenko I.V. "Soviet fashion" in the context of social, economic and cultural life of the USSR in the 1950s-1960s // Omsk Scientific Bulletin. – 2008. – № 3 (67). – P. 34–37.

2. Braverman A. Moda glazami ehkonomista [Economists look at fashion] // Fashion Decorative art of the USSR. -1963. $- N \ge 10. - P. 12-13$.

3. Savelyeva N.T. Moda i massovyj vkus [Fashion and mass taste]. – M.: Light industry, 1966. – 59 p.

4. Bitekhtin B. Assortiment ili sluchajnoe skoplenie tovarov? [The range of goods or occasional congestion?] // Fashion Decorative art of the USSR. – 1964. – № 8. – Р. 12–13.

5. Vinichenko I.V. Soviet fashion industry from the Khruschev thaw to the era of stagnation: problems and solutions / I.V. Vinichenko, N.A. Goncharova, N.V. Okishev, M.A. Vinichenko // In the world of discoveries. $-2011. - N \ge 11.3. - P. 913-932.$

INTENSIFICATION OF TEACHING PROCESS OF RUSSIAN IN THE SYSTEM OF FOREIGN STUDENTS VOCATIONAL TRAINING IN MEDICAL UNIVERSITY

Dmitrieva D.D.

Kursk State Medical University, Kursk, e-mail: darja.dmitrieva2011@yandex.ru

The article is devoted to the problem of intensification of Russian language teaching process in the system of vocational training of foreign students in medical university. The author considers an importance of Russian as foreign for social and professional communication of medical students and for their vocational training. In the article the pedagogical model of effective teaching of Russian as foreign is represented, its structural and profound characteristics are revealed. The main principles of this pedagogical model are described in details. The author draws a conclusion that a combination of methods, means, and pedagogical conditions from the developed model allows to increase an efficiency of teaching of Russian as foreign in the system of professional training of students in medical university.

Keywords: Russian as foreign, the pedagogical model, an intensification of teaching, a vocational training

An important task of a modern teaching methodology of Russian as foreign is an increase of efficiency and quality of education. This task can be solved with the help of the optimization of educational process and all factors determining result of teaching.

The language is an important component of life. It is of great importance not only for daily terrestrial human communication, but also plays a significant role in the professional sphere.

The professional sphere is fundamental in the human activity. It is known that guarantee of successful professional activity of the medical specialist consists not only available necessary knowledge, but also abilities of the professional communication directed to the communication with the patient during rendering professional medical care.

Thus, professional communication of the doctor is an actual problem of modern medicine.

Research objective – to study ways of increase of efficiency and quality of teaching of Russian as foreign in the system of medical students' vocational training.

Now in Russian medical universities there is a large number of foreign students for whom studying of Russian is a necessary condition for social and professional communication, and also for receiving specialty.

We consider an importance of Russian as foreign in medical students' vocational training.

Foreign students of Russian medical universities do practical training in Russian hospitals and policlinics. So they must communicate with Russian patients. Thus, it is very important that by this time foreign students have necessary knowledge and skills.

During the question of the patient it is necessary to find out correctly personal data (full name, age, address, a profession, marital status, etc.) and complaints of the patient. Then it is necessary to collect the anamnesis of disease and the patient's life. It is very important to do correctly subjective and objective examinations.

Thus, Russian is necessary for foreign students of medical university for adequate communication with patients and acquisition of the experience important in future profession.

So it is necessary to work out a special model for intensification of teaching of Russian in the system of foreign students' professional training in medical university. This model must correspond to the professional tasks specific to the doctor. Creation of such model will allow making teaching process of Russian as foreign in the system of future specialists' professional training more purposeful, managed and effective.

We represent a pedagogical model of intensification of teaching process of Russian as foreign in medical university (Figure).

The pedagogical model of effective teaching of Russian as foreign in the system of medical students' professional training consists of four components: objective component (the objective), theoretical component (approaches, principles), technological component (methods, tutorials, pedagogical conditions), component of results' estimation (criterions and indicators, result).

Teaching of Russian in the system of foreign medical students' vocational training will be successful in case of using main methodical principles constituting a basis of professional communication.

Principles of individualization, a professional orientation, variability, integration, a principle based on the solution of problem situations, functionality, a principle of training in communication on the basis of situations, a principle of study a foreign language through communication are interconnected.

We describe in detail these principles.

1. The principle of individualization is fundamental during teaching of Russian as foreign and one of the main tools for motivation and activity of students. We will examine in details the meaning of the concept "individualization". Generally the individualization is an adaptation of educational process to opportunities of students; the choice by each of students of own technology of Russian acquisition [2].

The speech of any person is individual at least in three parameters: according to mechanism of motivation of the speech, to contents of the speech statement, to a way of a formulation of thought. The process of study Russian as foreign is also individual [3].

During teaching of foreign language it is necessary to give each student a speech task according his requirements and personal interests. Only in this case individual reaction is possible. So if we want to cause proper response, it is necessary to consider individual and especially personal qualities of foreign students: their life experience, an activities context, an area of interest, tendencies of the emotional sphere, outlook, the status of this personality in collective, and also distinction of cultures, traditions, customs, religious and political convictions [5].

2. According to a principle of professional orientation, an educational activity of medical students in the teaching process corresponds to their future professional activity. The contents of the program for Russian as foreign for medical students have to include the material which is of professional interest to them. Tasks have to stimulate process of transformation of theoretical representations of future profession into practical skills.

Realization of this principle helps medical students to understand better an essence of their future profession in various sociocultural situations of communication. It develops interest and forms dominating motives, so creates a professional orientation of education. The principle of a professional orientation promotes a realization in practice of professional culture's transfer according the principle "to know – to can – to create – to want" and a formation of professional readiness for future professional activity [4].

3. The principle of variability provides the variety and the choice of methods, forms and types of works not only for the teacher, but also for the student. So this principle increases student's cognitive activity. The student can choose himself a task and a way of his performance.

4. Principle of integration. A teaching process of Russian as foreign in the system of medical students' professional training will be more effective on condition of integration of discipline "Russian as foreign" with special medical disciplines ("Surgical diseases", "Internal diseases", "Obstetrics and gynecology", "A public health and health care", etc.). Integration of disciplines of general cultural and special cycles helps foreign medical students see possible conditions of sociocultural communication in various professional contexts [1].

Thus, integrative connections promote formation of motivation, development of analytical way of thinking, expansion of a sociocultural and professional outlook and formation of professional and communicative skills and abilities.

Integrative knowledge allows the medical student to have a complete impression about that world in which he lives, about his sociocultural features and regularities.

5. Principle based on the solution of problem situations. According to this principle, students must solve some problem which can arise in their future practical activity. At first a teacher plans ways of a solution of the problem then students try to solve similar problem situations independently.

6. Principle of functionality. According to this principle students study functions of different types of speech activity as means of communication. Grammatical and lexical units not only have the form, but also carry out the function. At the same time forms of lexical units or grammatical structures are associative-ly connected with the functions.

Thus, it is necessary first of all to draw the student's attention to function of speech unit, and then – to the form. Functionality means a learning of words and grammatical forms directly in activity.

7. Principle of communication training on the basis of situations. According to this principle students study Russian as foreign with the help of speech situations. The situation is an integrative dynamic system of different relationships between subjects of communication. The situation is a universal form of functioning of teaching process. It is the main condition of formation of skills and development of speech abilities. Thanks to the situation we can develop communicative competence of foreign students. 8. Principle of study Russian as foreign through communication. Communication is a human activity. A main objective of teaching is a learning of foreign culture as means of formation of the student's personality. Thus, communication can be used for education, knowledge and development. Communication is a necessary condition of the correct education. So, communication is one of the main kinds of human activity and realizes functions of education, training, knowledge and development in communicative teaching of foreign culture.



EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

Pedagogical sciences

Teaching process of foreign communication represents a model of real communication process in such parameters as: intention, motivation, novelty, informational content of process of communication, functionality, a dependence of situation, nature of interaction of students and system of speech means using by students. Therefore, it is possible to create teaching conditions which are adequate to real. It helps students to develop necessary abilities which they can use in the conditions of real communication [3].

It is important to note that all these principles are interdependent, interconnected and represent a united system. It determines a strategy of effective teaching of Russian as foreign in the system of professional training of medical students.

Therefore it is necessary to observe all these principles for the best result. It allows to train real specialists which can use Russian as foreign in their profession.

It is possible to optimize educational process by identification and use of reserve opportunities. The content, methods, means and conditions of teaching of Russian as foreign must be adequate to objectives. During teaching Russian to foreign students it is necessary to choose methods and tutorials according to their psychophysical structure, national and personal peculiarities. It is important to intensify teaching process of foreign students, trying to obtain at the same time not only achievements of effective objectives in shorter time, but also the best results.

The equipment of educational process by adequate audio, audiovisual and visual tutori-

als, textbooks is necessary for effective study of Russian by foreign students.

The intensification of teaching is connected also with searches of new, optimum methods of work. One of the important reserves is the teaching according to psychophysical structure of students, to their national and personal peculiarities, it means training individualization.

So, the correct organization of a teaching material, use of a complex of audio, audiovisual, visual electronic tutorials and textbooks and also oriented and individualized training are those means which allow to increase efficiency and to improve quality of teaching of Russian as foreign.

As a result of this research, it is possible to draw a conclusion that a combination of methods, means, and pedagogical conditions from the model developed by us allows to increase an efficiency of teaching of Russian as foreign in the system of students professional training in medical university.

References

1. Dmitrieva D.D. Individualization of vocational training of medical students on the basis of integrative and modular approach to studying of Russian as foreign: Abstract of the thesis of the candidate of pedagogical sciences. – Kursk, 2012. – 28 p.

2. Kostomarov V.G., Mitrofanova O.D. Technique of teaching Russian as foreign. – M.: Russian, 1990. – 268 p.

3. Kuzovlev V.P. Methodical characteristic of a class as means of individualization of foreign communication teaching process // Foreign languages in school. – 1986. – N 1. – P. 31–38.

4. Lerner I.Ya. Interconnection of teaching and education in united teaching and educational process. - M.: Pedagogics, 1986. - 189 p.

5. Passov E.I. Communicative teaching method of foreign speech. – M.: Education, 1991. – 223 p.

INSTITUTIONAL ASPECTS OF HIGHER SCHOOL MODERNIZATION IN CONDITIONS OF EDUCATION GLOBALIZATION

Pak Yu.N., Koshebayeva G.K., Pak D.Yu.

Karaganda State Technical University, Karaganda, e-mail: Pak gos@mail.ru, Pak kargtu@mail.ru

There are considered the main directions of higher education modernization. It is noted that the processes of globalization represent the most difficult transformation of the world system in which there are risks of selecting the unified and simplified integration models. In the conditions of globalization and an expanded massification of higher education there emerge institutional contradictions caused by insufficient budget financing, changing educational priorities, insufficient competence of the managerial personnel, the low performance of monitoring studies, the noncompetitive pay level of the teachers' work. The need of implementing the competence-based approach requiring scientifically based methodology of transforming the graduate's qualification characteristic and professional competences into the content of the educational program is staticized. There are given recommendations for developing the social partnership between a higher education institution and an employer and to strengthening the role of independent accreditation as the major mechanism for managing the education quality.

Keywords: education globalization, Bologna Process, quality assurance, accreditation, competence-based approach

In the conditions of globalization the importance of the country is determined not so much by mineral raw material resources but by the competitiveness of economy which level depends on the development of the knowledge-intensive and high-tech production and rates of its innovation. The decisive factor in providing all this is the expanded reproduction of knowledge, inconceivable without higher education. Budget costs for education are not a burden of the state but investments into a person that are the most profitable to the society in the long-term prospect.

In the current trends there is reflected the increased value of higher education and recognition of a high role of universities in the forward development of economy. Today the world is at the stage of transition to the sixth technological way. In the number of leaders there will be countries that timely reached this stage. The state program of industrial and innovative development (GPIID-2) assumes a high-tech post-industrial society with the developed intellectual potential. In the present day world there is firmly affirmed the thesis: education is the first link in the chain leading to the development of high technologies.

Innovative education is, first of all, the advancing education. Without denying the need of implementing the tasks of today, present day requests of the society including the labor market, it is necessary to be guided by the predicted future requests. It is useful to remember the achievements of the Soviet education which can find a second wind today as retro-innovations.

The competitive strategy of Kazakhstan in the context of Strategy-2050 shall be based on the development of scientific and educational potential of the country. Unfortunately, this potential does not fully conform to the requirements of the knowledgeintensive economy. The competitive line items of Kazakhstan in the world economy are still rather low. There is no due demand for intelligence. The products are not quite competitive, they are not very science intensive and technologically efficient.

The process of globalization, despite its objectivity, represents the most complicated transformation of the world system in which there is a danger of selecting the unified and simplifying integration models. The Bologna Process which Kazakhstan joined in 2010 is an example of an integration vector of globalization. This required considerable changes in the educational policy. In particular, in 2012 they refused the state educational standards in specialties of higher and postgraduate education. The SCES of higher and postgraduate education approved by the Order of the RK Government in 2012, and then in 2016 have a framework character, they do not consider specifics of this or that specialty. The qualification characteristic of the graduate with the description of labor functions of professional activity, the requirements to professional competences is not considered in them and there is no concentrated statement of educational programs for cycles of disciplines.

In SCES-2012 it is noted that the core component (CC) acts as a fundamental kernel of the educational program and specialty in general which provides an integrated educational space in the country [1]. This formulation is in principle impracticable because the CC of the cycle of majors (M) constitutes, according to the requirements of the SCES, only 5 credits (15,6%), and the elective component 27 credits (84,4%). Is it possible to provide with the module of 5 credits a fundamental kernel of vocational training? What an integrated educational space can there be spoken of?

In the conditions of massification of higher education oriented mainly to the solvent demand of the population, there is a conflict of entrepreneurial interests of higher education institutions and requirements for ensuring the needed quality of training specialists. Unfortunately, in this conflict more often there win financial interests of higher education institutions. As a result the market is replenished with unclaimed young specialists. The reason is that massification performed a more socialization function but not the youth professionalizing.

Today in the assessment of the quality of education it is necessary to draw a distinction between the process directed to achieving the planned results and concrete results of the educational activity. The prevailing role is played not by the volume of the acquired knowledge but professional competences and ability of a creative approach to solving various situational tasks of professional activity.

In Kazakhstan there has been formed the National system of the education quality evaluation [2] including various control procedures and estimates: licensing, certification, accreditation, licensed control, external assessment of educational achievements, single national testing (complex testing of entrants), ratings, final state assessment of students (Figure).

There is no such an excessively developed system of the quality evaluation in any country of the world. The designated control procedures solve various functional problems though their strategic target orientation contacts the assessing and ensuring a due quality of education. The problem of quality assurance is aggravated with bureaucratization expansion. Never-ending scheduled and unscheduled inspections, in many respects duplicating each other, distract the teachers from their pedagogical and scientific work. It is reasonable to minimize these control checking procedures. In this regard the refusal of state certification should be considered as a logical continuation of democratization begun in Kazakhstan in the system of higher education.

The reforms assume the student-centered training, flexible training programs, a considerable contingent of qualified teachers ready to realize these innovations. Unfortunately, in Kazakhstan the number of highly skilled staffs is insufficient in comparison with the contingent of students. The specific weight of doctors and candidates of science in the education system makes about 50%. The problem is aggravated with the fact that since 2011 in Kazakhstan there were liquidated the traditional postgraduate and doctoral studies, and the introduced western PhD doctoral studies are only adjusted. It is unlikely possible in such a situation to guarantee the quality higher education that acquired a mass character.



The present stage of upgrading higher school is integrated to emergence of a number of risks caused by a keen competition in the sphere of educational services in the conditions of the market economy, developing the Bologna Process in Kazakhstan and the knowledge-intensive economy. The main risks of successful upgrading higher education are connected with insufficient funding of higher school. Budget financing of higher education at the level of 0.3–0.4% of the GDP is extremely low in comparison with the European standard rates (1,5-2%) of the GDP). From there is a noncompetitive pay level of the staffs, deficit of highly-skilled scientific and pedagogical employees, widely practiced part-time job with damage to the training quality.

Standard managerial risks are caused by a frequent change of educational priorities. The undertaken reforms had a more chaotic character. On the system basis there were only replaced the Ministers of Education and Science (for the last 25 years 13 ministers were replaced), and the matter "of modernization remains to upgrade as large as life". The standard rates of the ratio of the staffs to the contingent of students established more than a quarter of the century ago, became outdated now. A high annual load of a teacher (900 hours) does not promote improving the educational process quality. As a result the creative educational process turns into an industrial conveyor for stamping a standard bachelor-contractor. It is necessary to refer an insufficient competence of the managerial personnel and a low performance of studies monitoring to standard managerial risks.

The updating of the competence-based approach is caused by the need of implementing GPIID-2 and the development of the Bologna Process in Kazakhstan. In Kazakhstan higher education as a part of the Soviet education system was formed on the knowledge paradigm. Educational programs of the first generations of SCES were formed according to the didactic triad "knowledge - abilities skills". At the same time the main emphasis was placed on transferring and assimilating knowledge. In the conditions of globalization and dynamically changing market there are demanded not knowledge for itself but competences of a specialist as a capability (readiness) to apply them successfully in the professional activity. Forming competencebased oriented educational programs is the main way of overcoming the gap between resulting effects of education and present requirements. Without denying the importance of the complex of knowledge and abilities, it focuses attention on achieving the integrated result that competence serves.

The main concept of the today's upgrading of higher education in line with the Bologna reforms is changing the net knowledge model by the competence-based model. Unfortunately, in the RK this problem has not yet become widely discussed. In the conditions of infinite reforms the competencebased approach in higher education is more often perceived as the next formal and bureaucratic loading having a decorative role. Is it really so? Apparently, such estimates arise owing to the deficit of competence in these questions.

Implementation of the competence-based approach is the most difficult task requiring evidence-based methodology of transformation of the qualification characteristic and professional competences of the graduate requirements into the content of an educational program.

In the Concept of life-long education there is important the transition from managing professions to managing professional qualifications. This problem is solved with the help of professional standards permitting to reveal the professional activity of specialists according to the structure of the technological process and succession of activities at various qualification levels in combination with the requirements to knowledge, abilities and competences. On the basis of professional standards and requirements of the real production sector there must be formed educational policy of the country and the system of certifying specialists. Professional and educational standards providing interrelation between professional training and the requirements of changing economy shall become a kernel of the national system of qualifications.

Developing a social partnership of higher education institutions and professional associations of employers in designing professional standards and practice-focused educational programs based on the graduate's competence-based model is to become the main vector of modernizing higher school.

The absence of professional standards in many directions constrains designing the competence-based focused educational programs and does not permit to provide an interface of procedures of the final assessment of the University graduates and certification of bachelors' qualification. Special sharpness
is felt in technical education where in connection with transition to the 4-year bachelor degree programs is obviously found the deficiency of practical training.

The main task of the higher school teacher in the context of the competence-based approach consists in that a student wanted to study, to plunge into the subject. Paraphrasing the words: "It is necessary to fight not for all but for everyone", in pedagogics "the teacher has to teach not all but everyone". In pedagogy it means the use of the individual person-focused approach in the course of training socially active experts with corresponding competences.

Forming the needed competences at students assumes the development of corresponding professional competences at teachers, too. This is a necessary condition of improving the quality and efficiency of pedagogical activities which assumes regular teachers' having various forms of advanced training, their active participation in scientific research in the sphere of professional activity.

Increasing the professional competence is an important condition of ensuring the international competence of the pedagogical personnel which is a necessary condition of integration of the Kazakhstan education system into the international educational space.

The competence-based approach in higher education strengthens integrative tendencies in the educational process. Implementation of the competence-based oriented programs will require creative interaction of teachers not only at the department but also at the inter-department level. There are needed coordinated actions of the staffs aimed at the integrated team result.

In the conditions of globalization higher education in Kazakhstan shall not become a factor of social stratification of the society. The Unified National Testing (UNT) as a factor of enhancement of the entire educational system promotes increasing availability of the quality education to citizens, irrespective of their social position and place of residence. Despite this merit, the UNT does not develop a system logical thinking and does not promote forming creative self-educational activities. The situation at schools is such that in the 10–11 forms the children do not practically study, they prepare for passing the UNT, they are trained. The reason is quite explainable: the school is estimated by the results of the UNT, by the number of those who entered the University. The UNT

results are constantly improved, but the level of the system knowledge leaves much to be desired. The UNT as an indicator of the level of education and readiness of a school leaver from the point of view of equal starting opportunities of entering a higher education institution is quite a good tool. It should be improved in the direction of leaving from guessing towards developing logical thinking on the basis of the system knowledge.

Higher education is the basis of the social and economic development of the country. Therefore the state shall track the quality of education irrespective of the economy condition and the level of budget financing.

The Kazakhstan higher education within the Bologna Process became three-level. In the context of forming the all-European educational process these changes are integrated to a number of inevitable challenges. There are needed scientific and methodological reasons for the undertaken reforms [3].

The expanded autonomy of higher education institutions in forming educational programs and selecting technologies of training are fixed legislatively. The expansion of the degree of freedom assumes increased requirements to the quality of higher education and the need for its objective confirmation [4]. It makes necessary carrying out a systematic monitoring of the efficiency of higher education institutions activities. In this aspect a special role is assigned to independent accreditation of higher education institutions and educational programs.

Since 2017 there will be performed a complete transition from the state certification of higher education institutions to accreditation. It provides developing an effective system of quality assurance of education including both internal quality assurance and external quality assurance [5].

The crossing point of the interests of higher education institutions and employers becomes independent accreditation of educational organizations and educational programs. Accreditation permits to estimate the activities of a higher education institutions not only in the context of quality assurance, but also from the position of satisfying all interested consumers of educational services (students, employers). It becomes a working tool demanded and attractive to various target audiences. In the course of accreditation higher education institutions reveal strengths of the activities and get competitive advantages in the education market. The revealed weaknesses permit

a higher education institution to correct its educational policy and to make strategically correct decisions for training demanded specialists. The procedure of accreditation forces the business community to become not only a customer but also an appraiser of the quality of educational services (knowledge, abilities and professional competences).

Higher education institutions and the scientific and pedagogical public supported actively the institution of accreditation as a new model of the independent education quality evaluation. Since 2012 only through the NAAR there have been accredited more than 400 educational programs and more than 30 Kazakhstan higher education institutions passed successfully institutional accreditation.

The processes of accreditation begun in Kazakhstan represent a public professional evaluation of the education quality which essential difference is its independence, objectivity and publicity. Such a policy of quality assurance causes trust from higher education institutions, promotes increase in their competitive advantages: the appeal for entrants and demand at employers.

The processes of globalization are capable to work in the multi-vector directions [6]. The active market rhetoric, expansion of the paid sector of higher education and the academic autonomy of higher education institutions impact negatively the quality. There is leveled the most important thesis of higher education as a public benefit to please to market conditions. We should not to be guided blindly by the western samples without the Kazakhstan realities. The effectiveness of the undertaken reforms depends on the accurate statement of criterion functions and scientifically based methodology of step-bystep upgrade of higher school in the direction of quality assurance and competitiveness. It is necessary to bring the level of budget financing of higher school to the Central European standard rates, to provide measures for increasing the social status of the high school teacher, developing the conditions for the fixed growth of the professional competence.

References

1. Pak Yu. Not to seem but to become. Modernization potential of higher school: problems and solutions // Modern education. – 2014. – $N_{\rm D}$ 1.

2. Pak Yu.N., Pogrebitskaya M.V., Pak D.Yu. Institutional aspects of higher school of Kazakhstan modernization // University management: practice and analysis. -2015. -N 1.

3. Pak Yu.N., Gazaliyev A.M. The Bologna Process and Kazakhstan realities. – Karaganda: KSTU, 2014.

4. Faktorovich A.A. Education quality management at higher education institution: external calls and internal reserves // Pedagogics. -2015. $-N_{\text{D}} 5$.

5. The state program of education development of the Republic of Kazakhstan for 2016–2019: The decree of the RK President N_{2} 205 of 3.1.2016.

6. Baydenko V.I. The Bologna Process: the present stage // Higher education in Russia. -2015. -N 10.

FEATURES OF THE MODULE-RATING TECHNOLOGY IN TEACHING "CHEMISTRY"

Klyuchnikova N.V., Denisova L.V. Belgorod State Technological University named after V.G. Shoukhov, Belgorod, e-mail: 4494.55@mail.ru

It is shown that the module-rating system in high school is a technology of educational process, in which the learning objectives is a set of professional competencies of the student, as a means of achieving it is the modular nature of the content.

When planning and implementing a training module – rating technology teacher takes into account all factors that may affect student learning (psychological features, basic knowledge, teamwork, etc.). Found that this technology contributes to the development of thinking, imagination, attention, memory, ability to introspect, the Organization of independent work of students, team – building. Demonstrates that when you split the content of educational material studied discipline instructor, you must build the classes to help students discover, discern its internal potential, develop not only thinking, imagination, memory and communication skills of students.

Thus, it is shown that the module – rating technology allows the student to prepare for the exam, generates adequate self – esteem, encourage independent work and helps to increase competitiveness in their studies.

A transition on two – level education demands of new educational technologies. The realization of this approach in higher education allows the module – rating system for assessing students' knowledge. Advantages and disadvantages of this technology explored deeply enough, as evidenced by the large number of publications on this topic [1-2].

Crucial role to play in this system belongs to the high school teacher's creative use of the experience of psychological and pedagogical interaction with students. For optimization of the tasks which are set before the students, teacher must clearly know the basics framework of psychology and pedagogies. Knowledge of the characteristics of the mentality of students should be able to use in the educational process.

The module – rating technology puts students to work regularly in the sphere of education, increases the interest in its outcome, to enhance the role, value and efficiency of independent work in the educational process.

Analysis of the literature shows that of all the world's high school assessment training knowledge and technology advances are substantial advantages technologies based on students' rating of the individual determined by aggregate assessments in various control points in the discipline. Rating control is the main component of the module – rating technology and provides for the possibility of a differentiated approach to the control of knowledge.

The psychological essence of rankings is that it addresses the intellectual, emotional, willed, motivational, value – orientation of the student, affects the formation of adequate self-esteem and creates the ability to introspect, self-organization of their independent work.

Rating control stimulates daily independent work contributes to increased competitiveness in studies, increased interest in the subject studied. Use the rating allows you to comply with the requirements of reasonableness and transparency of assessments. Moreover, a student clearly knows a ratings and awards at the very beginning of the discipline. Such control is necessary for the implementation of the feedback when adjusting training. Rational organization of the educational process and control of performance are two sides of a common learning process [3, 4].

Methodology. In Belgorod State Technological University named after V.G. Shoukhov at the Department of inorganic chemistry it is developed the technological map of the discipline of "chemistry", which establishes the maximum number of points equal to 100. Points are awarded to the student for the mandatory educational works, some of them (up to 10%) and to assess such personal qualities as a discipline, responsibility, initiative, timely execution of assignments, etc. Points for personal qualities are the lead teacher in the exam that can significantly increase a student's final grade for the discipline.

The main part. At designing of the modulerating technology, it is necessary to consider that the result of the education is defined not only by student's book, but teaching position, his training methods, his professionalism, the atmosphere that is created in the audience, the relationship between teachers and students and others. Also teacher's role, its place in class and, of course, the student's functions and their activities depend on teacher's position.

In the classroom students can actively communicate with each other (on certain phases of occupation), collaboration with teacher and student use catechetical method of training, front work with the training team. Working in groups, students also may discuss all matters with each other and, thus, developing an ethic of business communication. At "implementation" of module-rating technology it is necessary to provide students with the opportunity to interact in class with each other and with the teacher on an equal footing, to express themselves, develop students' ability to gather information, its analysis and synthesis, to develop the ability to not only achieve results of its own activities, but also to be able to evaluate them.

Stimulating role of module-rating technology plays a student pass or exam in semester depending on the amount of points collected. And we can speak about not only the assessment of "excellent" but less high positive assessments. At the Department of inorganic chemistry students are trained in almost all professions, therefore, depending on the complexity, the discipline of chemistry contains 3–5 modules, control measures which are required for the student. The distribution of controls is built during the semester so that the student each week gets points for some kind of training. The sum of points on all modules of a rating for the discipline for the semester evaluation scores current student work takes into account the quality of the work and its timeliness.

Score in points of the current student work takes into account the quality of the work and its timeliness. The basis of assessment learning modules disciplines are based on current control of scores of students in the semester, summed for all types of training activities. The final appraisal for the discipline of chemistry is an exam, which is held after the planned student teaching works. The minimum number of points accumulated during the semester and to take to the exam, set within 48.

Because the program "chemistry" discipline involves the examination, at the final qualification imposed additional module and a final control, which in this case is a mandatory event. This control is carried out during the final semester and it is 30 points out of 100. Thus, 70 points a student can earn for work in term 1 and 30 points based on final inspection. As a result, when a student on the sum of all 61 or more modules are inadmissible.

It should be noted that according to the results of the final evaluation the student won't be able to get the final assessment on the discipline which is below, then during the semester for the modules. Student, received the minimum number of semester credits (48–50 points) even while getting maximum scores on the exam (30 points) cannot qualify for an assessment at the rate of this approach is the motivating factor for students throughout the semester, students who do not pass the control event, continue to work on it within the time period established by the Department, prior to its execution.

Department of inorganic chemistry, of Belgorod State Technological University named after V.G. Shoukhov developed evaluation tools for monitoring, which takes into account the quality and timeliness of all types of training activities. At the beginning of the semester the students get acquainted with the system and form of rhenium in the form of a promotion and points for personality that contributes to the rational organization of the educational process and to monitor performance. At the Department of inorganic chemistry students are trained in almost all professions, therefore, depending on the complexity, the discipline of chemistry contains 3–5 modules, monitoring activities which are indispensable for the distribution of the student built during the semester so that the student each week gets points for some kind of training. Basic kinds of control of knowledges, abilities and skills during of every module are laboratory works, homework, calculations and graphically tasks and computer testing. The sum of points on all modules forms a rating system on for the semester.

The assessment of points of the current student is work takes into account the quality of the work and the timeliness. Basis of assessment learning modules disciplines are based on current control of scores of students in the semester, summed for all types of educational works. The final certification on the discipline of chemistry is an exam, which is held after the planned student teaching works. The minimum number of points accumulated during the semester and to take to the exam set within 48. Because the program "chemistry" discipline involves the examination, at the final qualification imposed additional module and a final control, which in this case is a mandatory event. This control is carried out during the final semester and it is 30 points out of 100.

Therefore, we can say that the module – rating system affect the formation of adequate student self – esteem, stimulates independent work and helps to increase competitiveness in their studies.

References

1. Polat E.S. New pedagogical and information technologies in education. -M.: Academy, 2009. -270 p.

2. Crocker L., Algina J., Introduction to classical and modern test theory. – $M_{\rm .:}$ Logos, 2010. – 663 p.

3. Klyuchnikova N.V., Denisova L.V. // Herald of the Belgorod State Technological University named after V.G. Shukhov. -2014. $-N \le 5$. -P. 232–234.

4. Klyuchnikova N.V., Denisova L.V. New approaches in training during the transition on two – level system of education in high school // Collection of scientific papers Sworld. – 2012. – T. 11. – N_{2} 2. – P. 76–80.

The work is submitted to the International Scientific Conference «Modern science education», France (Paris), October, 19–26, 2016, came to the editorial office on 18.09.2016.

UNIVERSITY E-LEARNING: DYNAMICS OF STUDENTS' ABSTRACT THINKING DEVELOPMENT

Snegireva L.V.

Kursk State Medical University, Kursk, e-mail: sneglv1@gmail.com

The author of the article analysis the e-learning role in medical university students' abstract thinking development. The article made on the research experimental material represents indicators of students skills to abstract from the irrelevant objects or

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

phenomena details, the dynamics of students' abstract thinking development throughout the mathematical e-learning process in medical school. The author shows that the usage of modern information technologies in the learning process allows to influence actively on students' abstract thinking development, providing approximately 20% of all students to a higher level of abilities development to abstract from non-essential properties and characteristics of objects and phenomena, which is highly important throughout the students cognitive activities development and acts as a guarantee of successful self-education and inclusion into the system of continuous education where students should solve professional tasks by themselves, passing the way "analysissynthesis-abstraction- generalization".

Abstract thinking is human nature unique attribute that allows the individual to abstract from the irrelevant objects or phenomena details, highlighting the most significant and characteristic features. Developed abstract thinking allows person to find creative ways of solving problems, uncommon approaches of reaching academic, practical and professional goals. Thus, the development of abstractlogical thinking is the basic condition for professional growth, successful learning and continuing education throughout life.

The problem of the students' abstract thinking development is studied at many levels [1, 2, 3]. However, the question of abstract thinking formation with the help of modern information and computer technologies has not found its proper research and understanding [4, 5, 6].

That's why, the aim of our research is defined as studies of abstract thinking development by using new information technologies in e-learning process at the University. As mathematics is the most abstract science of all known, we decided to explore the students' abstract thinking formation and development throughout the mathematics elearning process.

We chose the clinical psychology faculty students of medical university as an object of our research as students' abstract thinking development is extremely important while searching for scientific psychological methods, analysis and interpretation of psychological research results.

We can point out several tasks of our research:

- to study clinical psychology students' abstract thinking development at the initial stage of mathematics e-learning;

- to analyze clinical psychology students' abstract thinking development at the final stage of mathematics e-learning.

Materials and methods of research. The testing of 30 first-year and second-year clinical psychology students was carried out. First-year students were tested as the starters of mathematics e-learning. Second-year clinical psychology faculty students were involved into mathematical e-learn-

ing testing after passing the mathematical course examination.

The experiment was held in constant conditions for both groups of students: the research was held at 11 a.m. in the academic auditory. The research duration was about 20 minutes. The clinical psychology faculty students performed the testing independently without using any electronic devices. The testing was built on the basis of Atmhauer intelligence structure test including the scale of mathematical abilities determination.

Results of research and their discussion. As a result of students' abstract thinking development research at the initial stage of mathematics e-learning we have identified 7% of students with average ability to abstract from non-essential properties and characteristics of objects and phenomena. Highly developed ability to use abstract symbols and notations has not been demonstrated by anyone, from students at the initial stage of mathematics e-learning. According to the test results large group of students at the initial stage of mathematics e-learning had low level of abstract thinking development. So, half of the students at the mathematics e-learning initial stage (50%) had problems with operating abstract symbols and concepts. And 43 % of first year students number at a medium - low level of abstract thinking development did not have properly formed abilities to transfer information about real objects to symbols.

For students' abstract thinking development dynamics research throughout mathematics elearning course, we carried out the analysis of second year students testing results to abstraction from objects and phenomena irrelevant properties. The research results show that mathematics e-learning develops students' abstract thinking. E-learning has transferred 19% of all students to a higher level of abilities development to perform operations with abstract symbols and concepts.

Number of students with the low level of abstract thinking development was decreased from 50% to 31% at the final stage of mathematics e-learning process. At the same time, the usage of mathematics e-learning teaching instruments helped to expand the group of students with average abilities development level to transfer information about real objects and characters from 7% to 19% (Figure).

Mathematics e-learning delivered 7% growth (from 43 to 50%) of all students' number at a medium – low level of abilities development to abstraction from objects and phenomena irrelevant properties. This fact, in our view, can surely be a confirmation of e-learning effectiveness in students' abstract -logical thinking development.

Test results comparison in each test assignment shows that 80% of all students coped with their tasks much better at the mathematics e-learning final stage (Table).



Comparative analysis of students' abstract thinking development level before and after mathematics e-learning: 1 – high level of abstract thinking development; 2 – average level of abstract thinking development; 3 – low-average level of abstract thinking development; 4 – low level of abstract thinking development (Dark color indicates students' results before mathematics e-learning. Grey color indicates students' results after mathematics e-learning)

The testing results comparison separately on each task offered to examinees

	The number of examinees coped with test tasks surely (%)					
The task number offered	2 year – students at the final stage	1 year – students at the initial stage				
to examinees	of mathematics e-learning	of mathematics e-learning				
1.	56%	43 %				
2.	38%	29%				
3.	19%	36%				
4.	44%	36%				
5.	44%	21%				
6.	25%	29%				
7.	19%	14%				
8.	50%	29%				
9.	63 %	57%				
10.	56%	43 %				

More than 40% of second year students gave the correct answers in seven out of ten (70%) tasks of the test, which is two times higher rate than at the beginning of mathematics e-learning. 40% of second year examinees demonstrated fluency in transferring information about real objects to abstract symbols at the mathematics e-learning final stage, surpassing 30% rate of the first year students. Less than third of senior students number gave the correct answer just in 30% of the offered tasks, compared to 50% of the questions in the initial phase of e-learning.

Thus, all the research results allow to make a conclusion about abstract thinking development positive dynamics throughout mathematics e-learning process, transferring about fifth part of students to a higher level of abilities development to USE abstract symbols and notation. The research results can truly serve as a reliable proof of the mathematics e-learning effectiveness in students' mathematical abilities development. We hope, it will act as the momentum for the introduction of new and widespread usage of the familiar elearning forms and methods in educational process of higher educational institutions.

References

1. Opolev P.V. Problem of formation of abstract thinking of students in terms of preparation for test // Active learning – an innovative component of professional (engineering) educa-

tion: a collection of articles on materials of the interuniversity scientific-practical conference (Omsk, 31 January-01 February, 2007). – Omsk, 2007. – P. 196–199.

2. Sekinaeva B.S. Humanitarian potential of mathematics in the modern University // Modern problems of science and education. -2014. $-N_{2}$ 6. -P. 886.

3. Shirokova O.A. Development of abstract thinking and research abilities in teaching object-oriented and visual programming // Mathematical education in school and University: theory and practice: proceedings of the IV International scientific-practical conference dedicated to the 210th anniversary of Kazan University and mathematics (Kazan, 28–29 November 2014). – Kazan, 2014. – P. 277–280.

4. Snegireva L.V. Analysis of mathematical competence mastering as a part of professional competence of medical university clinical psychology faculty students at different educational levels // International journal of applied and fundamental research. $-2016. - N_{\odot} 5. - P. 322-325.$

5. Snegireva L.V. The e-learning as an instrument of medical students' mathematical abilities development // Modern problems of science and education. -2016. $-N_{\odot}$ 3; URL: http:// www.science-education.ru/article/view?id=24493 (the date of access: 13.05.2016).

6. Snegireva L.V. The formation of the main structural components of medical students' mathematical competence throughout the e-learning process // Modern high technologies. – $2016. - N_{\odot} = 8-2. - P. 363-367.$

The work is submitted to the International Scientific Conference «Research on the priority of higher education on-directions of science and technology», United Arab Emirates (Dubai), October, 15–22, 2016, came to the editorial office on 04.10.2016.

ANALYTICAL CONSTRUCTION "-QY (-QI, -KY, -KI) KEL"

Doskeeva B.Zh.

Asfendiyarov Kazakh National Medical University, Almaty, e-mail: doskeeva_b@mail.ru

The article studies the presumptions and arguments of turkologists on the ways of formation and development of the structure -qy (-qi, -ky, -ki), the history of its study, ancient Turkic scripts, its functions in medieval monuments. This grammatical form that once was used both as a verb and a noun, now conveys the meaning of an intention being added to the predicative bearing the main sense, and pairing with the auxiliary verb *kel* and refers to the paradigm of an optative mood. The affixes -qy (-qi, -ky, -ki) reflect completely different link with the root compared to other affixes forming the noun of action. The article analyses in detail that that the main feature of this form is the auxiliary verb *kel* being always used to convey the meaning of a desire, intention and for the auxiliary verb *kel* to be in the singular number of the third person.

Keywords: affix, analytical formant, scientific works, the history of genesis

In Kazakh language, an optative mood is formed analytically, by adding the suffixes *-qy* (*-qi*, *-ky*, *-ki*) to the main, derivative and negative verb forms, paired with an auxiliary verb *kel*.

In school and university textbooks these affixes refer to derivative suffixes that create new personalized words by adding to the root of the verb. For example: *sysprqy, burqy, shalqy, ashytky, kondyrqy, etc.*

Professor A.Yskakov indicates three different peculiarities of these suffixes: "By means of these forms we can create a derivative noun from the verb, a verb from the verb (for example: *zhulky*, *atky*, *syrqy*, etc.), an adjective from the verb (for example: *zhinaky*, *buralky*, *etc.*)" [12, 154].

Professor M. Tomanov: "...the researchers of ancient written languages point to two main features of the form" (-qu):

1. Denomination of the action, process.

2. Using this form in predicative relations, inform the executor of the action of possibilities and obligations.

"We can notice that the latter feature is very conformable with "-*qy keledi*" in Kazakh language" – says the scientist [74, 64–65].

The scientist, having analyzed the works of Mahmud Kashgari "Diwan lughat al-Turk", explains that the affixes "qylyk, uqly" used in it are the components, consisting of the elements "-qy-lyk, uq-ly"; he explains that the combinations used in M. Kashgari's work mean the following: *barqulyk erdi* – intending to go, *turqulyk erdi* – intending to live in this place; the complements -qy, (or -ky) are the complements to the nouns of action. That is, M. Kashgari's materials show the ways of forming an optative mood and also prove that this type of optative mood is formed not from the underived verb, but from the forms of action nouns [14, 106–107].

In his work, Kyrgyz scientist M. Yunusaliev proves in detail that phonetic variants of the af-

fixes -qy, -qi, -ky, -ki occur in form of -ky, -ku, -qy, -ki, -qi and that they are used to create personal words and the category of verb [75, 133].

The affixes ky, -ki, -qy, -qi are clearly the ancient forms. These forms are traced in the language of medieval monuments in the form of -ku, -qiu, -qi, -qu [89, 228–231].

The scientist A. Ibatov found out that in the poem of the XIV century «Khosrow and Shirin» 58 words were formed by means of affixes *-qu,-qiu*, and was reproduced in eight different versions (*-qu, -qiu, -kiu, -ky, -yk, -uq, -q, -qa*) [77, 107–108].

The affixes -qu,-qiu used to form action nouns from non-derivative verbs were often used in the poem of "Khosrow and Shirin", as well as in many mediaeval monuments, for example, in heritages like "Gulistan bit-turki", "Mukhabbatname", "Nakhdzh al-Faradis". However, in historical monuments this affix was used separately, without the auxiliary verb "kel". For example, yokalqular kamyqlary yokalqay – let what is to be lost to be lost; imdi chara tabmazman kutulqu – no means left to escape. Here, these forms are used both as a verb and an adjective.

A famous turcologist E.V. Sevortyan indicated that the suffixes *-kala*, *-kyl*, meaning repeating actions, consist of suffixes *-ka*, *-ky*, *-la*; N.Z. Gadzhieva and B.A. Serebrennikov refer this form to a collective sense in Turkic languages: "this affix indicates to the names of twins, for example, legs, ears. It is also peculiar to the affix *-lyk*, giving a collective plural meaning (in the Tatar language "kayanlyk" means "from the birch").

The scientists write: "Based on this, we can assume that the affix $q(\kappa)$ primarily gives the sense of collective plurality. Further it acquired the meaning of "short". And finally, it got the meaning of modality, an intention to perform certain actions" [79, 103; 79–4–5].

A. Ibatov in his scientific article "The traces of historical formation of the affixes *-qy*, *-qi*, *-ky*, *-ki* on the way of forming derivative verbs" discovered the patterns of affixes in forming the words, and proved that these affixes, connecting with the non-derivative verbs, form derived dead roots [77, 106–112].

Summing up the above, it is necessary to note that the linguistic materials prove that the suffixes -kv, -ki, -qv, -qi used to form optative mood are the ancient affixes that were used as *qy*. -ki, -qu, -gu, -qy, -qi in ancient monuments, and were used as a verb as well. Professor S. Isaev on these peculiarities of this affix said the following: "The main reason for their being a noun and a verb at the same time lies in the fact that everything depends on what parts of speech the root that is added an affix belongs to. It could be under the influence of Turkic syncretism, the time when all affixes were not fully formed, that is, those early times, when the words describing movements, actions, things and their properties were very similar to one another, and it was possible to distinguish them only by their semantic properties and intonations when spoken aloud. This phenomenon is typical of Kazakh language as well" [18, 266–267].

Modern Kazakh language has the optative mood of the verb that is formed by adding possessive forms of affixes and auxiliary verb *kel* to these affixes.

Despite the fact that at a time this form had been used as a verb and as a noun, at present, when it has been formed as a morphological formant of a nominal word, it can no more be used as a verb formant and is always used with an auxiliary verb *kel*.

An optative mood with the suffixes *-qy*, *-qi*, *-ky*, *-ki* and combined with an auxiliary verb *kel* is one of the commonly used derivative form. It is frequently found in literary works, spoken language, print publication, TV, radio, etc.

As this from occurs through combination of the main and auxiliary verbs, it refers to analytical forms. Affixes -qv. -qi, -kv. -ki are added to the main verbs and then the auxiliary verb kel is added. The affixes -qy, -qi, -ky, -ki completely differ from other affixes with their connection with the root. The main reason is that the affixes (-qy, -qi, -ky, -ki) are closely connected with the auxiliary verb kel. If they will be used in combination with other auxiliary verbs, they cannot convey the meaning of "a wish, desire". For example, the combinations aitkym turady, aitkym salady, aitkym shygady don't convey any meaning. This form cannot be combined with any other auxiliary verb. In order to convey the meaning of a wish, desire, intention it should always be combined with the auxiliary verb *kel*. Without this verb there will be no sense. That's why we can say that the affixes (*-qy*, *-qi*, *-ky*, *-ki*) and the auxiliary verb *kel* are a complete unit.

The formants (-ky, -ki, -qy, -qi) kel are added together to the semantic verb. Along with that, a combination of an auxiliary verb kel without the affixes (-qv, -qi, -ky, -ki) added to the semantic verb would not bear a sense. For example, if we deprive the phrase soileqim keledi of the affix -qi, we will have soile keledi, which is of no meaning. In this combination the verb soile takes the formant kel not as an individual lexical and grammatical form, but as a morpheme. The auxiliary verb kel, deprived of its lexical meaning, is used as a semantic and grammatical supplement to the main verb. For example, *1. Al, keibireuler* ogan otkenning zhaman adetin koskysy keledi. Bakastykty, baktalastykty kozdyrgysy keledi (And someone wants to carry over bad habits. They want to stir up the rivalry).

These sentences show the intentions, desires and aims of certain subjects in the third person through such phrases as "koskysy keledi, kozdyrqysy keledi". Here the word *keledi* is used not in the literal meaning; at first, the semantic verbs (kos, kozdyr) are added affixes -qy, -ky, then they are added a possessive form of affix (-sy), and only after that we put the word *kel* in the future tense to attain the meaning of an intent, aim and desire.

3. Baluan dzhigit kureskisi keldi. Onerin korsetkisi keldi. Zhuzinde zhylylyk kana bar (The wrestler wants to fight. He wants to show his dexterity. He emanates warmth).

In this sentence the wrestler's wish was conveyed through the formant -ki kel. These sentences give us a clear understanding that the formants (-qy, -qi, -ky, -ki) kel can be used in conjunction with the action verbs associated only with the desires of an animate subject. For example, we cannot use the combinations like "kalamnyn zhaząvsy keledi" (the pen wants to write) or "terezenin syngysy kelmeidi" (the window doesn't want to break) as the subject is inanimate. That means that this formant is combined only with verbs describing an internal state of feeling of the subject. Moreover, the formant -qy (-qi, -ky, -ki) kel gives an idea of the internal feelings, desires, intentions, dreams of the subject, but has no relation to reality. For example, the sentence "onyn suda zhuzqisi keledi" (he wants to swim) shows only the intention of a subject to swim, but doesn't show if he swam or is swimming at the moment. The subject's dream may never come true.

Due to the constant presence of a possessive affix, we can determine the subject of the sentence through the nominal word in a genitive case; if there is no such word, his person is determined through one of the possessive affixes peculiar to three persons. Some turkologists and Kazakh language specialists hold the view that some forms of the verb conjugate via possessive affixes. «The form of the optative mood is a specially conjugated form of a verb. An optative mood is connected with the main verb by adding possessive affixes to the form -qy, -qi, -ky, -ki, combined with the auxiliary verb keldi or keledi, the compound verb is conjugated using the possessive affix, the performer of the action, the person (personal pronoun) is put not into a nominative case, but a genitive» [18, 131].

And the auxiliary verb *kel* is always in the third person in a singular number, however, it doesn't have the sense of a third person. This sense disappeared. Professor S. Isaev wrote the following on it: It is a predicate that ends the sentence in an orderly manner. It has a zero form in the third person with a personal affix, and it is not used in another person, as formally its grammatical subject is used as the definition in an attractive form» [18, 131].

The person of a verb here is conveyed via possessive form. This feature is connected with the fact that the action is sometimes conveyed as a verb and sometimes as a noun.

All the works on the features of impersonal sentences in the Kazakh language mention one feature – the predicate in these sentences is always in the third person; besides, the impersonal sentences doesn't have the subject, the subject of the action performs a different role in the sentence. Though the predicate of the sentence is in third person, its logical person (as it is a grammatical person) is determined not only in the third person, but in the first and second person.

Logical subject is present in the sentences with abovementioned analytical formant. It can be in one of the three persons. For example:

1. Abishting okshau oilaryn Abaidyng ugyna tuskisi keldi. (Abay wanted to figure out covert thoughts of Abish).

2. *Ozimning de aitkym kep zhuretin, irkilgenim zhok.* (I was going to say that, so I did not hesitate). 3. *Nege ekeni belgisiz Zhaniyanyn bugin bargysy kelmedi.* (I don't know why, but Zhaniya did not want to go).

In the first, second sentences, the subjects in the third person are Abay, Zhaniya, and the subject is in the first person in third sentence (ozim). These persons in the sentences are the subjects of action; the grammatical subject is missing in the sentences, as the words which can be a grammatical subject (Abay, Zhaniya and me) are not in the nominative case, but in the genitive case with a possessive affix. If to check and analyze the grammatical link of words in a sentence, we will not be able to find the subject, moreover, for sentences with this structure it's impossible. «The main reason for the absence of subject lies in the structure of a compound verb, semantic meanings of words in their composition» [81, 10]

The combination of predicates on their structure can make a simple sentence. For example, let's take the sentence "korqim keledi". It seems that this sentence has both the subject and the predicate. However, parsing the sentence, we can prove that it is not true. We cannot consider this structure as an individual sentence or a compound predicate. Determining the parts of speech in the combination "korgim keledi", the questions "nem keledi?" – "korqim", "korqim kaitedi?" – "keledi" are not correct as the word "korgim" is not used separately in the sentences and cannot be a part of the speech. The words with possessive affixes stand in first, second and third persons and mean a desire, intention. As the word *korgim* is a component of the predicate and doesn't have a full meaning, it accordingly cannot be a grammatical subject. The main feature of impersonal sentences is an inability to be the grammatical subject. There is no grammatical subject in sentences above. G. Madina who studied impersonal sentences in Kazakh language, writes: "In impersonal sentences the subjects of the action are obvious, and they occur in two cases. The first are determined through subjects – personal pronouns of the genitive case, I, II, III persons (another word is used instead of the pronoun in III person), that are connected with the verbs in an optative mood. Typically, these are the subjects with possessive affixes. Similarly, an action subject of impersonal sentences is obvious. It is connected with two cases represented in a sentence. Firstly, the subject is determined by the personal pronouns in genitive case connected with possessive affixes in 1, 2, 3 persons added to the predicate in optative mood" [81, 34].

Sometimes the pronouns in genitive case following the example of impersonal sentences occur in nominal form. This fact in turn confirms that the word in genitive case is used as a subject. For example:

1. Abay balasy ozine ondai kurmet zhasaqysy kelgen zhok (Abay's son did not want that kind of reverence).

2. Bul kisi kesheqi urdisten azhyragysy kelmeidi (This person doesn't want to loose hold of this procedure).

In these sentences the affixes of genitive case are dropped. But despite this, the meaning of the sentence is preserved. If to add genitive case affixes *-nyng*, *-ning*, *-dyng*, *-ding*, *-tyng*, *-ting* to the subject in sentences "Abay's son did not want that kind of reverence. This person doesn't want to loose hold of this procedure", we get the sentences with unchanged meaning. Despite the fact that in these examples the words in a genitive case take a certain position, they perform the function of a subject on meaning.

The omission of affixes in the words of genitive case that perform the function of a logical subject give an opportunity to determine the subject. We'll try to explain in two sentences. For example, *"Kopshilik Sanany tyngdaqysy* *keledi*" (The majority wants to listen to Sana) and "*Kopshilikting Sanany tyngdaqysy keldi*" (The majority wanted to listen to Sana). The subject is obvious in the first sentence, and is inconspicuous in the second sentence, but the desire in it is demonstrated stronger.

References

1. Yskakov A. Modern Kazakh language. – Almaty: Ana tili, 1991. – 383 p. – P. 154.

2. Tomanov M. Historical grammar of Kazakh language. – Almaty: Mektep, 1981. – P. 64–65, 106–107. – 207 p.

3. Yunusaliev M. Kyrgyz lexicology. Part I. – Frunze: Kyr. State ped. pub, 1959. – 248 p. – P. 133.

4. Aidarova G., Kuryshzhanov A., Tomanov M. The language of ancient Turkic scripts. – Almaty: Mektep, 1971. – 271 p. – P. 228–231.

5. Ibatov A. Historical traces of formation of the affixes -кы, -кі, -гы, - гі, – forming derivative words with the verb roots. Books: Investigations on Kazakh grammar. – Almaty: Gylym, 1975. – 150 p. – Р. 106–112

6. Severotyan E.V. Affixes of personal word formation in Azerbaijan language. – M.: Nauka, 1996. – 438 p. – P. 103.

7. Gadjieva, N.Z., Serebrennikov, B.A. The genesis of affixes with a modal meaning in Turkic languages // Soviet turkology. $-1974. - N_{\odot} I. - P. 3-12.$

8. Isaev S. The grammatical features of the words in modern Kazakh language. – Almaty:Rauan, 1998. – 304 p. – P. 266–267, 131.

9. Saduakhasov Zh. The category of person of the verbs in Kazakh language. – Almaty: Kazakhstan, 1994. – 128 p. – P. 108.

LITERARY SPACE ARCHITECTONICS IN THE NOVEL "THE BROTHERS KARAMAZOV" BY F.M. DOSTOYEVSKY

Ogneva E.A.

Belgorod State National Research University, Belgorod, e-mail: Ogneva@bsu.edu.ru

The article deals with the space segment of the literary conceptual sphere in order to identify the specificity of space structural architectonics of the text. The parameters of space contextual models as a unit of proxemes which represent the horizontally and the vertically oriented objects of literary space in the novel "The Brothers Karamazov" by F.M. Dostoyevsky are identified. The role of culturally marked proxemes in the space model structures is clarified. The necessity of comprehensive study of space models role in the researches of the literary characters specificity is clarified.

Keywords: literary conceptual sphere, literary space, text, space architectonics, proxeme

One of the actual issues in the contemporary linguistics is verbalization processes forming the linguistic model of the world. The model of the world is researched as the unity of language signs to represent the world architectonics specificity. According to the philosophical conceptualization of the cultural categories the language world model becomes the intercultural communication base.

The research of the intercultural communication aspects is a way to the understanding among peoples. As a consequence such researches are the way to cross-cultural dialogues. Having verbalized the cultural specificity the language world view has a narrative effect, while the primary world model has explanatory power, but, according to N.F. Alefirenko "In both cases, the unit of explanation and description is the concept <...> as an operational unit of mentality, which is denoted by the word, phrase or phraseology <...>, and as the base element performs the model in world structure" [2, p. 25].

The cultural relativity of language world view is realized in the form variability and values system categorization, due to the fact that "the language and culture are closely connected by some intermediate education, which is ideally implemented in the language of the meaning, <...> providing the ontological unity of language and culture" [9, p. 54].

The meaning represents the "specific character of life and culture in the social and national people identity, which can be described in the text" [12, p. 34]. Following I.R. Galperin, "text theory has two research ways: firstly, forming of the text grammar rules to model any text; secondly, forming of the general text theory by the textual structure studying to identify the style regularity of speech acts to discover categorical characters of any text" [4, p. 8].

According to N.A. Panasenko "the author has encoded the information and sent it to the

reader. This information is transformed by system of images, characters, plot, which is encoded by language means and stylistic devices (lexical and grammatical expression)" [11, p. 99]. Text can be interpreted as the text world model to project the reality and unreality. "Literary text as the people being reconstruction format is the complex research construct" [Ogneva 2014].

We consider the literary text as a form of literary world view, which is formed according to the influence of complex cognitive processes, including space conceptualization into the conceptual sphere "forming a space literary world view as an integral component world view" [7, p. 228].

Literary world view is actualized in the literary text, which is a unit of literary concepts into the conceptual sphere. Literary concepts are defined as component of literary conceptual sphere, including those mental signs and events that are kept by the people historical memory. In the author's mind literary concepts are the cognitive-pragmatic significants for the plot development to create the cognitive textual aura.

It is obvious that at the present time there is a need to study the space world parameters not so much based on the lexicographical data, but in the literary context too.

Contemporary linguistics has the wide methodological spectrum to research any issue. One of the actual issues is to identify the role of literary space units into the literary conceptual sphere architectonics in the character description. Thus, in spite of the wide spectrum linguistic researches there is not unique linguocognitive conception of text worlds models to interpret any textual segment, including the issue of literary space interpreting, but we need having such conception.

Methodological base of contemporary linguistics is the synergy of traditional and

innovative methodologies as the base to research successfully any actual issues, which are studying by different scientific schools all over the world. Such methodological synergy is the base to precise some hypotheses and conceptions interpreting lingual worldview.

The cognitive-linguistic vector of researches has the large explanatory potential. This cognitive-linguistic is the base for new perspectives in the literary text studies as a means of fixation, storage, representation of knowledge and experience cultural-linguistic ethnic space.

The cultural-linguistic ethnic space specificity can be studied in the different books because "across the world there are too many places, where the reader had never been, and wouldn't have been, so books, culture, knowledge are a great compensation in the case of limited space. Books can expand it" [6, p. 28].

The diversity of Russian space world view which represented on the literary pages, provides the extensive material for complex cognitive-hermeneutic text analysis of space models in order to identify the dynamics of this category verbalized environmental markers in the text, because according to Yu. Lotman, "the space text structure becomes a model of the universe space structure and the inner syntagmatics elements within the text becomes the language of space modeling <...>, moreover historical and national language space model becomes the organizing base for building a "world view" [8, p. 212–213].

The contemporary level of cognitive linguistics has the base to research the literary space descriptive parameters; determining the importance of people role in this space to describe the literary images specificity and the space parameters role identification in the literary text.

According to V.G. Gak "in the space literary field, can be identified a number of structures, such as:

1) the measurement space types: point – line – surface – volume;

2) the space architectonics, such as opposition: center / periphery; open / closed space;

3) the position of objects, their spatial correlation, i.e. relative space: near / far; right / left, etc.;

4) direction, orientation; coordinates;

5) measure of the length, distance, surface, volume, etc.;

6) the space perception: appearance, aspect angle, the point (of view), the approach" [3, p. 127]. The space literary field is the part of conceptual sphere.

The present level of cognitive linguistics, having fairly high methodological explanatory

potential confronts researchers new evolutionary challenges, one of which is a modeling of literary conceptual sphere as "whole communicative unit which has components combined into a single hierarchically organized semantic structure of communicative intention by the author" [1, p. 303].

Nominative field of cognitive structures architectonics in the literary conceptual sphere is the result of mentioned space parameters verbalization in the text.

Our researches of literary space based on the fact that "national-cultural identity of the ethnic group of space thinking is manifested not only in a different conceptualization and categorization of the same phenomena of objective reality based on space representations, but in varying degrees of cognitive study of vertical and horizontal oriented subjects" [7, p. 428].

Literary text conceptual sphere is the important component of the national conceptual sphere structured as a unit of literary concepts, including those mental signs and events that preserve the historical memory of the people. These mental signs and are projected into the text as the author's consciousness of cognitivepragmatic significance to the development of the plot and create the text aura.

To identify the specificity of literary text conceptual sphere, first of all, we should research literary space descriptive parameters; secondly, determine the significance of the place and man role in literary space; finally, identify the role of space parameters in the text according to the fact that Russian space world view is characterized by the different interpretation of static and dynamic space localization.

Cognitive-discursive vector of modern linguistic studies, possessing extensive explanatory potential knowledge representation and experience cultural in the linguistic ethnic space due to the perception and interpretation of basic and peripheral components of literary conceptual sphere. It is evidently that, there is the great role of model interpreting as a cognitive process of text meaning identification to determine the cognitive and communicative space parameters.

The interpreting is based, firstly, on some level of knowledge standardization, secondly, on a certain level of mastery on the part of all participants in the communication as members of cultural, ethnic, territorial, social groups.

Consideration of the cognitive-discursive literary space of Russian classics as a fixed version of writers' concepts verbalization as the lingvo-culturology treasury of the Russians allows researching the ethno-cognitive text aura forming under the influence of linguistics and extra-linguistic factors.

Cognitive-hermeneutic analysis of space model in the national segment of literary conceptual sphere of novel "The Brothers Karamazov" by F.M. Dostoyevsky identified some linguistic structures specificity of concept "house". It was identified that concept "house" includes some subconcepts, but we analyze only three of them, such as:

• subconcept "Mrs. Khokhlakova's house",

- subconcept "Karamazov's house",
- asubconcept "father Zosima's cell".

The nominative field researches identified the base semantic components, which is the unity of one-piece and multi-piece nominates.

One-piece nominate is identified as the linguistic structure consisting of a kernel and one or more associated components, describing any one parameter, such as space, time, quality, quantity, etc.

Multi-pieces nominate is identified as the linguistic structure, consisting of a kernel and a few associated words or phrases describing two or more parameters, such as spatial, temporal, qualitative, quantitative, etc.

Cognitive-discursive analysis of the conceptual sphere identified a large number of cognitive space models. First of all, it is interesting to consider the cognitive structures represent the space model of the subconcept "Mrs Khokhlakova's house".

We emphasized the fact that the concept of house is a collective image of housing and living conditions in Russia in comparing with English concept "house" and concept "home".

It is a cultural marked subconcept due to the presence in its nominative field some significant numbers of ethnic marked segments. Concept is represented by a large number of cognitive models that are verbalized by different phrases: *yard hut, house, small house,* and so on.

The word *house* is consumed 313 times in the text in the description of the events, and location of the characters. For example, describing the property of Mrs. Khokhlakova F.M. Dostoevsky used the word *house* five times in two sentences of one context:

Soon he came to Madame Hohlakova <u>house</u>, to the stone <u>house</u>, in fact, two-story, beautiful, the best <u>houses</u> in our town. Although Mrs. Khokhlakova lived mostly in another province, where she had an estate, or in Moscow, where she had her own <u>house</u>, but in this town she had her own <u>house</u>, inherited from their fathers and grandfathers [5, p. 133]. Studies have identified the fact that the subconcept "Mrs Khokhlakova's house" was represented mostly by static cognitive structures, i.e. by the frames.

We researched subconcept "Karamazov's house". This subconcept was represented by concept-element "the building facade" and by concept-element "the interior of building".

We identified the nominative field of two concept-elements "the building facade" and "the interior of building" in the next context:

House of Fyodor Pavlovich Karamazov was not in the city center, but not quite to the edge. He was rather shabby, but had a pleasant facade: one-storey, with an attic, gray painted and a red iron lid. However, he could still stand for a long time, it was roomy and cozy. There were many different closets, different lumber rooms and unexpected ladders [5, p. 68].

Cognitive-hermeneutic analysis of the material shows that in the study space text segment, in particular, there is the opposition: center \leftrightarrow periphery: proxeme *the house was not in the city center* \leftrightarrow proxeme *but not quite on the outskirts*. This is localization in space text structure. In the house description there were identified linguistic markers of vertically horizontal space vectors. Thus, the vertical vector was verbalized by proxemes which are represented by phrases:

1) (house) with an attic;

2) unexpected ladders.

The *horizontal space vector* was verbalized by the phrases:

1) was roomy;

2) there are many different closets;

3) *different* lumber rooms.

The second research step of nominative field in the subconcept "Karamazov's house" is the study of concept-element "the interior of building" which is verbalized in the following context:

He really found his father still at table. The table was also on the continual custom, served in the sitting-room, although there was in the house and a real dining-room. This sittingroom was the largest room in the house, with a sort of vintage claim furnished. The furniture was ancient, white, with a red grosgrain dilapidated upholstery.

In the spaces between the windows were inserted in the mirror elaborate antique carving frames, also white and gold. On the walls, covered with white paper and in many places already cracked wallpaper and adorned with two large portraits – one of the Prince, thirty years ago, the former governor-general of the local region, and some bishop, also long since dead. In the front corner was placed a few icons, before which at night lit the lamp ... not so much awe as to a room for the night was lit [5, p. 91].

Cognitive-hermeneutic analysis of the text identified, first of all, predominance of space localization markers:

1) (father) at table;

2) table served in the sitting-room;

3) in the spaces between (the windows);

4) on the walls;

5) in the front corner.

Secondly, the horizontal space vector nominate which was verbalized by phrase *between the windows* and the vertical space vector nominate which was verbalized by the word *icons*, which are located in the house, as a rule, a little higher than a man. Thirdly, the ethno-verbalizater of space localization – *in the front corner*, i.e. in the red corner (icon coner). Finally, the word *lamp (before the icon)*.

Than, it was researched the subconcept "*father Zosima's cell*" in the next context:

The whole cell was very narrow and some kind of sluggish. Things were rough and furniture, the poor and the most necessary only. Two pots of flowers on the window, and in the corner a lot of icons – one of them the Virgin, the huge size and write, painted perhaps even before the split. Before it there is the kindled lamp. Near there are two other icons in shining garments, then about them hand-made cherubs, porcelain eggs, a Catholic cross of ivory with hugs him Mater dolorosa and several foreign engravings from the great Italian artists of past centuries.

Beside these elegant and expensive engraving images splashed a few sheets of the most vulgar Russian lithographs of saints, martyrs, saints and so on. Sold for a penny at all fairs. There were several lithographic portraits of Russian contemporary and former bishops, but on the other walls [5, p. 28].

The cognitive-hermeneutic context analysis identified that nominative field of subconcept includes 13 nominates, which represent the large space of Elder Zosima's cell and objects that are in this space. These nominates have different structures.

1) Two-pieces nominate proxeme *cell was* very narrow and some kind of sluggish consists of the kernel, i.e. the word *cell*. The component *(cell) was very narrow* represents the space category and the second represents component some kind of sluggish.

2) Three-pieces nominate-proxeme *things* were rough and furniture, the poor and the most

necessary only consists of the kernel which is represented by the word *things*. The phrase

a) *the words rough* and *poor* represents a value parameter;

b) the phrase *the most necessary only* verbalizes the demand option.

3) One-piece nominate was represented by the proxeme *two pots of flowers*.

4) One-piece nominate was represented by the phrase *a lot of icons*. The word *icons* is cultureme.

5) Three-pieces nominate-proxemes *one of them* (*icons*) *of the Virgin, the huge size and write, painted perhaps even before the split* consists of the kernel which is represented by the phrase *one of them the Virgin*.

The phrase *huge size* verbalizes the size parameter. The word *write* represents the coulor. The phrase *even before the split* verbalizes the time parameter.

6) One-piece nominate was represented by the phrase *heat lamps*, the kernel is the word *lamps*.

7) Two-pieces nominate was represented by the phrase *two other icons in shining garments*. The kernel is the word *icons*. The word *two* verbalized the number, while the phrase *in shining garments* verbalizes the quality. The word *garments* is cultureme.

8) One-piece nominate is the phrase *hand-made cherubs*. The kernel is the word *cherubs*.

9) One-piece nominate *porcelain eggs*. The kernel is the word *eggs*.

10) Three-pieces nominate a Catholic cross of ivory with hugs him Mater dolorosa. The kernel is the word cross. The word ivory verbalizes quality. The phrase with hugs him Mater dolorosa verbalizes setting compositions. The word catholic verbalizes the religious specificity.

11) Five-pieces nominate several foreign engravings from the great Italian artists of past centuries \leftrightarrow elegant and expensive engraving images. The double-kernel is engraving \leftrightarrow engraving images. The word several verbalizes the number.

The word *foreign* verbalizes the setting place of manufacture. The phrase *from the great Italian artists of past centuries* represents the source. The word *elegant* verbalizes quality. The word *expensive* verbalizes the value parameter.

12) Five-pieces nominate splashed a few sheets of the most vulgar Russian lithographs of saints, martyrs, saints and so on. Sold for a penny at all fairs. The kernel is the phrase lithographs of saints, martyrs, saints and so on. The word splashed verbalizes a quality. Philological sciences

The word *a few* verbalizes quantity. The phrase *the most vulgar* verbalizes the authorship. The word *Russian* verbalizes ethno-parameter. The phrase; *sold for a penny at all the fairs* verbalizes the cost parameter.

13) Four-pieces nominate several lithographic portraits of Russian contemporary and former bishops, but on the other walls. The kernel is the word portraits. The word several verbalizes the number of the parameter. The word lithographic verbalizes quality parameter. The word Russian is ethno-parameter. The phrase current and former (bishops) is chroneme, because verbalizes a parameter of time.

All of these 13 nominates enlarge the cell space into horizontal and vertical vectors. Some nominate are point space markers.

To sum up, the research of the space segment in the literary conceptual sphere is the basic way to identify the specificity of space structural architectonics of the text. Space structural architectonics as the unit of proxemes is the complex construct.

The parameters of space contextual models represent the horizontal and the vertical oriented objects in the literary space of the novel "The Brothers Karamazov" by F.M. Dostoyevsky.

The researches of three subconcepts, such as subconcept "Mrs. Khokhlakova's house", subconcept "Karamazov's house", and subconcept "father Zosima's cell" identified the specificity of this space segment in the nominative field of the concept "house". The researches of three subconcepts' nominative field identified the base semantic components, which is the unity of one-piece and multi-piece nominates.

It is evidently, that culturally marked proxemes have so great role in the space models' structures of three researched subconcepts into the identification of literary characters specificity.

References

1. Alefirenko N.F. Discussible semantics issues. – M.: Gnozis, 2005. – 326 p. $\,$

2. Alefirenko N.F. Language, understanding, and culture: Cognitive-Semiological synergy of the word. – Volgograd: Peremena, 2006. – 228 p.

3. Gak V.G. Space out of space // Logical analysis of language. Space languages. – M.: Russian culture languages, 2000. - P. 127-134.

4. Galperin I.R. Text as the linguistics research object. - M.: Komkniga, 2006.

5. Dostoevsky F.M. The brothers Karamazov. – M.: Fiction, 1989. – 572 p.

6. Kharchenko V.K. The writer Sergey Esin: language and style. – M.: Contemporary writer, 1998. – 240 p.

7. Korneva V.V. National-cultural specificity of space consciousness and translation // Social issues of translation. – Vol. 8. – Voroneg: VSU, 2008. – P. 422–431.

8. Lotman Yu.M. Structure of literary text // About art. – SPb.: Art SPb, 1998. – P. 14–285.

9. Maslova V.L. Linguo-culturology. – M.: Academy, 2001. – 208 p.

10. Ogneva E.A. Synergy in the fiction model // Contemporary issues of science and education. $-2014. - N_{\odot} 4$; URL: http:// www.science-education.ru/118-13955 (date: 17.07.2014).

11. Panasenko N. Global text categories in poetic images of the world (based on Ukrainian, Mongolian, and Vietnamese). In Zdobutki ta perspektivi rozvitku suchasnogo movoznavstva: Mizhnar. zb. nauk, pr., prisvjach. 70-rich. juvil. prof. Alli Andriïvni Kaliti. – К.: Вид-во Політехніка, 2015. – Р. 99–108.

12. Petrenko V.F. Psychosemantics bases. – Smolensk: SSU, 1997. – 400 p.

DIAGNOSTIC METHODS FOR DETECTION OF MANIFESTATIONS DEVIANCE-VICTIM BEHAVIOR OF TEENAGERS

Karmanova Zh.A., Mazhenova R.B., Kadina Zh.Z., Manashova G.N.

RSE «Karaganda State University named after E.A. Buketov» of the Ministry of Education and Science of Kazakhstan, Karaganda, e-mail: karmanovazh@mail.ru

The article is devoted to the use of complex methods of detecting the level of manifestation deviance-victimization of student conduct. To diagnose the level of deviant behaviour and victimization in adolescents were used different methodologies. At each stage, depending on the tasks carried out a systematic observation of adolescents in the educational process, allowing to identify the presence of knowledge, abilities to solve tasks, trends in behavior.

Keywords: deviant behavior, victim behavior, students, diagnostics, education, teenager

In recent years a number of reasons, including because of the instability of society and the intense social change, increased negative trends, increased demands for self-determination and personal stability and provoking her deviant and victim behavior, and often degradation and self-destruction. The importance of the problem of deviant and victim behavior of teenagers due to the worsening tendency to increase the number of designated contingent of pupils with behavioral problems and becoming victims of crime. Therefore, the issue of prevention of deviant-victim behavior of teenagers – one of the main directions of work of educational institutions.

The purpose of our study is to analyze the diagnostic methods to identify manifestations of deviant-victim behavior of adolescents.

Materials and methods of research

As methods of research was the study of regulatory, scientific, psychological and pedagogical, methodological literature; analysis and generalization of the advanced pedagogical experience; observation, interview, questionnaire, testing, pedagogical experiment, methods of quantitative and qualitative processing of the material.

Results of research and their discussion

By the selection of the complex methods that detect the level of manifestation of deviant-victim behavior of students, we proceeded from the system-activity approach, which involves the examination of processes and phenomena in the system and the relationship, but a manifestation of a quality business.

To diagnose the level of manifestation of deviant behavior among adolescents following methods were used: patoharakterologicheskie diagnostic questionnaire A.E. Licko [1]; Questionnaire propensity for deviant behavior (scale Y.V. Popov – N. Ivanova) [2], the level of aggressiveness of diagnostic technique Bass-Darky [3]. In the diagnosis of the level of manifestation of victim – methodology: research methodology propensity for victim behavior designed O.O. Andronikova [4], a technique of "unfinished thesis" [5], a technique of "Locus of Control" [6], the method of determining the level of formation evaluation skills and safe behavior in various situations.

Patoharakterologicheskie diagnostic questionnaire A.E. Licko. The questionnaire is designed to determine in adolescence (14–18 years) with type nature psychopathy, psychopathic developments, as well as the accentuation of character, it is an extreme variant of the norm. The questionnaire consists of phrases containing 25 themes. Among the topics included evaluation of its own vital functions, related to the family and others, and some abstract categories. The kit includes the phrase, reflecting the ratio of different types of character to a number of problems in life, and indifferent phrases. The subject is offered the freedom to choose one or more (up to three) answers to each topic or failure. The proposed questionnaire alphabetic code symbols correspond to the scores in favor of the following types: T - hyperthymic, D - cycloidal, L - labile, A – asthenoneurotic, On – the sensitive, P – psychasthenic, W – schizoid, e-epileptoid, I – hysteroid H – unstable, K – nonformny. To calculate the points in favor of each type you need to draw a graph. After this type of diagnosis of psychopathy and accentuation of character by using certain rules. It is the personal questionnaire.

Questionnaire propensity for deviant behavior (scale Y.V. Popov – N. Ivanova). The questionnaire is designed for teenagers aged 13 to 18 years. Testing is carried out individually or with a group.

The main objective of the SOP – identifying tendency of adolescents to certain deviations in behavior. Identification of risk social exclusion (scale Y.V. Popov – N. Ivanova) is possible if using the PDO defined gipertivny, labile, the sensitive, schizoid, epileptoid, istoreidny, unstable types of character accentuations. If diagnosed mixed type, that are oriented to the type for which scored the highest number of points. If the diagnosis of mixed type in relation to each of the selected types of the same number of points, then use a scale of one where revealed signs of maladjustment. The presence of at least one of the signs says the risk of maladjustment, the presence of two or more features making this a high risk.

In accordance with these rules is diagnosed type of character accentuation. Methods of diagnosing the propensity to deviant behavior contains the scale:

1. The scale of the installation on the socio – desirable answers. High scores indicate that adolescents do not meet socially desirable plants. Low indicator that a person seeks social attitudes.

2. Scale propensity to overcome rules and regulations. High scores on this scale indicate a high level of orientation of the person to go counter to social norms. Low indicates that the individual is able to comply with the rules and regulations.

3. Scale propensity to additive behavior. High scores indicate that there is a predisposition to drug use. Low contrast, indicates that the risk of substance use is negligible.

4. Scale tendency to self-harm and selfdestructive behavior. High scores indicate that the subject is inclined to risk and causing yourself harm. Low levels indicate that the teenager does not feel the desire for self-destructive and self-injurious behavior.

5. Dial the propensity to aggression and violence. High scores indicate that adolescents are inclined to aggression and violence towards others. The low rate suggests that this tendency is not expressed.

6. Scale of voluntary control of emotional reactions. A high indicates that the teenager is not able to control emotional reactions, the low level of voluntary control. The low rate indicates that the teenager is able to manage your emotional reactions, strike volitional control.

7. Scale propensity to delinquency behavior. A high indicates that the person is able to commit unlawful conduct. Low rate and says the least probability of manifestation of this behavior.

8. Scale of acceptance of women's social role. This scale is used only for females. High scores indicate that women's social roles are not accepted. Low rates suggest that women's social role adopted. Some items of the questionnaire are included simultaneously in several scales.

The study proposes the subjects read statements and decide whether these statements are true in relation to them. If true, then the answers on the form next to the number corresponding to the statement on the small box labeled "Yes" to put a cross or a tick. If they are incorrect, then place a cross or tick the box under the designation "No". The results of male and female variants are processed using different keys, but the scoring procedure is the same. Each account, in accordance with certain embodiments, the key is assigned one point. Then, for each scale total score is calculated. This total score is compared to the estimated results on the scales, which are summarized in the table below. Scorecard makes it possible to determine the tendency of teenagers to a particular deviation.

Methods for diagnostics of level of aggressiveness Bass-Darky. To identify the level of aggressiveness use questionnaire Bass-Darky.

By creating your questionnaire, differentiating aggression and hostility, A. and A. Bass Darky identified the following types of reactions:

1. Physical aggression – the use of physical force against another person.

2. Indirect aggression – aggression, in a roundabout way directed at another person, or anyone not directed.

3. Irritation – willingness to manifest negative feelings at the slightest excitation (temper, rudeness).

4. Negativism – opposition demeanor of passive resistance to active struggle against the established customs and laws.

5. Offense – envy and hatred of others for real and imaginary action.

6. Suspicion – ranging from distrust and caution in relation to the people to the belief that other people are planning and are harmful.

7. Verbal aggression – an expression of negative feelings like through the form (scream, yelp), and through the content of the verbal responses (curses, threats).

8. Feelings of guilt – a possible conviction of the subject that he is a bad person, that goes wrong, and they perceived remorse.

In compiling the questionnaire the authors used the following principles:

- The question may refer to only one form of aggression;

- Questions are formulated in such a way as to maximize the effect of weakening public approval to answer the question.

The questionnaire consists of 75 statements that are subject answers "yes" or "no". The survey reveals the following forms of aggressive and hostile reactions:

- 1. Physical aggression (attack).
- 2. Indirect aggression.
- 3. Tendency to irritation (irritation).
- 4. Negativism.
- 5. Resentment.
- 6. Suspicion.
- 7. Verbal aggression.

In addition, it stands eighth – remorse, guilt. Answers to questions of this scale express a moderating influence on the manifestation of guilt forms of behavior that are normally forbidden norms of society. This paragraph expresses the degree of belief of the subject that he is a poor man who does wrong things, the presence of his remorse.

Processing questionnaire Bass-Darky is done by indexing the various forms of aggressive and hostile reactions.

Research Methodology propensity for victim behavior designed O.O. Andronikova. Research Methodology victim behavior is a standardized test, questionnaire designed to measure the susceptibility of adolescents to the implementation of various forms of victim behavior. The object of the application methods are social and personal settings. Test questionnaire is a set of specialized psycho scales designed to measure the predisposition to the implementation of certain forms of victim behavior. Designed for inspection of teenage and youthful age. The questionnaire can be used as a self-diagnostics instruments, and in combination with other techniques aimed at the study of the adolescent's personality.

"Unfinished thesis" Methodology. Students are invited to a few minutes to complete the phrase. As a result of this technique can assess knowledge, skills victim behavior of adolescents.

Methodology "locus of control". The technique allows to determine what holds people responsible for the events in their lives. People tend to see the source control their lives or predominantly in the environment or in itself.

Externalities are held responsible for everything that happens to them in life, other people or external circumstances. In their view, the failure depend on the bad luck, coincidence or influence other people. Internals feel responsible for everything that happens to them. In their understanding only the level of their own competence, ability, commitment, character and the like affect the success or failure. They are inclined to a greater extent than externalities, analyze their actions and are more tolerant and independence.

Quiz – questionnaire localization of subjective control (SLC) S.R. Panteleyev and V.V. Stolin is designed to measure the locus of control in adolescents.

The questionnaire contains 32 points (26 employees and 6 camouflage), built on the principle of forced choice of one of the two statements, and forms a one-dimensional scale, which gives the composite index locus of control.

Methods of assessing the determination of the level of formation of skills and safe behavior in various situations. The purpose of this methodology is to analyze the knowledge and skills out of dangerous situations existing in adolescents.

At each stage, depending on the tasks carried out systematic monitoring of adolescents in the educational process, which revealed the presence of knowledge and skills to solve tasks, trends in behavior. An important place was given to the group and individual interviews, questionnaires, self-awareness actions and deeds, the method of self-esteem.

Conclusion

Selecting complex diagnostic method based on components deviantno-victim behavior of adolescents, namely, motivation and personal, meaningful, behavioral and reflective. The aggregate results of component wise defined levels of deviant manifestations-victim behavior of adolescents.

References

1. Licko A.E. Pataharakterologichesky diagnostic questionnaire for adolescents and experience of its practical use. – M.: NIIPP them. Behterova, 2006. - 96 p.

2. Questionnaire propensity for deviant behavior (scale Y.V. Popov – N. Ivanova). – http://psihu.net/library/file1046.

3. Methods of diagnosing the level of aggressiveness of Bass-Darky. – http://azps.ru/tests/tests_agression.html.

4. Research Methodology propensity for victim behavior designed O.O. Andronikova. – http://self-injury.at.ua/index/0-12.

5. The method of "unfinished thesis". – http://philologist. z83.ru/linktests/242-l-r.

6. The method of "Locus of control". – http://psyline.retter. ru/lokus/start.php. Tukhanova V.Yu., Tikhonova T.P.

Moscow State University of Technology and Management K.G. Razumovsky (PKU), Moscow, e-mail: vumlll@mail.ru

The article considers the engineering packaging materials for garments, a method for assessing the sustainability of the construction site pocket and suggests ways of improving the quality of products.

Keywords: packaging engineering, estimation techniques of properties of materials, breaking load, strength of the structure of the unit, technology

When choosing the materials in the package of the product there are problems of meeting customer requirements with high quality competitive clothing. The rapid development of textile materials with new consumer properties, as well as the fierce competition of products in the garment factories are forcing manufacturers to search for new design solutions range, but also use the replacement materials for the visual diversity of products.

Expansion of the range and its visual diversity provides the enterprise with a high level of product sales and consumers – with a feeling of satisfaction of their social needs. Expansion of the range and its visual diversity provides the enterprise with a high level of product sales and consumers – with a feeling of satisfaction of their social needs.

There are more than 20 consumer properties of materials such as shrinkage after treatment and washing, color fastness of materials, threads spread in the fabric and seams, pilling, elasticity, crease-resistance, cutting of needle, drapability, tensile strength, extensibility, hygroscopicity, breathability, water resistance, color stability of materials, resistance to abrasion, ablator characteristics and others.

Various authors and research teams have developed methods to assess different properties. Most of the methods require special expensive equipment, which enterprises producing garments do not have.

Sewing enterprises, within existing funds, can test materials on the defects of fabric using visual characteristics; measure the shrinkage after the wet-heat treatment and duplication; check threads spread in the seams and material cutting with the help of pre-sew seams and stitches, organoleptically assess the bonding capacity of the main fabric with fusible interlining material – its adhesion.

It is obvious that these indicators are not enough to manufacture the product meeting all requirements of consumers. While selecting the package to ensure high product quality it is necessary to consider the properties of all materials, making it. Clothes, basically, are a multilayer system consisting of: main material, lining, fusible interlining materials, insulation, thread, glue and accessories. The properties of each component of the package are important for the production of high quality products. Tests of one parameter are not sufficient to determine the compliance of a package of materials to the specified requirements to the product, a set of properties that are included in its package are more significant.

Evaluation methods of properties of materials are aimed at studying the properties of the tested material. The specificity of the production of garments requires knowledge about the interaction of package materials in various units of the design, especially in products used in extreme conditions. Unit of garments is a complex system, testing of which is much more complicated than testing of individual materials.

Unit design in this work is considered as its structure, consisting of parts: materials included in its package, and methods of joining parts. The strength of the garment largely depends on its cut and shape, properties of materials included in the package, quality of workmanship and operating conditions.

It was found out that one of the affected units in clothing for various purposes, is the design functional and decorative unit "pocket". Characteristics of a construction site "pocket" are laid on stages: confectioning of materials, when choosing a method of processing a pocket, and the choice of regimes of the wet-heat treatment and pressing. The stability of the structure unit "pocket"

The stability of the structure unit "pocket" is provided by a set of operations: the packaging of each component of the package plays a role in the future operation. The packaging materials of the construction site "pocket" with desired resistance properties has a high operational value.

In the enterprise, replacing one material for another, the confectioner primarily focuses on information about the fibrous structure of the material presented in the passport of the piece. Fabrics of one destination having the same fibrous structure have different consumer characteristics, so manufacturing garments entails problems of confectioning materials for the same range.

To identify the set of properties affecting the stability of the structure unit «pocket» 13 articles

of fabric used for making jackets, coats and suits were selected. The materials having the same fiber composition were chosen in each group. It was done in order to experimentally establish the degree of influence of the surface density and thickness on consumer properties of clothing. The investigated materials are presented in Table.

Tissue samples						
Group	Sample	The fiber com- position	Product group	Surface density g/m ²	Thickness, mm, under a pressure of 0,2 kPa	Appearance
1	2	3	4	5	6	7
№ 1	1	100 % polyester	Jackets fabric	82,3	0,12	
	2	100 % polyester		199,1	0,32	
	3	100 % polyester		57,1	0,09	
<u>№</u> 2	4	70% wool; 30% polyamide	Coat fabrics	428,1	2,32	

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

56

Continuation of Table

1	2	3	4	5	6	7
№ 2	7	70 % wool; 30 % polyamide	Coat fabrics	399,5	2,12	
№ 3	5	65% polyester; 31% viscose; 4% elastane	Suit fabrics	410,0	1,2	No.
	6	65% polyester; 31% viscose; 4% elastane		372,9	0,98	
№ 4	8	43 % wool; 53 % polyester; 4 % lycra	Suit fabrics	241,4	0,72	
	13	43 % wool; 53 % polyester; 4% lycra		191,9	0,38	

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

Termination of Table

1	2	3	4	5	6	7
№ 5	9	62% polyester; 34% viscose; 4% elastane	Suit fabrics	375,5	1,18	
	10	62% polyester; 34% viscose; 4% elastane		236,2	0,56	
№ 6	11	73 % polyester; 22 % viscose; 5 % elastane	Suit fabrics	217,4	0,44	
	12	73 % polyester; 22 % viscose; 5 % elastane		302,1	0,56	

For the first phase of testing materials the samples of units patch pockets lined without the use of interlining materials for the main fabric (single layer clothing) were manufactured. The aim of this phase was to identify problem areas of the site during the operation. The task was to study its mechanical properties at break. That is why the methodology of site garments research, based on the the vectors of load application on a unit was developed (Figure). The pocket was divided into 3 zones: the seam at the bottom of the pocket; the seam in the side part of the pocket; and the seam in the corner part at the top of the pocket. The method of load application was used along the lines of the base fabric (the seam at the bottom of the pocket); along the line of the weft of the fabric (the seam in the side of the pocket, the seam in the corner part at the top of the pocket);under 45°(the seam in the corner part at the top of the

pocket). To study the mechanical properties of the units, the samples were spread in a uniaxial direction with the use of semicycle characteristics. The samples of pockets were subjected to a relatively rapid stretching, bringing them to destruction.



Vector load is applied to the unit "pocket"

Analysis of the values of the breaking load of joints of materials of the same fiber composition in one product group at different surface density has shown that there is no regularity in the results of the strength characteristics.

Based on the results of testing groups of samples of the unit «pocket», it is concluded that not only the thickness and surface density of materials included in the package unit, influence the explosive characteristics of the materials, but weaving, impregnation, and fabric treatment.

After the first experiment there appeared a question about the universality of recommendations to ensure the stability of construction nodes of apparel products at the stage of confectioning materials in the package of the product. The stability of the structure depends not only on material characteristics included in it, but also depends on technological processing methods. In the second experiment, observing the same technical terms, two methods of strengthening the construction site were applied: technological horizontal tack perpendicular to the seam felling pocket) and confectioning (different types of fusible interlining materials). Using the vector method of load application it was possible to determine that the effect on unit strength has a combination of factors: physical and mechanical properties of the core material and thread, cloth piercing with a needle (needle diameter), cutting the interlining strips, the wet-heat treatment regime and duplication.

On the basis of experimental data the method of assessing the sustainability of the construction site pocket to external influences was developed and the factors influencing the process of confectioning the package of materials for the construction site "pocket" were defined.

Obtained data can be used to predict the stability of the structure during operation, but it is only one of the indicators of quality. To conduct a comprehensive evaluation of the various units of garments material resources and special equipment is required that is fabric-consuming.

To improve the quality of products we can test garment units and packages of materials on the basis of independent specialized laboratory source of funds. Constant updating of assortment of garments and the appearance of new types of textile materials require the development of scientifically – based methodology of engineering confectioning of materials.

The use of new textile materials is impossible without scientific methods of confectioning without examining their impact on human activity, theoretical investigations of the process of confectioning with new forms of garment production in terms of outsourcing.

References

1. Zinkovskaya E.V. Development of design technology of structures of pack clothes with elastic elements: thesis of candidate of technical Sciences; 05.19.04. – M., 2003. – 186 p.

2. Zinkovskaya E.V., Tikhonova T.P. Mechanical properties of applied materials with glue coating, produced by JSC "Iskozh" // Garment industry. -2002. -N 3. -P. 40–42.

3. Stelmashenko V.I., Rozarenova T.V. Materials for clothing and packaging. – M.: Academy, 2010. – 320 p.

4. Tukhanova V.U., Tikhonova T.P. Determination of the factors influencing the process of confectioning materials // Modern high technologies. Regional app. – 2015. – $N_{\rm D}$ 4. – P. 204–209.

THE HYBRID, COAXIAL, WATERPROOF STEEL CABLE WITH FIBER OPTIC AS THE 1KHZ-100 KHZ FREQUENCY SINGLE-CONDUCTOR FOR HIGH VOLTAGE AND HIGH FREQUENCY POWER SUPPLY TRANSMISSION SYSTEM FOR REMOTE CONSUMERS OF AGRICULTURAL PURPOSE

¹Yuferev L.Y., ¹Roshin O.A., ²Gavrilov L.G., ³Esaulov V.A.

¹All-Russian it is scientific – research institute of electrification of agriculture, Moscow, e-mail: lab767@gmail.com;

²Federal State Unitary Enterprise Developmental Bureau of the Oceanologic Equipment of the Russian Academy of Sciences, Moscow;

³Southern Russian state polytechnical university of M. I. Platov, Novocherkassk, e-mail: esaul_va@mail.ru

On the basis of new materials can be made electrically conductive wire having a small weight, high chemical resistance, strength and electrical conductivity, and comprising fiber in their construction. The use of such cables can transmit power for the terminal equipment and sensors using the resonant power transmission system to underwater electrical load at a distance of up to 1 kilometer of the steel wire, in the water and at the same time be safe for human and eviroment. Being at the same time, the water safe for humans, aquatic organisms and the environment in the event of breakage, damage or fault s. This article describes a new generation of power transmission network using a hybrid, submarine coaxial cable with fiber-optic cable that is specifically designed for underwater works, fisheries, rural consumers and a wide range of applications where moisture resistant and safe system is necessary. All advantages described in detail.

Keywords: power transmission by single conductor steel wire, resonance system transmitter, cable unit, foot block line, overhead line, single-conductor, rural consumers, hybrid cables, transmission of electric, transferring block, the reception block, the cable line, overhead line, single-wire line, high voltage ac cables, long, High, Voltage, high, frequency, coaxial, Hybrid, HVDC, Wind Farms, Commutation Failure, rectifier, inverter, nanowire, lightweight, wire with fiber, the resonant power transmission system

For the revival of agriculture in Russia it is necessary to create a fundamentally new energy base infrastructure by using distribution of next generation networks, local and renewable sources of electrical energy. Distribution of the new generation network is proposed to establish at base of Energy Saving single-conductor resonant systems for rural electricity consumers under Nikola Tesla ideas.

Progress in material technology in widebandgap semiconductors, such as Silicon Carbide (SiC) enables increasing the operation frequency of high-voltage (HV) generators and using less series connected devices for the same voltage rating of the HV-generators. These generators are frequently equipped with HV multipliers, such as the Cockcroft-Walton cascade, a resonant inverter and a high voltage transformer. Power conversion at high frequency usually helps reducing the system size and cost and allows better efficiency at smaller size and lower weight. At high frequency and high voltage, however, the influence of parasitic effects of the multiplier, namely parasitic capacitance, becomes highly relevant to the feeding circuit. Experience from existing circuits indicates, that the total parasitic capacitance at secondary side is not only related to the HV transformer and the junction capacitance of the diodes, but also to the extension of the electric AC field in the rectifier circuit, which

reflects the structural parasitic capacitance. It can happen that a substantial amount of driving current is required only for inverting the voltage across the parasitic capacitance, which puts a limit on the maximum useful frequency. In general it is to be expected that parasitic capacitance will increase with denser packaging of the components.

Modelling techniques of high voltage AC cables has been a subject to researchers as early as in the 1920'ies and research in the field continues steadily as cables become more complicated in design and more popular at higher voltage&frequency levels and for longer transmission lengths. In recent years, the interest towards using underground cables in power transmission has increased considerably. In Denmark, the entire 150 kV and 132 kV transmission network shall be undergrounded during the next 20 years. Even 400 kV transmission lines will be undergrounded gradually as more experience is gathered. Precise modelling of long and many (meshed) underground cable lines is therefore essential and it is important that differences between simulations and measurements are identified, studied and eliminated. A study of the cable model accuracy for transmission line modelling is the topic of the research documented in this thesis.

The resonant power supply system allows you to transfer electrical energy at any frequency, that will be the most optimal for the particular electricity transmission scheme. Traditional power system operates at a frequency of 50 Hz, which is controlled by automated system, and it leading to fluctuations in the system frequency power, and sometimes to full blackout. Like in the USA in 1962 year.

In 1950–1960 of the last century, Russian scientists have developed power systems with DC-inserts. They were built in Vyborg, Finnish Paste, Volgograd – Donbass 800 kV, projected insertion DC voltage 1500 kV Ekibastuz. Resonance High Frequency single-conductor transmission system has in its structure two DC link reduced by weight and size dimensions as electrical equipment and can transmit electricity at single-conductor lines with minimal losses. A big problem in the regional grid companies (DGC) is a power quality, because power generators are far away from the Consumer.

When comparing equivalent electric AC and DC transmission systems is that when certain (critical) length of the line of their total cost (plus a substation line) are compared, and when the length of the line is greater than the critical power lines PT becomes more economical. At present, the critical length of the air line is 600– 800 km, and cable lines -30-50 km. However, even if the length of the line is equal to zero, the so-called DC link – VPT (rectifier and inverter substations installed in one building) - can solve problems that, in principle, can not be solved using the AC power lines, for example, to connect the two AC systems operating asynchronously or even having different frequencies (the system 50 and 60 Hz, such as in Japan).

As an example, the Danish network is connected to the neighbouring networks through several HVdc and HVAC interconnections. These HVdc systems terminate close to each other and when all are importing power into Denmark, having multiple commutation failures for a single ac fault is expected. Under certain generation scenarios, the western part of Denmark is operating in what is called a "wheeling mode", where some of the HVdc terminals in Denmark are operating as rectifiers while others operate as inverters. This situation can happen for example when power is exported to Sweden and imported from Norway at the same time. In this operation mode it has been observed that a commutation failure at the inverter side of the first HVdc link will propagate through its rectifier to the AC system at its sending end and eventually causes a commutation failure on the second HVdc link. Since the commutation process is a short term transient event, electromagnetic transient simulation is required in order to observe the commutation failure propagation phenomenon.

Materials and methods of research

It has been widely accepted that voltage source converter (VSC) based HVDC system using IGBT is the preferred DC technology for connecting wind farms due to its advantages of independent active and reactive power control, flexible AC system control and support which are particularly important for offshore wind farms. A number of VSC connected offshore wind farms have already been in operation, This work was supported in part by China Electric Power Research Institute and the State Key Laboratory of Alternate Electrical Power System with Renewable Energy. VSC based multi-terminal HVDC systems have also been developed, e.g. the three-terminal ± 160 kV Nanao project with the converters rated at 200, 100 and 50 MW, respectively. On the other hand, the conventional line commutated converter (LCC) based HVDC systems using thyristor have long been used for bulky power transmission and proven to be superior to VSC systems for high power rating in terms of cost and reliability. A number of recently commissioned LCC-HVDC projects have DC voltages of up to ±800 kV and power capacity of a few GW, e.g. the 5 GW Yunnan-Guangdong HVDC link and the 8 GW Xiluodu-Zhejiang HVDC link. However, LCC systems usually require relatively strong AC systems to operate, and thus become problematic when supplying island networks, e.g. offshore wind farms. In addition, they require larger footprint than VSCs and thus are more difficult for offshore installation. Hybrid, waterproof coaxial cables are more cost-effective solution for such coastal consumers.

China Yunnan-Guangdong transmission system control and modulation scheme of DC system greatly effect on transient stability in AC/DC hybrid power grid. Taking Southern China Power Grid in the year of 2015 for example, when fault occurs in the sending system Yunnan power grid, influence of modulation scheme such as large power flow modulation and bilateral frequency modulation on transient stability margin of hybrid system is explored. Study results are available for reference in the programming and the making of DC modulation measures for ultrahigh voltage Yunnan-Guangdong transmission system.

Results of research and their discussion

The new sample of the hybrid cable reduce technical losses in networks of DGC transmission of electricity at the lowest cost, reduce theft cases of electricity, electrical, ferrous materials, as well as to realize networking sites RAC (it has fiber optic lines) carried out the country's energy policy by energy conservation. The resonant high-frequency electric power industry has a huge promising future, the more so that the power electronic components is constantly improved, it creating new materials that can withstand increasing tension and frequency. These system also need to be used with non metal cables that consist fiber optic lines. It has so many advantages to the final Consumers like communication, light weight of cable, resistance of a line, etc.





Fig. 1. Western Denmark network as planned for 2030 (including for agricultural consumers, source: Energinet.dk)

In the first stage of tests was tested with a copper conductor cable and cable results "BOGEKS-2" 100m length following test results were obtained (Table 1).

The next development was the cable "BOGEKS-3" in length 294m, and the following results were obtained (Table 2).



Fig. 2. Yunnan-Guangdong transmission system



Fig. 3. The dependence of the resistance of the cable "BOGEKS-3" wire braid and frequency

Table 1

BOGEKS-2" results

Capacity	12 nf screen
Capacitance between conductors	7 nf
Capacitance per unit length	70 pF/m
The resistance of a conductor	56 ohm
The resistance of the two cores	112 ohm
The resistance per unit length	1,12 ohm/m
Screen Resistance	125 ohm

Table 2

"BOGEKS-3" results

Capacity lived	53,7 nf screen
Capacitance per unit length	182 pf/m
Conductor resistance	48,5 ohm
Screen Resistance	11,1 ohm
The resistance per unit length overall	0,2 ohm/m
The resistance per unit length	0,57 ohm/m
Screen Resistance	114 ohm



Fig. 4. Proposed scheme for Energy Saving single-conductor resonant power supply system via new cable infrastructure "BOGEKS-3"

It allows energy customer to create electrical equipment of new generation with small dimensions and weight sizes, meeting the modern requirements for quality electricity, electromagnetic compatibility, as well as the efficiency of electrical equipment. Thus, using (HVHF) single-conductor resonant systems will be solved by one of the electrification of the major problems, particularly in agriculture – the creation of a reliable electrical power for small villages, hamlets and farms and distant objects in the vicinity of water. The system is absolutely safe, in case of interruption, fault and short circuit. Will change the system capacity and people, aquatic life and the environment will not be affected, as it can occur when conventional systems.

Using of hybrid cables at such systems is obligatory as communication is a modern society. Hybrid cable could be connected to variety of sensors as well. On this basis, it is proposed to use widely Energy Saving single-conductor system using resonant mode at high frequency power supply for rural consumers.

The system is able to create a much more perfect technological approach for energy transfer with structural scheme shown in Fig. 5.

The single wire power transmission system allows to create a variety of different technology options for Energy Saving Systems, as well as to solve engineering tasks of a quality power supply to an infinite number of variants electrical consumers. Justification of the block diagram of a resonant transmission system



electric energy will start with creating a unifying and common for all on functional task of transmitting resonant system unit (PBRS). PBRS consist a rectifier with a filter that converts AC 50 Hz main voltage into a DC voltage, receiving power from a standard singlephase or three-phase electric network, or any other. Like renewable power source DC or AC. Renewable systems as modern equipment need to be used with a feedback and telemetry control line. These needs will be served by hybrid fiberoptic cable.

PBRS using the oscillating circuit, which includes a resonant Tesla transformer and capacitor unit connected through single-conductor hybrid coaxial fiber cable or air line and feeds all kinds technological electrical systems. PBRS has the ability to monitor the voltage in the resonant circuit in the line and also load, and control the operation of electronic switches with calculating the voltage across the load at the consumer would be standard. Air singleconductor line is designed for the transmission of electrical power from the resonance system to Consumer. Thanks to its structural features, lighter poles with light insulators. As the small diameter of a hybrid wire its capacity per unit length is small and the line could be great length. Changes in the electrical parameters of the coaxial line due to weather accounted automatic PBRS. When open circuit or earth fault comes its electrical parameters and resonant mode changes and the line is de-energized. Terrestrial single-conductor line as intended for transmitting electrical power from the transmitting unit resonance system to the consumer. An other great feature of the cable line it is not deep laying in the ground needed.

When you open or short circuit come to ground it in the same way as the air line is de-energized than, but if for some reason it it does not happen, then the high-frequency voltage will not cause the stepper voltage, and will not have the damaging effects on human electrically current. On the one-wire hybrid cable BOGEKS-3 line do not affect the weather or flooding. Its only drawback – it is the linear capacitance, reducing the transmission distance.



Transmission of electrical energy with resonant circuit in the receiving unit is designed for consumers with a constant load. Adoptive block consists of Tesla transformer and the capacitor unit and operates also in the resonant mode as the transmitting unit. Due to its Functional features of the unit is designed for power supply with stable electrical load, such as a stationary lighting, electric motors, operating in a stable manner. A feature of transmission of electric energy resonant circuit is in the receiving unit that when changing load transmission quality factor changes, and changes load voltage.

Receiving unit with a broadband transformer used for consumers with a dynamic load, consists of broadband transformer, rectifier and filter inverter to a standard output voltage, which automatically maintains a stable voltage hybrid line.

When electric power transmission from the single-conductor hybrid line to several different users located at a distance and mutually dependent, foster unit maintains a stable voltage for each consumer. The resonant singleconductor power transmission network distributed multi-users and multi distributed supply network units operating in the resonant mode creates a standing wave in the line mode.

Generating stations distributed along the hybrid line, automatically create a network standing mode waves, allowing distributed along the lines of getting consumers electricity with fewer losses. The resonant power supply consists of a transformer with primary winding and the capacitor unit to operate in a resonant mode, and secondary winding to produce on request voltage.

Induction heating system with a resonant power supply and hybrid line allows using active and reactive currents in the inductive circuit, exploit the technological equipment more effectively agricultural enterprises, while saving energy, means for heating elements, being able to automatically to carry out the heating in wide aisles.

And as we know frequencies sufficiently lower than the surface plasmon frequency, the waveguide supports a plasmon polariton mode that resembles, and indeed reduces to the conventional TEM mode like of the conventional coaxial transmission line, known in the radiotechnology.

Conclusions

1. Energy Saving, single-conductor system, working in a resonant mode at high frequency for rural electricity consumers can create more perfect technological approach to the electricity transmission. China Picture Yunnan-Guangdong transmission system and Denmark system are good example. These systems need to be use with non-metal cables that consist fiber optic lines for a final consumer line.

2. Block diagram of the resonant power transmission system It demonstrates the possibility of Energy Saving, single-conductor of electricity and communication transmission and supply of various process equipment for agricultural purposes.

3. The resonant power transmission system with hibryd cable "BOGEKS 3" allows create a variety of different technology options Energy Saving Systems, as well as to solve engineering tasks the quality of power supply a large plurality of electrical load types.

4. The transmitting unit resonance system using vibrational circuit, which includes a resonant Tesla transformer, coaxial hybrid line and condensing unit, able to feed the electrical energy through Air or single-conductor cable lines all kinds technology electrical systems for agricultural purposes.

5. Aerial and hybrid cable lines are capable of single-conductor transfer with minimal loss of energy from the transmitter resonance unit to the consumer.

6. Transfer of electrical energy in the resonant circuit the receiving unit is designed for consumers with a constant load. Electric power transmission in a broadband transformer the receiving unit is necessary for the user with a dynamic load.

7. When electric power transmission through a single-conductor hybrid lines of multiple different users located at a distance and are independent of each other, foster unit automatically supports stable voltage for each consumer.

8. The resonant single-conductor electrical transmission network energy distributed to several users and several distributed power generating stations

9. Creating a standing mode wave line saves power and much secure, when transmitting through hybrid line.

10. The induction heating power supply system with a resonance It allows using active and reactive currents in the inductive circuit, more effectively exploit the agricultural processing equipment destination at cold regions.

11. The calculation of a transformer's parasitics, such as its self capacitance, is fundamental for predicting the frequency behavior of the device, reducing this capacitance value and moreover for more advanced aims of capacitance integration and cancellation. 12. An open-ended coaxial line was used as a sensor in measurement of the permittivity of lossy dielectrics at radio and microwave frequencies. A simplified equivalent circuit related the permittivity to the measured input reflected coefficient. A more complete equivalent circuit is proposed and errors in the permittivity measurements resulting from the simplification are analyzed.

Resonant electric power systems with the use of single-line waveguide lines at high frequency are existed. The results of comparison of classical electrical engineering with resonant electrical engineering proposed by Nicola Tesla 100 years ago, are given. In such characteristics as current density and hybrid line losses, energy transmission distance, transmission capacity, the possibility of cable and wireless power transmission the Tesla electrical systems exceed the classical energy supply systems. The future world energy model based on solar energy and N. Tesla technologies for electric power transmission is suggested. The ten trends of the future development and application of resonant systems for electric power transmission are described. In future electrified mobile robots with external wireless electric power supply will allow to organize agricultural production on the principle "Industrial factories on the fields" with full automation of technological processes.

References

1. Bank, M. (2012). One-Wire Line System for Transmitting Energy or Information // International Journal of Communications. – N_{2} 6(2).

2. Bobowski J.S., Johnson T. (2012). Permittivity measurements of biological samples by an open-ended coaxial line // Progress In Electromagnetics Research. – 2012. – 40 (February). – P. 159–183. – http://doi.org/10.2528/PIERB12022906.

3. Boillat D. O., Kolar J.W. Integrated isolation and voltage balancing link of 3-phase 3-level PWM rectifier and inverter systems. In 2014 // International Power Electronics Conference, IPEC-Hiroshima – ECCE Asia 2014. – 2014. – P. 1073–1080). IEEE Computer Society.

4. Hayati M., Sheikhi A., Grebennikov A. Effect of Nonlinearity of Parasitic Capacitance on Analysis and Design of Class E/F3 Power Amplifier // IEEE Transactions on Power Electronics. – 2015. – № 30(8). – P. 4404–4411.

5. Gajda G., Gajda G., Stuchly S.S. An Equivalent Circuit of an Open-Ended Coaxial Line // IEEE Transactions on Instru-

mentation and Measurement. – 1983. – № 32(4). – P. 506–508. – http://doi.org/10.1109/TIM.1983.4315125.

6. Gudmundsdottir U.S. (2010). Modelling of long High Voltage AC Cables in the Transmission System. Ph.D Thesis (AAU). – Retrieved from http://vbn.aau.dk/ws/files/47642243/ unnur_stella_gudmundsdottir.pdf.

7. Strebkov D.S. Nikola Tesla and future of electric power engineering // In Proceedings of the 24th International Conference on Efficiency, Cost, Optimization, Simulation and Environmental Impact of Energy Systems, ECOS 2011. – 2011. – P. 144–152. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84903591623&partnerID=tZOtx3y1.

8. Strebkov D.S. Lectric power systems on the basis of N. Tesla technologies // In Conference Proceeding – 5th International Conference, TAE 2013: Trends in Agricultural Engineering 2013. – 2013. – P. 25–32. – Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84900028074&partnerID=tZOtx3y1.

9. Lyu J., Cai X., Molinas M. Frequency Domain Stability Analysis of MMC-Based HVdc for Wind Farm Integration // IEEE Journal of Emerging and Selected Topics in Power Electronics. – 2016. – № 4(1). – P. 141–151. – Retrieved from http://ieeexplore.ieee.org/lpdocs/epic03/wrapper. htm?arnumber=7320962.

10. Liu Z., Zhan Y., Shi G., Moldovan S., Gharbi M., Song, L., ... Ajayan P.M. Anomalous high capacitance in a coaxial single nanowire capacitor // Nature Communications. – 2012. – № 3(JUNE). – P. 879. – http://doi.org/10.1038/ ncomms1833.

11. Mak S. Speed of radio waves along a coaxial transmission line // American Journal of Physics. – 2004. – http://doi. org/10.1119/1.1629089.

12. Nami A., Liang J., Dijkhuizen F., emetriades G.D. (2015). Modular multilevel converters for HVDC applications: Review on converter cells and functionalities // IEEE Transactions on Power Electronics. Institute of Electrical and Electronics Engineers Inc.

13. Navarro-Cía M., Beruete M., Sorolla M., Maier S.A. Enhancing the Dual-Band Guiding Capabilities of Coaxial Spoof Plasmons via use of Transmission Line Concepts // Plasmonics. $-2011. - N \ge 6(2). - P. 295-299. - http://doi.org/10.1007/s11468-011-9203-x.$

14. Peng Y., Wang X., Kempa K. TEM-like optical mode of a coaxial nanowaveguide // Optics Express. – 2008. – № 16(3). – P. 1758–1763. – http://doi.org/10.1364/OE.16.001758

15. Shu H.C., Sun S.Y., Song, Q.L., Dai Y.T., Zhang M., Wang Y.N. (2009). Full process dynamic voltage stability of 2015 Yunnan-Guangdong ultra-high voltage AC/DC hybrid transmission system // In 1st International Conference on Sustainable Power Generation and Supply, SUPERGEN '09.

16. Xu L., Fan L., Miao Z. DC Impedance-Model-Based Resonance Analysis of a VSC–HVDC System // IEEE Transactions on Power Delivery. – 2015. – № 30(3). – P. 1221–1230. – http://doi.org/10.1109/TPWRD.2014.2367123.

17. Wang J., Luerkens P., Haan S. W.H. De, Verweij M.D., Ferreira J.A. Effect of material technologies on equivalent structural parasitic capacitance of high-voltage cascade rectifier // Proceedings of the 2011 14th European Conference on Power Electronics and Applications. -2011. - N = 1-10.

Materials of Conferences

NUCLIDE STRUCTURE AND THEIR CONTENT IN FRUITS OF HIPPOPHAE RHAMNOIDESH L.

¹Hovalyg N.A., ²Toropova E.Yu.

¹Tuva State University, Kyzyl, e-mail: Hovalyg.nadejda@yandex.ru; ²Novosibirsk state agricultural university, Novosibirsk, e-mail: helento@ngs.ru

Medicinal value and value for dietary food, was important to study content of chemicals in sea-buckthorn fruits. The abiotic stress is important selective force in evolution of cultural plants. Researches on identification of nuclide structure found in the quantities exceeding maximum concentration limit, microdoses shown in the form of traces, in the form of isotope and not isotope values in fruits of a sea-buckthorn of Southern Siberia are conducted. Open agrofitotsenoza and natural ecosystems which they cultivate a frost-resistant gigrofil in different conditions are characteristic of a sea-buckthorn. Fruits of Hippophae rhamnoidesh L are researched., sea-buckthorn fitotsenoza and the main products of agrobusiness of the growing Republic central Tuva Depression Tyva.

Content of pollyutant, in fruits of a sea-buckthorn determined by results of the toxicological analysis. The toxicological analysis allows to determine amount of toxic substances and a condition of loading (an indicator - toxic loading) coming to objects. Than less this indicator, especially is eco-friendly and we accept toxic substances [4, 5]. Pesticides, heavy metals, radionuclides belong to toxic substances. It represents the most obvious factor limiting distribution of plants and productivity of a harvest [3]. Open agrofitotsenoza and natural ecosystems which they cultivate a frost-resistant gigrofil in different conditions are characteristic of a sea-buckthorn. Chemicals provide development of plants, are intensively extracted from the soil and with dying off of plants arrive to the soil [1, 2] again. Organic substance of an edafon significantly influences its accumulator function who is created and form in slow-moving complex connections to inaccessible plants. Production of ecologically safe products is possible in an edafonny biotic complex with optimum content of the pollyutant who are not exceeding admissible levels. Value them can be understood, on chemical properties [9, 11]. Pollyutanta of different groups of toxicity are found in waters of the river Elegest and the light brown soil of Chedi-Holsky district where artificial fitotsenoza of a sea-buckthorn are located, in concentration maximum concentration

limit is lower. The exception was constituted by cadmium, concentration which in water of the river Elegest I exceeded maximum concentration limit though it was in sea-buckthorn fruits below admissible level [8]. Nature of bushes in natural fitotsenoza of a sea-buckthorn with prevalence of plants of 5–15 years which are during mass and steady fructification [7] is established unevenage (1–20 years). The most extensive areas of natural fitotsenoz of a sea-buckthorn in Siberia are revealed in Tyva, Buryatia, in Altai [10].

Materials and methods of research. Hippophae rhamnoidesh L. were objects of research., fruits of a sea-buckthorn krushinovidny sea-buckthorn fitotsenoza the mouth of small rivers Chyrgaky, Hemchik of Duzun-Hemchiksky district, the mouth of small rivers Torgalyk, Chats, Shagonar of Ulug-Hemsky district and the main products of agrobusiness the growing town of "Saryg-Alaak" of Chedi-Holsky district, the Republic of Central Tuva Depression Tyva. The purpose - determination of quantitative content of radioactive materials and quality of fruits of a sea-buckthorn, as food product. A task - studving of content of mobile forms of radioactive materials in fruits, studying of a condition of landings of a sea-buckthorn and identification of a main type of a pollutant with the exceeding residual quantity in sea-buckthorn sites in the conditions of Tuva. Methods of researches on identification of pollyutant are performed by standard methods in fruit and vegetable products.

Results of research and their discussion. On the basis of the toxicological analysis results are received and mobile forms of the radioactive materials containing in fruits of a sea-buckthorn are determined and their availability is revealed. Receipt them in a plant is expressed in the minimum quantity of a gross inventory of cumulative radionuclides that causes danger of pollution of products rural and forestry. Content and accumulating of nuclide contents happens through a soil and biotic complex on vascular system of plants, and sometimes on air flows, through a sheet surface. Organic substance of an edafon significantly influences its accumulator function who are created and form in the form of slow-moving complex connections with inaccessible substances for consumption by plants. The found indicators on areas, do not reach admissible level. High content of caesium-137 is revealed in the second option, in Ulug-Hemsky district in a phase of maturing of fruits in number of 2,4 Bq/kg that is 0,39 Bq/kg more, than the first option. The found quantity in fruits shows them about its movement on vascular system, in process of intensity of growth

of plants, at the same time process of absorption of substances plants increases. A condition of toxic loading in fruits of Hippophae Rhamnoidesh L. minimum. Thus, in case of regular environmental monitoring on content of pollyutant in fruits of a sea-buckthorn it is more reliable to prepare them for dietary food in natural sea-buckthorn (remoteness of fitotsenoz from urbanosisty, showing about low contact with different types of pollutants) and artificial fitotsenoza of a sea-buckthorn, in concentration are lower than maximum concentration limit. The exception was constituted by cadmium, concentration artificial fitotsenoza (observance of technology of cultivation of sortoobrazts, without violation of engineering procedures). The radiological analysis on content of isotope substances in fruits of a sea-buckthorn can draw the following conclusions that radionuclides:

1) are found in the minimum quantities;

2) do not exceed admissible level;

3) in fruits of a sea-buckthorn does not accumulate isotopes.

References

1. Arkhipov A.N., Ozornov A.G., Pilipchuk T.V, Paskevich S. A. Receipt of Cs-137 and Sr-90 in plants depending on forms of the dropped-out radionuclides and their behavior in meadow tsenoza the III Congress on radiation researches, Russia. – M., 15–17 10.97 1997.

2. Guseynova I.M., Suleymanov S.Yu., Aliyev D.A. Proteinaceous structure and a native condition of pigments the tilakoidnykh of membranes of genotypes of wheat with various tolerance to a water stress // Biochemistry. – 2006. – Vol. 71, issue 2. – P. 223–228.

3. Fgoats V. Reference book on radiation safety. – M.: Energoatomizdat, 1987.

4. Pilipchuk T.V., Arkhipov A.N., Ivanova V.E., Paskevich S.A. Studying of migration of radinuklid of Cs-137 and Sr-90 in a chain link the soil plant – a pcheloproduktion the III Congress on radiation researches, Russia. – M., 15–17 10.97 1997.

5. Toropova E.Yu., Hovalyg N.A. Biological diversity and productivity in natural fitotsenoza of Tyva // Fruit growing and a yagodovodstvo of Russia. -2013. - N = 2. - T. 37. - P. 223-231.

6. Toropova E.Yu., Hovalyg N.A. Ekologicheskaya an assessment of habitats of a sea-buckthorn in the Republic of Tyva // Basic researches. – 2014. – № 11 (8). – P. 1732–1735.

7. Hovalyg N.A., Ayushinov E.D. Ecotoxicological condition of a sea-buckthorn site "Saryg-Alaak" of Chedi-Holsky district of the Republic Tyva // Recommendation to production. – Kyzyl: Publishing house of TYVGU, 2006. – 54th p.

8. Hovalyg N.A. Bioresource potential of a sea-buckthorn in natural fitotsenoza of Tyva / N.A. Hovalyg, E.Yu. Toropov, V.A. Chulkin // Siberian messenger of agricultural science. – 2012. – № 3. – P. 42–48.

9. Aliyev J.A. Photosynthesis: Mechanisms and Effects (Garab, G. ed.), Kluwer Academic publishers. – Dordrecht, Boston, London, 1998. – P. 3829–3832.

The work is submitted to the International Scientific Conference *«Priority development of agricultural technologies»*, Netherlands (Amsterdam), October, 20–26, 2016, came to the editorial office on 14.08.2016.

ANALYSIS OF ENVIRONMENTAL STATUS OF THE KECHUT ARTIFICIAL RESERVOIR

Simonyan A.G., Simonyan G.S., Pirumyan G.P. Yerevan State University, Yerevan, e-mail: gevorg.simonyan@ysu.am

For evaluation of water contamination degree the comprehensive indicators are used which take possible to evaluate the contamination of water at the same time on a wide range of quality indicators. The study of ecological status of Republic Armenia Rivers is importance both for evaluation of water quality of that objects and for their further rational use. Development of water quality assessment methods using conventional indicators comprehensively taking into account various properties of surface water is an important issue. It must be noted that most developed complex characteristics of water object in one way or another connected with the existing maximum permissible concentration (MPC).

In the last years we suggest Entropic water guality index (EWQI) and Armenian water guality index (AWQI) for evaluation surface water quality [1].

The aim of presented paper is evaluation of Kechut Artificial Reservoir by Armenian Water Quality Index.

The following computational algorithm is used for determination EWQI and AWQI values:

1. Determines the number of cases of MPC excess of i-substance or indicator of water -n.

2. Estimates the total amount of cases the maximum permissible concentration $(N) - N = \sum n$.

3. Computes $\log_2 N$, $n \log_2 n$ and $\sum n \log_2 n$.

4. Determines geoecological syntropy (I) [1] and Shannon entropy (*H*):

$$H = \log_2 N - \sum n \log_2 n/N;$$
$$I = \sum n \log_2 n/N;$$

 $H = \log_2 N - I.$

5. Then EWQI is determined: G = H/I.

6. Further, the total amount multiplicity MAC exceedances is estimated (M) –

7. Computes $\log_2 M$.

8. Armenian Water Quality Index was obtained:

AWQI =
$$G + 0.1 \cdot \log_2 M$$
.

Kechut Artificial Reservoir on the Arpa River, 3,5 km south of the resort town of Jermuk. Reservoir with an area of 145 hectares, the total amount – 23 million cubic meters, the average depth – 20 m, coastline length – 8,5 km [3]. Kechut Artificial Reservoir has one monitoring post: number 114. It was established that the Kechut Artificial Reservoir water of the regularly exceeded the value of contaminated by some metals. Thus, in the Reservoir water is regularly increased MPC of copper, vanadium, aluminum, chrom, manganese and selenium.

For example, in the 2012 year of Kechut Artificial Reservoir V, Al, Cu, Cr, Mn and Se number of MPC increasing cases is 9, 5, 5, 4, 5 and 2 times, respectively. The amount of excess cases of MPC –

$$N = 30; \qquad \sum n \log_2 n = 73, 3;$$

$$I = 73, 3/30 = 2, 44;$$

$$H = \log_2 30 - 2, 44 = 4, 9 - 2, 44 = 2, 46;$$

G = 2.46/2.44 = 1.0.

The total amount of the multiplicity of MPC exceedances –

$$M = \sum m = 14,1;$$

 $\log_2 M = 2,82;$

$$AWQI = 1,008 + 0,282 = 1,290.$$

Entropic and Armenian water quality indexes
for Kechut Artificial Reservoir

Year	EWQI	AWGI
2009	0,301	0,575
2010	0,530	0,885
2011	0,350	0,822
2012	1,008	1,290

Analysis of obtained data indicate that AWQI has liner dependence with EWQI:

AWQI = $(0,410 \pm 0,112) + (0,882 \pm 0,183)$ ·EWQI;

$$R = 0.95956; N = 4$$

Thus, for the first time using AWQI the quality of Kechut Artificial Reservoir water evaluate. It was shown that the quality of water of the Reservoir from the first to the second class of pollution.

References

1. Simonyan A.G. Analysis of environmental status of the river Voghji with Armenian index of water quality // Proceedings of YSU, Series Cemistry and Biology. – 2016. – № 2. – P. 20–24.

2. Simonyan G.S. Assessment of hydrogeological systems in the light of information theory synergistic // Proceedings of the All-Russian scientific-practical conference. Environmental safety and Nature: Science, Innovation, upravlenie. – Mahachkala: ALEPH, 2013. – P. 275–280.

3. Shannon C. Works on information theory and cybernetics. – M.: IL, 1963. – 830 p.

The work is submitted to the International Scientific Conference «Ecology industrial regions of Russia», Great Britain (London), October, 15–22, 2016, came to the editorial office on 26.08.2016.

ANALYSIS OF ENVIRONMENTAL STATUS OF THE RIVERS SISIAN AND GORIS WITH ARMENIAN INDEX OF WATER QUALITY

Simonyan A.G., Pirumyan G.P. Yerevan State University, Yerevan, e-mail:sin-simov@nail.ru

Water Contamination Index (WCI), Canadian Water Quality Index (CWQI) and Specificcombinatorial Water Quality Index (SCWQI) are used for evaluation surface water quality in Republic of Armenia. It must be noted, that most developed complex characteristics of water object in one way or another connected with the existing maximum permissible concentration (MPC). In the last years we suggest Entropic Water Quality Index (EWQI) and Armenian Water Quality Index (AWQI) for evaluation surface water quality [1]. The aim of presented paper is evaluation of Rivers Sisian and Goris by Armenian Water Quality Index.

River Sisian - right tributary of the Vorotan. The river is 33 km. On Sisian river located positions: number 103 - 0.5 km above the Arevis and number 104 – at the mouth of the river. River Goris leght tributary of the Vorotan. Goris is 29 km long. Two monitoring posts located on the river Goris: number 106 - 3,0 km above the city of Goris, number 107 - 1.5 km below the city of Goris. It was established that the water of the Rivers Sisian and Goris regularly exceeded the value of BOD₅ and concentrations of nitrite and ammonium ions, due to water pollution by domestic wastewater. It was shown that water of Rivers Sisian and Goris is also contaminated by some metals. Thus, in the river water is regularly increased MPC of copper, vanadium, aluminum, cobalt, manganese and selenium. For example, in the position № 107 of River Goris BOD₅, NH⁺₄, NO⁻₂, V, Cu, Al, Cr and Se number of MPC increasing cases is 4, 12, 12, 12, 11, 4, 5 and 1 times, respectively. The amount of excess cases of MPC -

$$N = 61;$$
 $\sum n \log_2 n = 194,6;$
 $I = 194,6/61 = 3,19;$

 $H = \log_2 61 - 3, 19 = 2, 74, G = 2, 74/3, 19 = 0, 86.$

The total amount of the multiplicity of MPC exceedances –

$$M = \sum m = 39,2;$$
 $\log_2 M = 5,37;$
AWQI = 0,86 + 0,537 = 1,397.

Analysis of obtained data indicate that AWQI has liner dependence with WCI, SCWQI, EWQI and an inverse dependence with CWQI:

$$AWQI = (0.838 \pm 0.215) + (0.079 \pm 0.065) \cdot WCI;$$

R = 0,65178; N = 4;

EUROPEAN JOURNAL OF NATURAL HISTORY № 1, 2017

70

AWQI = $(0,229 \pm 0,554) + (0,514 \pm 0,340)$ ·SCWQI;

$$R = 0,73018; N = 4;$$

AWQI = $(0,225 \pm 0,154) + (1,290 \pm 0,232)$ ·EWQI;

$$R = 0.96899; N = 4;$$

AWQI = $(3,082 \pm 1,044) - (0,025 \pm 0,013)$ ·CWQI;

$$R = 0,81023; N = 4.$$

Thus, for the first time using AWQI the quality of Rivers Sisian and Goris water evaluate. It was shown that from the source to the mouth of the river there is an increase in the value of the AWQI, which indicates the decline in the quality of water of the rivers from the first to the second class of pollution.

References

1. Simonyan A.G. Analysis of environmental status of the river Voghji with Armenian index of water quality // Proceedings of YSU, Series Cemistry and Biology. -2016. $-N_{2}$ 2. -P. 20–24.

The work is submitted to the International Scientific Conference *«Nature management and environmental protection»*, France (Paris), October, 19– 26, 2016, came to the editorial office on 26.08.2016.

WATER QUALITY ASSESSMENT "YEREVAN LAKE" ARTIFICIAL RESERVOIR

Simonyan A.G., Simonyan G.S., Pirumyan G.P.

Yerevan State University, Yerevan, e-mail: gevorg.simonyan@ysu.am

In the last years we've suggested Entropic water guality index (EWQI) and Armenian water guality index (AWQI) for evaluation surface water quality [1].

Development of water quality assessment methods using conventional indicators comprehensively taking into account various properties of surface water is an important issue. It must be noted that most developed complex characteristics of water object in one way or another connected with the existing maximum permissible concentration (MPC). The aim of presented paper is evaluation of «Yerevan Lake» Artificial Reservoir by indexes of water quality. Five indexes of water quality (IWO) which differ on structure, applicability and used approaches were used for this purpose. The Water Contamination Index (WCI), Canadian Water Quality Index (CWQI), Specific-combinatorial Water Quality Index (SCWQI), EWQI and AWQI.

The artificial reservoir «Yerevan Lake» is located on the south-west of Yerevan. It was built in the gorge of the river Hrazdan in 1963 –1966. The lake is situated at an altitude of 908 m above sea level, has an area of $0,65 \text{ km}^2$, average depth – 8 m, and the maximum – 18 m, water volume of approximately 5 million m³ [2]. «Yerevan Lake» Artificial Reservoir has one monitoring post: number 112. It was shown that water of the reservoir is polluted by biogenic substances and heavy metals. Thus, in the Reservoir water is regularly increased MPC of copper, vanadium, aluminum, and selenium. For example, BOD₅, NH⁴₄, NO⁻₂, V, Cu, Al and Se number of MPC increasing cases is 6, 10, 12, 12, 10, 7 and 6 times respectively. The amount of excess cases of MPC –

$$N = 63; \quad \sum n \log_2 n = 203,04;$$
$$I = 203,04/63 = 3,22;$$
$$H = \log_2 63 - 3,22 = 2,75;$$

EWQI = H/I = 2,75/3,22 = 0,855.

The total amount of the multiplicity of MPC exceedances –

$$M = \sum m = 36,3; \quad \log_2 M = 5,18;$$

AWOI = EWOI + 0.1:

 $\log_2 M = 0.855 + 0.518 = 1.373.$

Analysis of obtained data indicate that AWQI has liner dependence with WCI, SCWQI, EWQI and an inverse dependence with CWQI.

References

1. Simonyan A.G. Analysis of environmental status of the river Voghji with Armenian index of water quality // Proceedings of YSU, Series Cemistry and Biology. – 2016. – № 2. – P. 20–24.

2. Chilingaryan L.A., Mnatsakanyan B.P., Agababyan K.A., Tokmadzhyan O.V. Hydrography of rivers and lakes in Armenia. – Yerevan, 2002. – P. 44.

The work is submitted to the International Scientific Conference «Environmental monitoring», Italy (Rome, Florence), September, 6–13, 2016, came to the editorial office on 26.08.2016.

THE STUDY OF THE DIVERSITY OF SPECIES OF TREES AND SHRUBS ON THE SCHOOL № 45 IN ARKHANGELSK

Ulyanovskiy V.A., Belova S.V.

School № 45, Arkhangelsk, e-mail: ulyanovskayas@mail.ru

Objective. To create an electronic mini-encyclopedia of species of trees and shrubs growing in the school $N \ge 45$ city of Arkhangelsk. In our city a lot of environmental problems: dustiness, high concentration of toxic emissions, noise levels in excess of the maximum allowable health norm, and others. In addressing these issues play huge role greenery. School $N \ge 45$ is situated on Sadovaya Street, in the heart of Arkhangelsk in the vicinity of roads, buildings, market. On school grounds planted with different species of plants, which are designed to improve the quality of life and work of children and adults. About the city, its culture and the improvement of the inhabitants can be judged by the appearance of its streets, courtyards, schools territories.

The territory of the school is to become green on the pre-arranged plan.

1. I studied the main types of vegetation.

2. The range of planting material for landscaping of the city of Arkhangelsk, which can be used on school grounds.

3. Some rules of care for plants.

4. Main climatic factors affecting the growth and development of plants: light, heat and moisture.

On the territory of the school № 45 grow deciduous trees, conifers and deciduous shrubs. Deciduous trees: Betulaceae, Salix L., Acer platanoides, Sorbus aucuparia. Conifers: Pinus sibirica, Pinus sylvestris L. Listvennye shrubs: Arónia melanocárpa, Amelanchier ovalis, Viburnum opulus L., Syringa vulgaris L., Physocarpus opulifolius, Rosaceae. Conclusions:

1. School № 45 vegetated land as planned.

2. When planting and placing plants accounted for the basic principles of landscaping and climatic conditions.

3. All pupils and school staff want to see a beautiful school park.

Recommendation:

1. Plant near school blue spruce and larch.

2. Each class having its nominal alley and take care of it.

3. In honor of the director L.V. Elkina and teachers to plant cherry-apple orchard.

The work is submitted to the International Scientific Conference «Ecology industrial regions of Russia», Great Britain (London), October, 15–22, 2016, came to the editorial office on 03.10.2016.
ETHNIC FEATURES OF ORNAMENTAL CULTURE AND TUVA ORNAMENT "KINDNESS, MUTUAL UNDERSTANDING AND WELLBEING"

¹Khovalyg U.A., ²Khovalyg1 N.A.

¹MOE SOSH "Chyraa-Bazhinsky high school", Duzun-Hemchiksky district, Republic of Tyva, Chyraa-Bazhy, e-mail: Khovalyj68@mail.ru; ²Tuva State University, Kyzyl, e-mail: Hovalyg. nadejda@yandex.ru

Each people are highly honored by traditions of the edge and love the culture – culture of the ancestors. The ornament is a special type of art creativity. In historical monuments of Tuva motives of patterns were known and they are connected with ancient cultures of a steppe zone. It is possible to distinguish system of symbols of color and system of Buddhist signs from the symbols used in national clothes of Tuvinians. At the head of system of flowers in the Tuva culture it is located white color, "mother color" - the most sacred and desired symbol of purity, nobility, wellbeing, wealth which has got into Tuva together with the Buddhism a Lamaism. The Tuva ornament is in essence presented in the form of the sign "eight", that is an infinity sign. At an ornament is not present I have begun, the end, and it suggests a certain philosophical idea "about eternal values of national traditions". The things decorated with an ornament from regular pieces of house utensils turned into objects of ritual traditions, for example, became charms. The Tuva ornament created by us will bear in itself kindness, mutual understanding and wellbeing. Motives to serve as a charm of family rest in the created ornament.

Ornament – one of the most ancient types of graphic activities of the person bearing in itself symbolical and magic sense, significance, semantic function. Researchers of an ornament consider that it has arisen already during a verkhnepaleolitichesky era (15-10 thousand years BC). Differentiate four types of functions: the most ancient - magic, decorative - ornament, information - data, mental - emotional. The ornament is conventional signs, symbols by means of which the person expresses the relation to natural phenomena. Studying of an ornament – the special section of the art letter which knowledge is necessary for all. The ornament is very ancient, but also now I have not lost the relevance. If to pass around the city either what - or to the village can see an ornament on houses [1-7].

Purpose: Studying of history and features of ornaments in the fine arts. Preserving the most valuable property of cultural heritage of Tuvinians. The ornament purpose – to decorate, something.

Tasks:

1) To consider the place of a decor and ornament in art.

2) Studying of the main features of the Tuva ornament.

Materials and methods of research. Terminological. Matching and studying of materials on ornaments in the fine arts.

Results of research and their discussion. Knowledge of culture of heritage of the people.

Tuva is a unique corner of the planet where are fancifully combined also highlands with the Alpine meadows, both a mighty Siberian taiga, and the southern sandy deserts where herds of reindeers wander. It is an ancestral home of such most ancient people as Scythians, Turkic peoples whose barrows, stone sculptures and steles with texts are scattered on all its territory. On products from various materials the motive of an interlacing often meets (in Tuva "olchy udaizen").

The Tuva ornament is in essence "eight", that is an infinity sign. At an ornament is not present I have begun, it suggests a certain philosophical idea of eternal values of national traditions".

The ornament created by us will bear in itself kindness, mutual understanding and wellbeing. The product decorated with such ornament will symbolize a strong and healthy family where the mother Priroda and the person - her child will be the main members of this family. Keeping traditions, women's mittens, a set for the girl have been made: the bag and mittens, have created new motive of an ornament, have made a badge emblem of the Skilled worker circle with use of an ornament. For a preservation of peace on the earth a all of us have to honor to remember and keep, transferring from generation to generation traditions of the people, to respect traditions of those people which live with us nearby closely conduct economy, live in one territory, heat and kindness wishing each other. In a color system of the Tuva ornament red, blue, blue, green, brown and yellow paints prevail. The highest position is held by white food, cattle of white color, a white yurta, the person with white soul, white clothes. Buddhist signs matter, namely: Happiness thread - endless love and compassion to all living beings; The Vessel – long life; The Swastika – durability; Gold fishes – harmony; The Lotus – purity; Vadzhra – a spiritual method; Chintamani – fulfillment of desires. As a charm of inviolability of the family center considered a typical central aizyaitsion diamond-shaped pattern of "khan-karak" (in Tuva) which quilted a high collar.

The things decorated with an ornament from usual pieces of house utensils turned into objects of ritual traditions, for example, became charms. Motives can serve in the ornament created by us as a charm of family rest.

References

1. Weinstein S.I. The world of nomads of the Center of Asia. – M.: Science, 1991. – the 296th. – P. 165.

2. Weinstein S.I. History of folk art of Tuva. – M.: Science, 1974. – 224th p.

3. Rook A.D. Ancient nomads in the center of Asia. Tuva research institute of language, literature and history. – M.: Science, 1980. – 256th p.

4. Katanov N.F. Sketches of the Uryankhaysky earth. The diary of the travel executed in 1889 // Podg. manuscripts, A.K. Kuzhuget's comment. – Kyzyl, 2011. – 669 p.

 $5.\ http://nsportal.ru/ap/library/khudozhestvennoprikladnoetvorchestvo/2013/02/06/ornament-ayak-kheezi.$

6. http://one_vision.jofo.ru/820453.html.

7. http://pandia.ru/text/78/276/21111.php.

The work is submitted to the International Scientific Conference «Russias cultural heritage and the modern world», Great Britain (London), October, 15–22, 2016, came to the editorial office on 14.08.2016.