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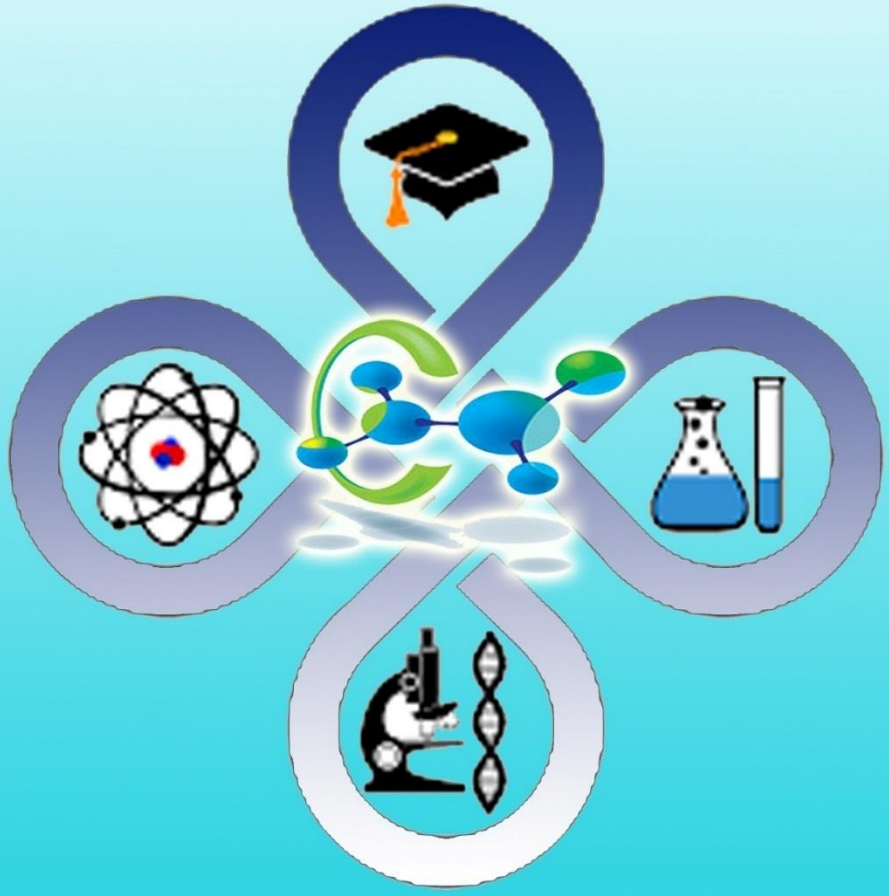
ACTUAL PROBLEMS OF MODERN SCIENCE, EDUCATION AND TRAINING IN THE REGION

АКТУАЛЬНЫЕ ВОПРОСЫ СОВРЕМЕННОЙ НАУКИ, ОБРАЗОВАНИЯ И ВОСПИТАНИЯ В РЕГИОНЕ



ISSN

ACTUAL PROBLEMS OF MODERN SCIENCE, EDUCATION AND TRAINING IN THE REGION

1
2017

Electronic scientific edited volume

Publishing 4 times per year

UDC: 519.95

SEARCHING THE REGULARITIES ON SOCIOLOGICAL RESEARCH DATA OF MENTALITY

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Abstract. In this paper the problems of a filtration of objects for metric algorithms of classification in particular, for an algorithm of the K nearest neighbors is considered. It is invited to change the class of anomalous objects which has similar regularities to improve the stability. First result and second result which was taken after the preprocessing are compared.

Annotatsiya. Mazkur maqolada metrik klassifikatsiya algoritmlari, hususan yaqin qo`shni algoritmi uchun obektlarni filtrlash masalasi qaraladi. Turg'unlikni yaxshilash uchun o'xshash qonuniyatlarga ega bo'lgan anomal obektlarning klasslarini o'zgartirish taklif qilindi. Dastlabki natijalar va qayta ishlangandan keying natijalar solishtirildi.

Резюме. В данной работе рассматривается задачи фильтрации объектов для метрических алгоритмов классификации в частности, для алгоритма ближайщих соседей. Чтобы улучшить устойчивость экспериментальных данных предлагается изменить класс аномальных объектов, у которого есть малая закономерность. Сранивается результаты начальной вычисления с результатами вычислений после предобработки.

Key words: Stability of object, Anomalous objects, estimation of complexity of the algorithm.

Калит сўзлар: Объектлар барқарорлиги, аномал объектлар, алгоритм мураккаблигини баҳолаш.

Ключевые слова: Устойчивость объектов, аномальные объекты, оценки сложности алгоритма.

Introduction

Today is known a large number of modifications of an algorithm the K nearest neighbors which is directed to increase the quality of classification and enrichment of algorithmic model by entering additional parameters.

Exception of noise objects from teacher pattern raises the generalizing ability of the method of the K nearest neighbors and significantly reduces costs of time for classification of new objects

Many algorithms are developed for definition of noise objects, but in this article for the first time is considered detection of noise objects by the K nearest neighbors where model of finding the K offered by N.A. Ignatev.

Different types of features in the description of objects does not allow to use as a tool for the study of methods of statistical exploratory data analysis. To solve

this problem it is offered to use the methods of data mining oriented on search of the hidden regularities in databases.

One of the directions of the intellectual analysis is classification. The considerable volume of information at the solution of problems of classification represents knowledge for structural placement of class objects and complexity of a configuration in borders of classes.

Data on structural placement of objects of classes in feature space for a given metric. we tried to get a variety of ways. For example, about complexity of a configuration in borders of classes it was possible to judge by results of correct recognition of objects by means of linear, piecewise and linear decision functions[1]. Another feature was the use of structural stability of the objects in the disjoint classes. The problem of calculating the stability of a variety of structural measures are being considered within the framework of nonparametric methods of recognition.

Stability shows the local properties in the sample of classified objects. Knowledge of these properties is necessary to determine the anomalous object classes, explaining the reasons for choosing the objects of the minimum coverage standards of learning sample, sufficient for its correct recognition.

The variety value of stability of objects of classes in[2] depended on the choice of the metric. As in polytypic feature space there are no proximity measures with properties of a metrics, it was necessary to use different approaches. Thus, the structural characteristics of the placement of each of the ethalon objects locally and optimal coverage $\Pi_j = \{S^1,...,S^p\}, p>1$ class training sample in artificial neural networks (ANN) with minimal configuration was calculated through a share incorrectly recognized objects during the exam on a set of a moving Π_j.The solution of a problem of an estimstion of stability and algorithmic (without the participation of experts) ranking objects of classes on generalized estimates in heterogeneous feature space had not previously considered.

Statement of the problem

We consider the problem of recognition in the standard formulation. It is believed that given a set of objects $E_0 = \{S_1,...,S_m\}$ contained representatives l disjoint classes $K_1,...,K_l$. Description of objects is performed using a set of n different types of features $X_n = (x_1,...,x_n)$, δ of which are measured in nominal scale, $n-\delta$ on an interval scale.

It is required to find and compare the stability of objects in initial data and after the preprocessing.

It is invited to use Juravlev metric in this data because all the features are nominal.

$$\rho_d(x,y) = \sum_{i=1}^{n} \begin{cases} 1, x_i \neq y_i \\ 0, x_i = y_i \end{cases}, \text{ if } X_n = (x_1,...,x_n) \text{ are nominal}$$

$\rho_d(x,y)=\sum_{i=1}^{n}|x_i-y_i|$, if $X_n=(x_1,...,x_n)$ are quantative

For each $S_i \in K_t$ construct a sequence $S_{i_1},S_{i_2},...,S_{i_{m-1}}$ of objects, E_0 is sorted with increasing order of distance S_i from the ρ_v metric and allocation of set of boundary pairs

$$\left\{\left(i_\mu,i_r\right)\right\},\quad 1\le\mu\le r\le l\left(\min_{1\le j\le l}m_j-2\right)+1,\quad m_j=\left|K_j\cap E_0\right|,$$

formed from the inequalities

$$\frac{\max\limits_{z\in\{1,...,l\}\setminus t} d_\mu^z}{\mu}<\frac{d_\mu^t}{\mu},\cdots,\frac{\max\limits_{z\in\{1,...,l\}\setminus t} d_r^z}{r}<\frac{d_r^t}{r}$$

where d_η^z ($\eta=\overline{\mu,r}$) - the number of objects from η nearest S_i, belonging to the class K_z, $z=\overline{1,l}$. Objects of class K_t make a relative majority for any integer $k\in\{\mu,\mu+1,...,r\}$ nearest objects to S_i.

The value of functionality F(k) is determined by quantity of the executed inequalities $\mu\le k\le r$ by a set of boundary pairs of $\{(i_\mu,i_r)\}$ of each object $S_i\in E_0$, $(i=\overline{1,m})$.

Stability of object of $S_i\in K_j$ on a metrics of $\rho_v\in R$ is calculated as

$$\lambda_i^{\,v}=\sum_{\left\{\left(i_\mu,i_r\right)\right\}}(r-\mu+1)/(2\min_{1\le t\le l}m_t-3)$$

and class

$$y_j=\sum_{S_i\in K_j}\lambda_i^{\,v}/m_j$$

Computational experiment

To illustrate the process visualization objects was used “Korean” [3] data (which is taken from sociology fields). The set is represented 100 objects with 24 nominal features. Objects are divided into two disjoint classes, K1(Uzbek people), K2 (Korean people). Results of stability of the objects in a given data are presented in Table1.

Table1: Stability of the objects in a given data

Number of Object	Stability
54	1.00
19	1.00
1	1.00
17	1.00
.....	.....
30	0.57
74	0.53
100	0.44
21	0.38
.....	.....
95	0.00
87	0.00
83	0.00
69	0.00

According to Table1 average stability of the first class and second class are equal to 0.74 and 0.69 respectively. Anomalous objects are located in the bottom of the tablle and is choosen according to the low stability. Anomalous objects are presented in Table2.

Table2: List of Anomalous objects.

Number of objects
95
87
83
57
45
23
84
53
49
75
15
10

we perform preprocessing through the changing of the classes of anomalous objects. Result for stability of the objects after the preprocessing is presented in Table3.

Table3: Stability of the objects after the preprocessing.

Number of Object	Stability
54	1.00
19	1.00
1	0.94
17	1.00
.....	.....
30	0.90
74	0.98
100	0.99
21	0.86
.....	.....
95	0.92
87	0.86
83	0.93
69	0.90

Conclusion

As we can see in above tables, stabilities of features were better after the preprocessing because we've changed the class of anamalous objects. For instance the stabilities of 95th and 85th objects were 0.00 in Table1 and it changed to 0.92 and 0.93 respectively after the preprocessing. Although the stability of first object decreased, the average stability of the first class and second class increased and were equal to 0.87 and 0.92 respectively. It means anomalous objects are nearer to other class objects than their class.

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UDC: 538.91

INFLUENCE OF NON-UNIFORM LATERAL INTERFACE DEFECTS DISTRIBUTION TO THE CURRENT-VOLTAGE CHARACTERISTIC OF MOSFET

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Abstract. In the paper the influence of the defect lateral distribution on drain current in nanometer MOSFET is considered.The simulation results show the drain current depends on lateral as well as longitudinal distribution of interface defects. Maximal change of the drain current is seen at localisation of defects at the center of interface.

Annotatsiya. Maqolada nanometr o`lchamdagi metall-oksid-yarimo`tkazgich tranzistorlar oksid-yarimo`tkazgich chegarasida zaryadlangan nuqsonlar notekis taqsimlanishining stok tokiga ta’siri o`rganilgan. Modellashtirish natijalari shuni ko`rsatadiki stok toki nuqsonlarning qanal bo`ylab va qanalga ko`ndalang yo`nalishda taqsimotiga bog`liq. Stok tokining eng katta o`zgarishi zaryad markazida joylashganda kuzatiladi.

Аннотация. В статье изученавлияние неоднородности бокового распределения заряженных граничных дефектов на ток стока в нанометровом МОП транзисторе. Результаты моделирования показывают, что ток стока зависит как от неоднородного распределения дефектовкак вдоль длины так и вдоль ширины канала. Максимальное изменение тока стока наблюдается при локализации дефектов в центре плоскости раздела.

Keywords: MOSFET, interface defects, transconductanse, gate, potential distribution.

**Kalit so`zlar:** MOY transistor, chegara nuqsonlari, o`tish voltamper harakteristikasi, zatvor, potencial taqsimoti.

Ключевые слова: МОПТ, граничные дефекты, передаточная вольтамперная характеристика, затвор, распределение потенциала.

Introduction

The requirement for increasing an integration degree of IC causes the development of MOSFETs with the size almost reaching the physical limits. The degradation effects arising at limit sizes induce the using of new materials. In particular, it is suggested the using of new dielectric materials with high as well new two dimensional semiconductor materials as channel in transistors. The using

of new dielectrics as well as new semiconductors creates new problems one of which is the research of interface defects. Up to this time many effective methods for research the type and concentrations of defects at the oxide-semiconductor interface in MOS structure and MOSFET is developed. Among them the method of the capacitance-voltage characteristics, the subthreshold current method, the charge pumping method and others can be noted [1-3All this method allows to determine the distributions of the charged defects in normal direction to the semiconductor surface and not allow to determine the lateral distribution along the dielectric-semiconductor interface. Scanning capacitance spectroscopy allow to determine the lateral distribution of defects however only in MOS structures and these methods has limit in scanning speed [4]. Therefore, the development of methods for research of lateral defect distributions along the dielectric-semiconductor interface is very important task.

Statement of the problem and simulation results.

In previous works we considered influence of non-uniform lateral distributions to capacitance-voltage characteristics of the source-substrate and drain-substrate junctions [5,6]. In this work we simulate influence of the different lateral distributions to the Id-Vg characteristics of the silicon n-MOSFET.

The 3D simulation was carried out with using TCAD Sentaurus [7]. Planar MOSFET with gate length and width of 50 nm was considered (Fig.1). Source and drain areas were doped by Arsenic with concentration of 10^{20}cm^{-3} and substrate was doped by Boronwith concentration of 10^{17}cm^{-3}. SiO_2oxide thickness is 1 nm. Polysilicon doped by Arsenic with concentration 10^{20}cm^{-3} is used as gate.

For modeling of non-uniform distribution of interface charge the interface was divided to rectangular areas with width of 2.5 nm along and across length of the channel (Fig 2). Id-Vg characteristics were simulated at position of charge on different divided areas of the interface border. The typical Id-Vg characteristics at 50mV on the source is shown in Fig.3.Relative changes of drain current at subthreshold voltage -1 V on the gate and 50mV on source, at local positions of the trapped charge on divided areas of interface border is shown in Fig.4. The surface density of charged defects was selected as10^{12}cm^{-2} The result shows the drain current has strong dependence on position of the charged area along as well as across channel length.Maximal changes of the drain current occurs at position of the charged area in the center of the interface plane. Such behavior of the drain current corresponds to potential distribution in the channel of considered MOSFET (Fig. 5).

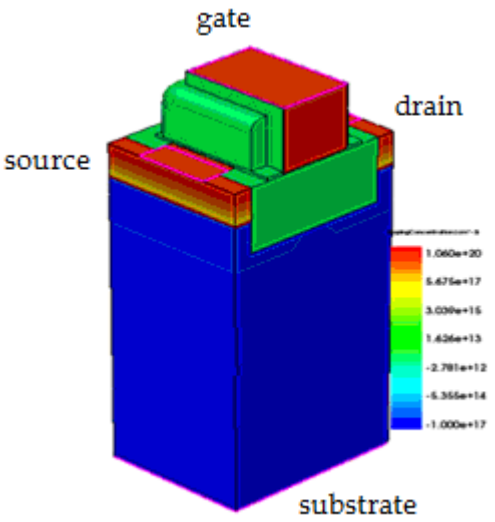

Fig1.Simulated MOSFET structure

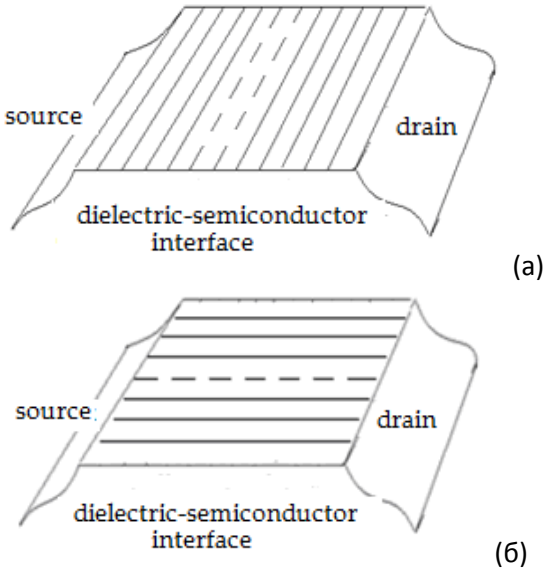

Fig 2. Interface surface virtually is divided by cross (a) and longitudinal (b) rectangular areas relatively length of the channel

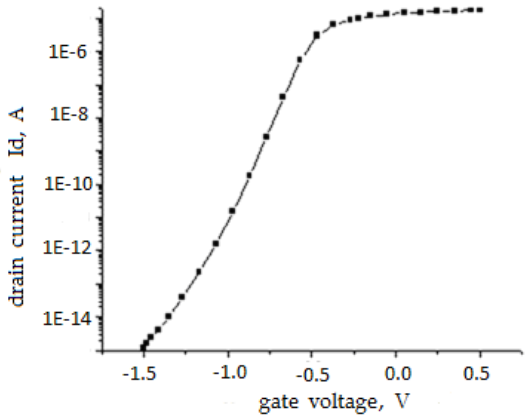

Fig 3.Typical Id-Vg characteristic considered MOSFET at 50 mV on the source.

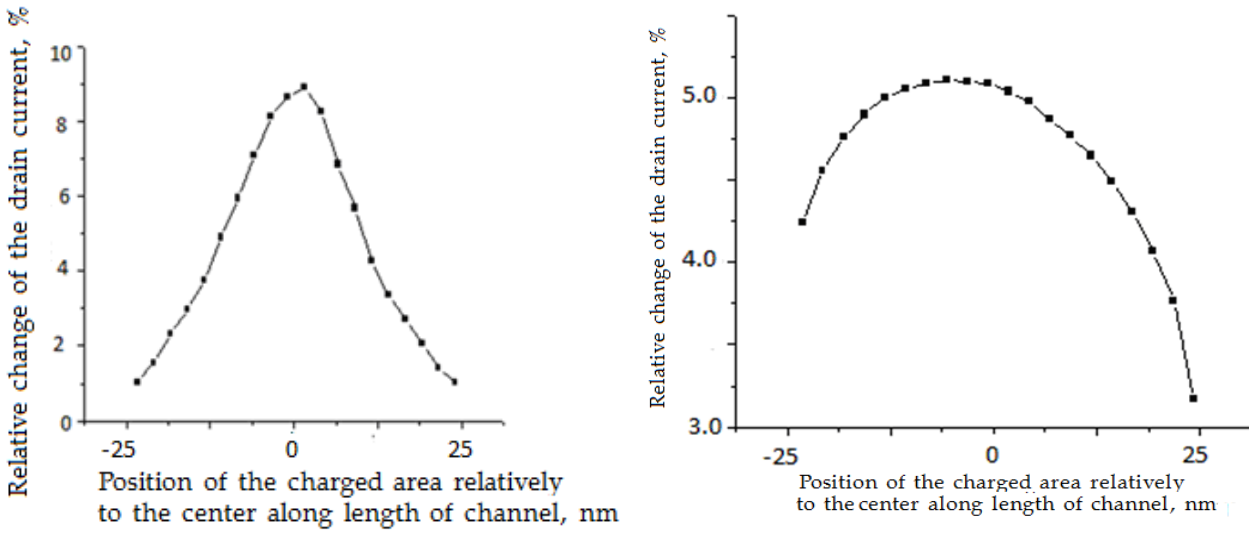

Fig 4. Changing of the drain current at different position of interface trapped charge.

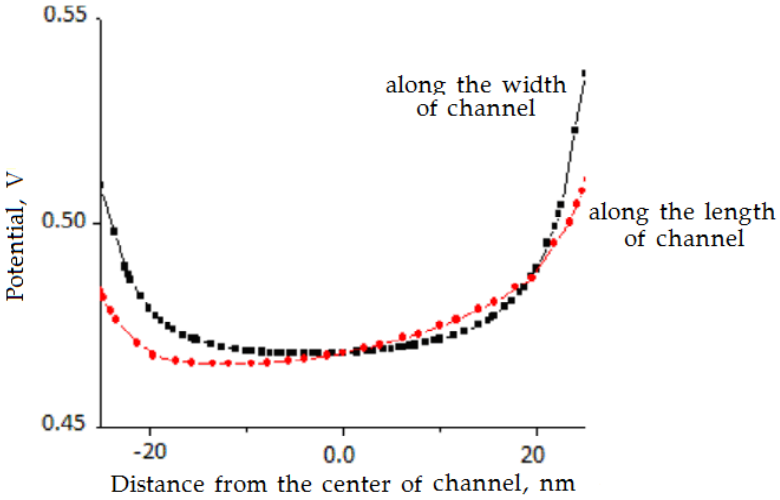

Fig 5. Longitudinal and cross potential distribution relatively to the channel length on substrate depth of 6 nm from the interface.

Conclusion

In conclusion it can be noted (a) the drain current has dependence on position of the charged area along as well as across channel length, (b) maximal changes of the drain current occurs at position of the charged area in the center of the interface plane. Besides it there is defined symmetry relatively to the center of interface plane in changing of the drain current. The drain current changing induced by localization of the interface charge is varied in the range 2-10% depending on position of the charged area.

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UDC: 519.712.3

THE PROBLEMS OF SOLVING SOME TASKS OF COMBINATORICS ON COMPUTER

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Abstract. Actually, there would be problems in solving some tasks of combinatorics depending on computer memory and speed. It's required the separate approach of tasks solving to solve such problems. The given article is devoted to solving such problems.

Annotatsiya. Odatda, kombinatorika masalalarini kompyuterda yechishda kompyuter xotirasi yoki tezligi bilan bog'liq muammolar paydo bo'ladi. Bu esa o'z navbatida, masalani yechishning maxsus yo'lini talab qiladi. Maqola ana shunday muammolarni yechishga bag'ishlanadi.

Аннотация. Обычно, при решении задачи комбинаторики на компьютере появятся вопросыв зависимости от памяти или скорости компьютера. Чтобы решить эти проблемы требуется специальный подход решения задачи. Настоящая статья посвящается решению такого вопроса.

Keywords: Combinations, recursive formula, algorithm.

Kalitso'zlar: Kombinatsiyalar, recursive formula, algoritm.

Ключевые слова: Комбинации, рекурсивная формула, алгоритм.

Introduction

Transformation of programming from small intelectual branch to industrial sphere in the current society requires studying some aspects of fundamental contemporary computer science. The modern computer science at high and secondary special education consists of the following two parts:

1) Algorithm and Programming
2) Office and Net technology

Studying algorithm and programming is not only for obtaining some experience, but also it is effective for the development of operating and intelligence system's environment. Thus, this article is dedicated to learn a problem of algorithm within the tasks of Combinatorics.

It is known that, the area of Combinatorics closely connected with Algebra, Discrete Mathematics, Graph Theory, Probability Theory, Functional analysis and etc. Solving the tasks of Combinatorics on a computer usually causes problems, which depend on a memory or on a speed. It requires special way of task solution. In this turn, we are going to count the main novelty of this article:

1) *f(K,N)*- recursive formula is taken, which is the number of sum expressions of *N,* where summands are no more than *K* (*N*> *K* ; *N, K*- natural numbers)

$$f(K,N)=f(K,N-1)+f(K,N-2)+...+f(K,N-K)$$

2) Table method is solved for *f(K,N)*- recursive formula.

Main part

The main task of this article is to find recursive *f(K,N)* - formula, which is the number of the sum expressions of N where summands are no more than *K* (*N*> *K* ; *N, K*- natural numbers).

To solve this problem, we bring the following theorem as it is the main result of this article: Let *f(K,N)*- the number of the sum expressions of *N,* where summands are no more than *K*(*N*> *K* ; *N, K* - natural numbers).

Theorem: For the f (K, N) the following

$$f(K,N)=f(K,N-1)+f(K,N-2)+...+f(K,N-K) \text{ equation is true} \quad (1)$$

(Comment: It is considered as different expressions, if the position of summands changes in the sum);

Proof: Let's consider the group of the sum expressions as overall sum is equal to N and the last summand to 1. If 1 is subtracted from this group, the sum of the rest summands is equal to N-1, or vice versa, we get the group of the sum expressions of N with adding 1 to the sum expressions of N-1. Here, different combinations of sum expressions of N are taken by sum expressions of the *N-1* with adding 1 to the end, which summands are no more than *K*.

Therefore, the number of all combinations of expressions of the group, which overall sum is equal to N and the last summand is 1, is equal to *f(K,N-1).* Let's say this group of sum expressions, as the first group.

With the same way we can show the number of all combinations of expressions of the group, which overall sum is equal to N and the last summand is 2, is equal to *f (K, N-2)*. Let's say the group of the sum expressions where overall sum is equal to N and the last summand is 2, as the second group, and etc. By continuing this expression, the number of all combinations of expressions of the group is found, which overall sum is equal to N and the last summand is *K,* is equal to *f (K, N-K)*. Let's say this group of sum expressions, as the *K* –group. Therefore, each combination of the sum expressions of *N* belongs to some group of

the groups above, or the sum expression of any groups is some combination of sum expressions of *N*. According to the addition rule of Combinatorics, it means:
F (K, N) = f(K,N-1)+f(K,N-2)+...+f(K,N-K).

The theorem is proved.

Let's suppose that, *N*=5,*K*=3. We are to find the number of sum expressions of 5, which summands are no more then 3. In this case, we seperate the following three groups of sum expresions of 5:

1-group		**2-group**		**3-group**	
1+1+1+1	+1;	2+1	+2;	1+1	+3;
2+1+1	+1;	1+2	+2;	2	+3;
1+2+1	+1;	3	+2;		
1+1+2	+1;				
2+2	+1;				
1+3	+1;				
3+1	+1;				

The number of sum expressions of 5 for the first group is *f*(3,4), the number of sum expressions of 5 for the second group is *f*(3,3) and the number of sum expressions of 5 for the third group is *f*(3,2). The number of sum expressions of 5 for the total groups is

f(3,5)=*f*(3,4)+*f*(3,3)+*f*(3,2).

The table method for *f(K,N)*

Let's suppose, to construct tabel view of *f(K,N) is required*. In order to complete this, the theorem is given below:
Theorem: The number of the sum expressions of N, which summands are no more than N(N - natural number) is equal to 2^{N-1} *[1,104 page].*

Following result is taken from the theorem:

Result: If K is not less than N (K≥N), the number of the sum expressions of N, which summands are no more than K, is equal to 2^{N-1} .

Proof: The proof of this theorem if very simple. In the case $K \geq N$, the result is equal *to* 2^{N-1} . Because, *t*he number of the sum expressions of *N*, which summands are more than *N* is equal to zero. (For example, the number of sum expressions of 5, which summands are no more than 8, is equal to $2^{5-1}=16$. In order to get 5, the numbers 6,7,8 are not take part in the sum expressions). The result is proved.

In order to construct the tabel method of *f(K,N*), considering all above mentioned opinions, the following formula is taken:

$$f(K,N)=\begin{cases} 1, & if\ N=1\ \ then, \\ 2^{N-1}, & if\ \ N \le K\ \ then \\ f(K,N)=f(K,N-1)+f(K,N-2)+...+f(K,N-K) & \text{otherwise} \end{cases}$$

To illustrate, filling of *K* row of the table is is considered. In the case of $K<N(1<K<N)f(K,1); f(K,2); f(K,3);...f(K,K)$ elements of the tabel are equal to 2^0 ; 2^1; 2^2 ; 2^3 ; ...;2^{K-1} respectively. Each element of the rest part of the row is equal to the sum of consecutive *K* elements, which are coming just before *K*. As a result, the following tabel is constructed:

Conclusion

Recursive formula (1), which is the main result of the article, is not only to create a program for the given task, but also has a great significance on producing programs for the similar types of tasks. It is possible to program the task by means of (1) formula, for N=200,K=195 and the result is 80346902212949513777098104617058130126110149689139641765064O. It is not complicated to observe that, programming the task without formula (1) has huge complexity.

K\N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	1	2	3	5	8	13	21	34	55	89	144	233	377	610	987
3	1	2	4	7	13	24	44	81	149	274	504	927	1705	3136	5768
4	1	2	4	8	15	29	56	108	208	401	773	1490	2872	5536	10671
5	1	2	4	8	16	31	61	120	236	464	912	1793	3525	6930	13624
6	1	2	4	8	16	32	63	125	248	492	976	1936	3840	7617	15109
7	1	2	4	8	16	32	64	127	253	504	1004	2000	3984	7936	15808

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UDC: 517.958

MULTI-SOLITON SOLUTIONS OF THE MATRIX KORTEWEG-DE VRIES EQUATION WITH SELF-CONSISTENT SOURCE

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Abstract. In this paper we propose a method for finding multi-soliton solutions of the matrix Korteweg-de Vries equation with a self-consistent source.

Аннотация. Бу мақолада мосланган манбали матрицавий Кортевег-де Фриз тенгламасининг кўпсолитонли ечимларини топиш усули келтирилган.

Аннотация. В данной работе предлагается метод для нахождения многосолитонных решений матричного уравнения Кортевега-де Фриза с самосогласованным источником.

Keywords. Matrix Korteweg-de Vries equation, Inverse scattering method, matrix Sturm-Liouville operator.

Калит сўзлар: Кортевег-де Фриз матрицали тенгламаси, матрица.**Ключевые слова:** Матричное уравнения Кортевега-де Фриза, матрица.

Introduction

There is a great class of potentials for which both direct and inverse scattering problems are solved exactly. These potentials are called reflectionless potentials and for them the reflection coefficient is identically zero. This class of potentials is related to a family of exact solutions of nonlinear evolution equations - the so-called multi-soliton solutions. These solutions describe the collision of solitons. A remarkable feature of these equations is the lack of effects of inelastic collisions of solitons - after the collision solitons appear the same as before the collision. This fact has resulted in a great interest in these equations. A great interest in soliton equation withself-consistent sources arouse in recent years. Physically, the source appears in thesolitonwave with variablespeeds andleads to a dynamically differen tphysical models. The application of these types are commonly used in describing interaction between the soliton waves and some problems related to hydrodynamics, physics, solidorplasma physics [1-5].

Matrix Korteweg-de Vries equation

$$U_t - 3UU_x - 3U_xU + U_{xxx} = 0,$$

where $U = U(x,t)$ a $d \times d$ sized square matrix was first introduced by P.D.Lax [6].

In this paper we consider the following problem

$$\begin{cases} U_t - 3UU_x - 3U_xU + U_{xxx} = 2\sum_{n=1}^{N} \frac{\partial}{\partial x}(\varphi_n \otimes \varphi_n^T), \\ -\varphi_n'' + U\varphi_n = \lambda_n \varphi_n, \qquad n = 1, 2, \ldots, N, \end{cases} \quad (1)$$

where $U=\left(u_{jk}(x,t)\right)_{j,k=1}^{d}$ a real $d\times d$ sized symmetric matrix, $\varphi_n=\varphi_n(x,t)=(\varphi_{n1}(x,t),\varphi_{n2}(x,t),...,\varphi_{nd}(x,t))^T$, $n=1,2,...,N$ real eigenvectors of the

$$L(t)=-D^2+U(x,t),\ D=\frac{d}{dx},\ x\in R,$$

matrix Sturm-Liouville operator corresponding to eigenvalues $\lambda_n=-\chi_n^2$, $n=1,2,...,N$ and they are normalized by the following conditions

$$\int_{-\infty}^{\infty}\varphi_n^T(x,t)\varphi_n(x,t)dx=a_n^2(t),\ n=1,2,...,N, \tag{2}$$

where $a_n(t),\ n=1,2,...,N$ given continuous scalar functions.

The problem (1), (2) is considered with an initial condition

$$U\big|_{t=0}=U_0(x), \tag{3}$$

where the initialmatrix function $U_0(x)$ has the following properties:

1. $\int_{-\infty}^{\infty}(1+x^2)\|U_0(x)\|dx<\infty$, where $\|X\|=\max_j\sum_{k=1}^{d}|x_{jk}|,\ X=(x_{jk})_{j,k=1}^{d}$;

2. The operator $L(0)=-D^2+U_0(x)$ has exactly N eigenvalues $\lambda_1(0),\lambda_2(0),...,\lambda_N(0)$.

We assume that the solution $U(x,t)$ of problem (1) - (3) exists, is sufficiently smooth and it tends to its limits sufficiently rapidly when $x\to\pm\infty$, so that for all $t\geq 0$ the following condition holds:

$$\int_{-\infty}^{\infty}(1+x^2)\|U(x,t)\|dx<\infty. \tag{4}$$

We consider following the matrix Sturm-Liouville equation on the whole line

$$L\psi\equiv-\psi''+U(x)\psi=\lambda\psi,\ \lambda=k^2,\ (-\infty<x<\infty), \tag{5}$$

where $\psi=\psi(x,k)$ a $d\times d$ sized matrix-function (see. [7.8]). Potential $U(x)$ is assumed to be a real symmetric matrix of size $d\times d$,which tends to its limits fairly quickly, so that

$$\int_{-\infty}^{\infty}(1+x^2)\|U(x)\|dx<\infty. \tag{6}$$

We have the following proposition.

Proposition 1. Let the matrix functions $X(x,\lambda)$ and $Y(x,\mu)$ are solutions of the $LX=\lambda X$ and $LY=\mu Y$ equations, respectively. Then we have the following identity

$$(\mu-\lambda)Y^TX=\frac{d}{dx}W\{Y^T,X\},$$

where $W\{Y^T,X\}\equiv Y^TX'-Y'^TX$.

Solutions $F(x,k)$ and $G(x,k)$ $(k\in R)$ of equation (5) with the asymptotic behavior

$$F(x,k)=e^{ikx}(I+o(1)),\quad x\to+\infty,\quad G(x,k)=e^{-ikx}(I+o(1)),\quad x\to-\infty \tag{7}$$

is called Jost solution. Under the conditions (6), Jost solutions exist and are unique. For real k, functions $F(x,-k)$ and $G(x,-k)$ are also solutions of the equation (5). At $\operatorname{Im}k=0$ the following expansions hold

$$G(x,k)=F(x,-k)A(k)+F(x,k)B(k),\quad F(x,k)=G(x,-k)C(k)+G(x,k)D(k), \tag{8}$$

where $A(k)$, $B(k)$, $C(k)$, $D(k)$ some $d\times d$ sizematrix.

Matrix function $A(k)$ can be analytically continued into the $\operatorname{Im}k>0$ upper half-plane, and the equation $\det A(k)=0$ has a finite number of zeros, say $k_j=i\chi_j$, $j=1,2,...,N$. The numbers $\lambda_j=-\chi_j^2$, $j=1,2,...,N$ coincide with the eigen values of the operator L.

We also use following proposition.

Proposition 2. Let a, b, c, d be n dimension column and A be $(n\times n)$ square matrix, then hold the following equalities:

$$1)\ a^T(b\otimes c^T)d=(a^Tb)(c^Td),\ 2)\ A(a\otimes b^T)=(Aa)\otimes b^T,$$

$$3)\ a\otimes(b^TA)=(a\otimes b^T)A.$$

Evolution ofthe spectral data

Let

$$B=-4D^3+3UD+3DU$$

then the first equation of (1) can be rewritten as theoperator relation

$$\dot{L}=[B,L]+2\sum_{n=1}^{N}(\varphi_n\otimes\varphi_n^T)'. \tag{11}$$

Proposition 3. The following equalities hold

$$\frac{d\lambda_k}{dt}=0,\ k=1,2,...,N. \tag{12}$$

Proof. Let $Y_k=Y_k(x,t)$ be normalized eigen vector of $L(t)$ corresponding to the eigen value λ_k,i.e.

$$LY_k=\lambda_kY_k,(Y_k,Y_k)=\int_{-\infty}^{\infty}Y_k^T(x,t)Y_k(x,t)dx=1.$$

After differentiating $LY_k=\lambda_kY_k$ by *t* we obtain

$$\dot{L}Y_k+L\dot{Y}_k=\dot{\lambda}_kY_k+\lambda_k\dot{Y}_k.$$

Multiplying this equality by Y_k scalarly, taking $(Y_k,Y_k)=1$ and symmetry of operator L into account, we find that

$$\frac{d\lambda_k}{dt}=\int_{-\infty}^{\infty}Y_k^T\dot{L}Y_kdx. \tag{13}$$

Substituting the expression (11) to equation (13) we deduce

$$\frac{d\lambda_k}{dt}=\int_{-\infty}^{\infty}Y_k^T[B,L]Y_kdx+\int_{-\infty}^{\infty}Y_k^T\left\{2\sum_{n=1}^{N}(\varphi_n\otimes\varphi_n^T)'\right\}Y_kdx=$$

$$= \int_{-\infty}^{\infty} Y_k^T BLY_k dx - \int_{-\infty}^{\infty} Y_k^T LBY_k dx + 2\sum_{n=1}^{N} \int_{-\infty}^{\infty} Y_k^T (\varphi_n \otimes \varphi_n^T)' Y_k dx .$$

Using the equality $LY_k = \lambda_k Y_k$ and the symmetry of the operator L, we get out of here

$$\frac{d\lambda_k}{dt} = 2\sum_{n=1}^{N} \int_{-\infty}^{\infty} Y_k^T (\varphi_n' \otimes \varphi_n^T + \varphi_n \otimes (\varphi_n^T)') Y_k dx . \quad (14)$$

We compute the following integral

$$J_n = 2\int_{-\infty}^{\infty} Y_k^T (\varphi_n' \otimes \varphi_n^T + \varphi_n \otimes (\varphi_n^T)') Y_k dx .$$

Using proposition2, it is easy to see that

$$J_n = 2\int_{-\infty}^{\infty} [Y_k^T (\varphi_n' \otimes \varphi_n^T) Y_k + Y_k^T (\varphi_n \otimes (\varphi_n^T)') Y_k] dx =$$

$$= \int_{-\infty}^{\infty} \{[Y_k^T \varphi_n' - (Y_k^T)' \varphi_n](\varphi_n^T Y_k) + (Y_k^T \varphi_n)[(\varphi_n^T)' Y_k - \varphi_n^T Y']\} dx + \int_{-\infty}^{\infty} [(Y_k^T \varphi_n)(\varphi_n^T Y_k)]' dx =$$

$$= \int_{-\infty}^{\infty} [W\{Y_k^T, \varphi_n\} \varphi_n^T Y_k - Y_k^T \varphi_n W\{\varphi_n^T, Y_k\}] dx .$$

If $n \neq k$, then by proposition 1 we have

$$J_n = \frac{1}{\lambda_n - \lambda_k} \int_{-\infty}^{\infty} [W\{Y_k^T, \varphi_n\} \cdot \frac{d}{dx} W\{\varphi_n^T, Y_k\} + \frac{d}{dx} W\{Y_k^T, \varphi_n\} \cdot W\{\varphi_n^T, Y_k\}] dx =$$

$$= \frac{1}{\lambda_n - \lambda_k} \int_{-\infty}^{\infty} \frac{d}{dx} \left(W\{Y_k^T, \varphi_n\} W\{\varphi_n^T, Y_k\} \right) dx = 0 .$$

If $n = k$, then $W\{Y_k^T, \varphi_k\} = 0$ and $W\{\varphi_k^T, Y_k\} = 0$, therefore $J_n = 0$.

So, $J_n = 0$, $n = 1, 2, ..., N$. Substituting this into (14) we deduce the equality (12).

Proposition 4. Let $F_0(x,k,t)$ be any matrixsolution of the equation

$$LY = k^2 Y . \quad (15)$$

Then the following function

$$H_0 = \dot{F}_0 - BF_0 - \sum_{n=1}^{N} \varphi_n \otimes F_n \quad (16)$$

is also a solution of equation (15). Here $F_n(x,k,t)$, $n = 1,2,...,N$ any vector-rows satisfying equations

$$\frac{\partial F_n}{\partial x} = \varphi_n^T F_0, \quad n = 1,2,...,N . \quad (17)$$

Proof. We introduce the vector-rows the following form

$$H_n = \varphi_n^T F_0' - \varphi_n'^T F_0 + (k^2 - \lambda_n) F_n, \quad n = 1,2,...,N . \quad (18)$$

Using Lemma1, it is easy to see that

$$\frac{\partial H_n}{\partial x} = \frac{\partial}{\partial x} W\{\varphi_n^T, F_0\} + (k^2 - \lambda_n) \frac{\partial F_n}{\partial x} = (\lambda_n - k^2) \varphi_n^T F_0 + (k^2 - \lambda_n) \varphi_n^T F_0 = 0 .$$

It follows that $H_n(x,k,t)$ functions does not depend on x. Calculating the limit of the function $H_n(x,k,t)$ when $x \to +\infty$ (or when $x \to -\infty$) we obtain

$$H_n \equiv 0,\ n = 1,2,...,N. \tag{19}$$

Now we calculate LH_0. From the expression (16) we find

$$LH_0 = L\dot{F}_0 - LBF_0 - \sum_{n=1}^{N} L(\varphi_n \otimes F_n). \tag{20}$$

Differentiating the identity $LF_0 = k^2 F_0$ by t, we find that

$$\dot{L}F_0 + L\dot{F}_0 = k^2 \dot{F}_0.$$

Using equation (11), we deduce from this

$$L\dot{F}_0 = k^2\dot{F}_0 - \dot{L}F_0 = k^2\dot{F}_0 - k^2BF_0 + LBF_0 - 2\sum_{n=1}^{N}(\varphi_n' \otimes \varphi_n^T)F_0 - 2\sum_{n=1}^{N}(\varphi_n \otimes \varphi_n'^T)F_0.$$

Substituting this expressionin (20) we have

$$LH_0 = k^2\dot{F}_0 - k^2BF_0 - 2\sum_{n=1}^{N}(\varphi_n' \otimes \varphi_n^T)F_0 - 2\sum_{n=1}^{N}(\varphi_n \otimes \varphi_n'^T)F_0 - \sum_{n=1}^{N} L(\varphi_n \otimes F_n). \tag{21}$$

Hence we find that

$$LH_0 - k^2H_0 = \sum_{n=1}^{N}\left\{-2(\varphi_n' \otimes \varphi_n^T)F_0 - 2(\varphi_n \otimes \varphi_n'^T)F_0 + k^2\varphi_n \otimes F_n - L(\varphi_n \otimes F_n)\right\}. \tag{22}$$

Using an explicit expression forthe operator L we get

$$L(\varphi_n \otimes F_n) = \lambda_n\varphi_n \otimes F_n - 2\varphi_n' \otimes (\varphi_n^T F_0) - \varphi_n \otimes (\varphi_n'^T F_0) - \varphi_n \otimes (\varphi_n^T F_0').$$

Substituting this expression into (22), taking into account proposition2, we obtain

$$LH_0 - k^2H_0 = \sum_{n=1}^{N}\varphi_n \otimes H_n. \tag{23}$$

In respect that equality(19), from (23) we deduce $(L - k^2)H_0 = 0$.

Corollary 1. If the decision $F_0(x,k,t)$ in Proposition4 to take decisions Jost solutions $F(x,k,t)$ and $G(x,k,t)$, then, by these two decisions we can take the following newsolutions

$$H_0^+(x,k,t) = \dot{F} - BF - \sum_{n=1}^{N}\varphi_n \otimes F_n^+, \tag{24}$$

$$H_0^-(x,k,t) = \dot{G} - BG - \sum_{n=1}^{N}\varphi_n \otimes F_n^-, \tag{25}$$

where

$$F_n^+(x,k,t) = -\int_x^{\infty}\varphi_n^T(x,t)F(x,k,t)dx, \tag{26}$$

$$F_n^-(x,k,t) = \int_{-\infty}^{x}\varphi_n^T(x,t)G(x,k,t)dx. \tag{27}$$

Note1. Using the asymptotic behavior

$$F(x,k,t) = e^{ikx}(I + o(1)),\ x \to +\infty, \qquad G(x,k,t) = e^{-ikx}(I + o(1)),\ x \to -\infty,$$

from (24), (25) and equality $B = -4D^3 + 3UD + 3DU$ we have

$$H_0^+(x,k,t) \to -4ik^3e^{ikx}(I + o(1)),\ x \to +\infty,$$

$$H_0^-(x,k,t) \to 4ik^3e^{-ikx}(I + o(1)),\ x \to -\infty.$$

Because of the uniqueness of Jost solutions we obtain

$$H_0^+(x,k,t) = -4ik^3F(x,k,t), \tag{28}$$

$$H_0^-(x,k,t) = 4ik^3G(x,k,t). \tag{29}$$

Proposition 6. Matrix functions $R_j(t)$, $j=1,2,...,N$ satisfy the following differential equations

$$\frac{dR_j}{dt} = \left(8\chi_j^3 + a_j^2(t)\right)R_j, \ j=1,2,...,N, \tag{40}$$

where $a_j^2(t)$ given continuous scalar functions defined by (2).

Proof. We know that

$$\varphi_j(x,t) = F(x,i\chi_j,t)\cdot c_j(t), \ j=1,2,...,N, \tag{41}$$

where $c_j(t)$, $j=1,2,...,N$ nonzero columns. According to equation (2) we find

$$c_j^T(t)\cdot\int_{-\infty}^{\infty}F^T(x,i\chi_j,t)F(x,i\chi_j,t)dx\cdot c_j(t) = a_j^2(t), \ j=1,2,...,N. \tag{42}$$

Using the equality

$$2ikC(k,t) = W\left\{G^T(x,k,t),F(x,k,t)\right\},$$

we have

$$2ik_jC(k_j,t)\cdot c_j(t) = W\left\{G^T(x,k_j,t),F(x,k_j,t)\right\}\cdot c_j(t) =$$

$$= W\left\{G^T(x,k_j,t),F(x,k_j,t)\cdot c_j(t)\right\} = W\left\{G^T(x,k_j,t),\varphi_j(x,t)\right\} = 0,$$

i.e

$$C(k_j,t)c_j(t) = 0, \ j=1,2,...,N. \tag{43}$$

We introduce the notation

$$H_j = H_0^-(x,k_j,t)N_j - iH_0^+(x,k_j,t)R_j(t), \ \ j=1,2,...,N. \tag{44}$$

Substituting the expression (24) and (25) we have

$$H_j = \left\{\dot{G}(x,k_j,t) - BG(x,k_j,t) - \sum_{n=1}^{N}\varphi_n\otimes F_n^-(x,k_j,t)\right\}N_j -$$

$$-i\left\{\dot{F}(x,k_j,t) - BF(x,k_j,t) - \sum_{n=1}^{N}\varphi_n\otimes F_n^+(x,k_j,t)\right\}R_j(t) =$$

$$= \dot{G}(x,k_j,t)N_j - BG(x,k_j,t)N_j - i\dot{F}(x,k_j,t)R_j(t) + iBF(x,k_j,t)R_j(t) +$$

$$+\sum_{n=1}^{N}\varphi_n\otimes\{iF_n^+(x,k_j,t)R_j(t) - F_n^-(x,k_j,t)N_j\}. \tag{45}$$

Since the matrix N_j are independent of t from equality $G(x,k_j,t)N_j = iF(x,k_j,t)R_j(t)$ we obtain

$$\dot{G}(x,k_j,t)N_j = i\dot{F}(x,k_j,t)R_j(t) + iF(x,k_j,t)\dot{R}_j(t). \tag{46}$$

Using (26) and (27) we find

$$iF_n^+(x,k_j,t)R_j(t) - F_n^-(x,k_j,t)N_j = -\int_x^{\infty}\varphi_n^T(x,t)iF(x,k_j,t)R_j(t)dx -$$

$$-\int_{-\infty}^{x}\varphi_n^T(x,t)G(x,k_j,t)N_jdx = -\int_x^{\infty}\varphi_n^T(x,t)iF(x,k_j,t)R_j(t)dx -$$

$$-\int_{-\infty}^{x}\varphi_n^T(x,t)iF(x,k_j,t)R_j(t)dx=-i\left\{\int_{-\infty}^{\infty}\varphi_n^T(x,t)F(x,k_j,t)dx\right\}R_j(t). \quad (47)$$

Substituting expressions (46) and (47) inequation (45) we obtain

$$H_j=iF(x,k_j,t)\dot{R}_j(t)-i\sum_{n=1}^{N}\varphi_n(x,t)\otimes\left\{\int_{-\infty}^{\infty}\varphi_n^T(x,t)F(x,k_j,t)dx\right\}R_j(t). \quad (48)$$

When $n\neq j$, according to Proposition1, we have

$$\varphi_n^T(x,t)F(x,k_j,t)=\frac{1}{k_j^2-\lambda_n}\cdot\frac{\partial}{\partial x}W\{\varphi_n^T(x,t),F(x,k_j,t)\},$$

it follows that

$$\int_{-\infty}^{\infty}\varphi_n^T(x,t)F(x,k_j,t)dx=0\text{, when } n\neq j.$$

Therefore, equality (48) can be rewritten as

$$H_j=iF(x,k_j,t)\dot{R}_j(t)-i\varphi_j(x,t)\otimes\left\{\int_{-\infty}^{\infty}\varphi_j^T(x,t)F(x,k_j,t)dx\right\}R_j(t). \quad (49)$$

According to (41) we find

$$\varphi_j(x,t)\otimes\int_{-\infty}^{\infty}\varphi_j^T(x,t)F(x,k_j,t)dx=F(x,k_j,t)c_j(t)\otimes c_j^T(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dx. \quad (50)$$

We introduce the notation

$$P_j(t)=c_j(t)\otimes c_j^T(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dx. \quad (51)$$

Then (49) takes the form

$$H_j=iF(x,k_j,t)\dot{R}_j(t)-iF(x,k_j,t)P_j(t)R_j(t). \quad (52)$$

Using equation (42), we calculate the $P_j^2(t)$:

$$P_j^2(t)=c_j(t)\otimes\left\{c_j^T(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dx\cdot c_j(t)\right\}\otimes c_j^T(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dx=$$

$$=a_j^2(t)c_j(t)\otimes c_j^T(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dx=a_j^2(t)P_j(t). \quad (53)$$

Furthermore, from (43) it follows that

$$C(k_j,t)P_j=\{C(k_j,t)c_j(t)\}\otimes c_j^T(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dx=0. \quad (54)$$

In [20] was obtained the following equation

$$R_j(t)=P_j(t)\left(P_j(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dxP_j(t)+(I-P_j(t))\right)^{-1}. \quad (55)$$

Hence, by virtue of (53) we have

$$P_j(t)R_j(t)=P_j^2(t)\left(P_j(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dxP_j(t)+(I-P_j(t))\right)^{-1}=$$

$$=a_j^2(t)P_j(t)\left(P_j(t)\int_{-\infty}^{\infty}F^T(x,k_j,t)F(x,k_j,t)dxP_j(t)+(I-P_j(t))\right)^{-1}=a_j^2(t)R_j(t),$$

i.e.

$$P_j(t)R_j(t) = a_j^2(t)R_j(t). \tag{56}$$

Substituting (56) into (52) we find

$$H_j = iF(x,k_j,t)\dot{R}_j(t) - ia_j^2(t)F(x,k_j,t)R_j(t)$$

i.e.

$$H_j = F(x,k_j,t)\{i\dot{R}_j(t) - ia_j^2(t)R_j(t)\}. \tag{57}$$

According to (28) and (29) we have

$$H_0^+(x,k_j,t) = -4\chi_j^3 F(x,k_j,t), \qquad H_0^-(x,k_j,t) = 4\chi_j^3 G(x,k_j,t).$$

Substituting these expressions into (44) we conclude that

$$H_j = H_0^-(x,k_j,t)N_j - iH_0^+(x,k_j,t)R_j(t) = 4\chi_j^3 G(x,k_j,t)N_j + 4i\chi_j^3 F(x,k_j,t)R_j(t),$$

i.e

$$H_j = 8i\chi_j^3 F(x,k_j,t)R_j(t). \tag{58}$$

Equating (57) and (58) we obtain

$$\dot{R}_j(t) = \{8\chi_j^3 + a_j^2(t)\}R_j(t),\ j = 1,2,...,N. \tag{59}$$

This is the equation (40).

We introduce the matrix $N_j = \underset{k=k_j}{res}(A(k))^{-1}$, $j = 1,2,...,N$, then there exist matrices R_j, $j = 1,2,...,N$ such that

$$G(x,k_j)N_j = iF(x,k_j)R_j,\ j = 1,2,...,N. \tag{9}$$

The following matrix

$$R(k) = B(k)(A(k))^{-1},\ \operatorname{Im} k = 0, \tag{10}$$

is called the scattering matrix, and set $\{R(k), \chi_1, \chi_2, ..., \chi_N, R_1, R_2, ..., R_N\}$ is called the scattering data for the equation(5).

To solve the inverse problem of recovering the operator L from the scattering dataset

$$H(x) = \sum_{j=1}^{n} R_j e^{ik_j x} + \frac{1}{2\pi}\int_x^{+\infty} R(k)e^{ikx}dk.$$

Potential of the operator L is found by formula

$$U(x) = -2K'(x), \tag{11}$$

where $K(x) = K(x,x)$, and $K(x,y)$ is the solution of the following matrix Gelfand-Levitan-Marchenko equation

$$K(x,y) + H(x+y) + \int_x^{+\infty} K(x,z)H(y+z)dz = 0. \tag{12}$$

The following theorem holds.

Theorem 1. If $U(x,t)$, $\varphi_n(x,t)$, $j = 1,2,...,N$ are the solution ofthe problem (1)-(5), then the scattering data of matrix Sturm-Liouville operator $L(t) = -D^2 + U(x,t)$, $x \in R^1$ satisfies the following equations

$$\frac{\partial R(k,t)}{\partial t} = 8ik^3 R(k,t),\ \operatorname{Im} k = 0, \frac{d\chi_j(t)}{dt} = 0,$$

$$\frac{dR_j(t)}{dt} = \left(8\chi_j^3 + a_j^2(t)\right)R_j(t),\ j = 1,2,...,N.$$

Now consider the case reflectionless potentials: $R(k) \equiv 0$. In this case, the equation of Gelfand-Levitan Marchenko solved explicitly. Assume that all $k_j:\ A(k_j) = 0$ located on the imaginary axis, so that $k_j = i\lambda_j,\ 0 < \lambda_1 < ... < \lambda_N$. The equation (8)can be rewritten as

$$K(x,y) + \sum_{j=1}^{n} R_j e^{-\lambda_j(x+y)} + \sum_{j=1}^{n} \int_x^{+\infty} K(x,z) R_j e^{-\lambda_j(y+z)} dz = 0.$$

Assuming that $K(x,y)$ looks $K(x,y) = \sum_{j=1}^{n} K_j(x) e^{-\lambda_j y}$, integrating and sharing terms with $e^{-\lambda_j y}$, $j = 1,2,...,N$ we obtain the following system of linear equations:

$$\sum_{j=1}^{n} K_j A_{ij} = -R_j e^{-\lambda_j x},\ A_{ij} = \delta_{ij} I + \frac{R_j}{\lambda_i + \lambda_j} e^{-(\lambda_i + \lambda_j)x},\ i, j = 1,...,N. \qquad (13)$$

In order to write an explicit formula for $K(x)$, we use the concept quasi determinant entered by Gelfand and Retakh [9].

Let $R = Mat_d(C)$ represent $(d \times d)$ matrix algebra and $X - (n \times n)$ matrix over R. For any $1 \le i, j \le n$ by $r_i(X)$ we denote $i-$th row and by $c_j(X) - j-$th column of X. Let X^{ij} be a sub matrix of X obtained by removing the *i*-throw and *j*-th column X. For the vector-row r let $r^{(j)}$ be r without the *j*-th element. For a column vector *c* let $c^{(i)}$ be c without the *i*-the lement.Then, by definition quasi determinant,

$$|X|_{ij} = x_{ij} - r_i(X)^{(j)} (X^{ij})^{-1} c_j(X)^{(i)},$$

where $x_{ij} - ij-$the lement of the matrix X. It is easy to check that if $d = 1$ then

$$|X|_{ij} = (-1)^{(i+j)} \frac{\det X}{\det X^{ij}}.$$

We denote by $A\ (n \times n)$ sized matrix, whose *ij*-th entry is a $(d \times d)$ sized matrix A_{ij}. Then it is easy to verify that

$$K(x) = \sum_{j=1}^{n} \left|A^{(j)}\right|_{jj} |A|_{jj}^{-1}, \qquad (14)$$

where $A^{(j)}$ is obtained from differentiation *j*-th row of the matrix A, and $|A|_{jj} - jj$-th quasi determinant of the matrix*A*.

Thus, we arrive at the following theorem.

Theorem 2. The matrix Korteweg-de Vries equation with a self-consistent source has multisoliton solutions the following form

$$U(x,t) = -2\left(\sum_{j=1}^{n} \left|A^{(j)}\right|_{jj} |A|_{jj}^{-1}\right)'$$

where A_{ij} elementsof *A*are determined by theformula

$$\sum_{j=1}^{n} K_j A_{ij} = -R_j e^{-\lambda_j x},\ A_{ij} = \delta_{ij} I + \frac{R_j}{\lambda_i + \lambda_j} e^{-(\lambda_i + \lambda_j)x},\ i, j = 1, \ldots, N.$$

Here

$$\frac{dR_j(t)}{dt} = \left(8\chi_j^3 + a_j^2(t)\right) R_j(t), \quad i, j = 1, \ldots, N.$$

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UDC: 517.957

INTEGRATION OF THE PERIODIC TODA-TYPE LATTICE WITH AN INTEGRAL SOURCE

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Abstract. In this paper the inverse spectral problem is applied to the integration of the periodic Toda-type Lattice with an integral source.

Annotatsiya.Mazkur ishda teskari spectral masalalar usuli integral manbali davriy Toda zanjiri turidagi tenglamani integrallashga tadbiq etilgan.

Аннотация. В этой работе метод обратной спектральной задачи применяется к интегрированию уравнения типа периодической цепочки Тоды с интегральным источником.

Key words. Toda lattice, discrete Hill Equation, an integral source, inverse spectral problem, trace formulas.

Kalit so`zlar. Toda zanjiri, diskret Xill tenglamasi, integral manba, teskari spectral masala, izlar formulasi.

Ключевые слова. Цепочка Тоды, дискретный оператор Хилла, интегральный источник, обратная спектральная задача, формулы следов.

Introduction

The Toda lattice [1] is a simple model for a nonlinear one-dimensional crystal that describes the motion of a chain of particles with exponential interactions of the nearest neighbors. It is well known that, by means of the Flaschka variables [2], the Toda lattice has the form

$$\begin{cases} \dot{a}_n = a_n(b_{n+1} - b_n), \\ \dot{b}_n = 2(a_n^2 - a_{n-1}^2), \quad n \in Z. \end{cases}$$

Here, we consider N -periodic Toda-type lattice with an integral source

$$\begin{cases} \dot{a}_n = a_n(a_{n+1}^2 - a_{n-1}^2) + a_n(b_{n+1}^2 - b_n^2) + a_n \int_E \tilde{\theta}_{N+1}(\lambda,t)[\psi_{n+1}^-(\lambda,t)\psi_{n+1}^+(\lambda,t) - \psi_n^-(\lambda,t)\psi_n^+(\lambda,t)]d\lambda, \\ \dot{b}_n = 2a_n^2(b_{n+1} + b_n) - 2a_{n-1}^2(b_n + b_{n-1}) + a_n \int_E \tilde{\theta}_{N+1}(\lambda,t)[\psi_n^-(\lambda,t)\psi_{n+1}^+(\lambda,t) + \psi_{n+1}^-(\lambda,t)\psi_n^+(\lambda,t)]d\lambda - \\ - a_{n-1} \int_E \tilde{\theta}_{N+1}(\lambda,t)[\psi_n^-(\lambda,t)\psi_{n-1}^+(\lambda,t) + \psi_{n-1}^-(\lambda,t)\psi_n^+(\lambda,t)]d\lambda, \\ a_{n+N} = a_n, \ b_{n+N} = b_n, \ a_n > 0, n \in Z, \ t \in R, \end{cases} \tag{1}$$

and the initial conditions

$$a_n(0) = a_n^0, \ b_n(0) = b_n^0, \quad n \in Z, \tag{2}$$

with the given N -periodical sequences a_n^0 and b_n^0, $n \in Z$. In system (1), function sequences $\{a_n(t)\}_{-\infty}^{\infty}$, $\{b_n(t)\}_{-\infty}^{\infty}$, $\{\psi_n^{\pm}(\lambda,t)\}_{-\infty}^{\infty}$ – are unknown vector-functions,

besides, $\{\psi_n^{\pm}(\lambda,t)\}_{-\infty}^{\infty}$ are the Floquet-Bloch solutions for the discrete Hill's equation

$$\left(L(t)y\right)_n \equiv a_{n-1}y_{n-1} + b_n y_n + a_n y_{n+1} = \lambda y_n, \tag{3}$$

normalized by conditions

$$\psi_1^{\pm}(\lambda,t) = 1. \tag{4}$$

In system (1), E is spectrum of the operator $L(0)$, and the factor $\tilde{\theta}_{N+1}(\lambda,t)$ is defined from the equality $\tilde{\theta}_{N+1}(\lambda,t) = \prod_{j=1}^{N-1}(\lambda - \mu_j(t))$, where $\mu_1(t), \mu_2(t), ..., \mu_{N-1}(t)$ are the roots of the equation $\theta_{N+1}(\lambda,t) = 0$. Here, $\theta_n(\lambda,t)$, $n \in Z$ are solutions of the equation (3) with the initial conditions $\theta_0(\lambda,t) = 1$, $\theta_1(\lambda,t) = 0$.

Currently, the nonlinear evolution equations with self-consistent sources arouse active interest because of different physical applications. Usually, the right-hand side of nonlinear evolution equations with a self-consistent source integrable by the inverse spectral transform method consists of terms multiplied by integral factors depending on all the dynamical variables.

It is shown in the works [2, 3] that Toda lattice equation can be integrated by Inverse Scattering Method for the discrete Sturm-Liuville operator. The periodic Toda lattice was considered in the works [4]-[6].

The integrability of the Korteweg–de Vries (KdV) equation with a self-consistent source in the class of rapidly decreasing functions was shown in the work [7], and the same for the Toda chain was shown in [8].

Nonlinear equations with a self-consistent source in the class of periodic functions were studied in [9], and an analogous result for the periodic Toda chain was obtained in [10, 11]. Here, we obtain a representation for the solution of problem (1) – (4) in the framework of the inverse spectral problem for Eq. (3). Namely, we find an analogue of the Dubrovin system of equations for the spectral parameters of the discrete operator $L(t)$.

The basic information about the theory of Direct and Inverse Spectral Problem for the discrete Hill's equation

In this section we give basic information about the theory of direct and inverse spectral problem for the discrete Hill's equation [9].

We start with the following discrete Hill's equation

$$\left(Ly\right)_n \equiv a_{n-1}y_{n-1} + b_n y_n + a_n y_{n+1} = \lambda y_n, \tag{5}$$

$$a_{n+N} = a_n, \quad b_{n+N} = b_n, \quad n \in Z,$$

with spectral parameter λ, and with period $N > 0$. Let $\theta_n(\lambda)$, $n \in Z$ and $\varphi_n(\lambda)$, $n \in Z$ be the solutions of equation (5) under the initial conditions

$$\theta_0(\lambda) = 1, \ \theta_1(\lambda) = 0, \ \varphi_0(\lambda) = 0, \ \varphi_1(\lambda) = 1.$$

Let $\lambda_1, \lambda_2, ..., \lambda_{2N}$ be the roots of equation

$$\Delta^2(\lambda) - 4 = 0.$$

We define the auxiliary spectrum $\mu_1, \mu_2, ..., \mu_{N-1}$ as the roots of equation

$$\theta_{N+1}(\lambda) = 0 .$$

As it is known (see. [1]), all λ_i, $i = 1, 2, ..., 2N$ and μ_j, $j = 1, 2, ..., N-1$ are real, the roots μ_j are simple, but among the roots λ_i may occur the roots of multiplicity two.

It is easy to show, that

$$\Delta^2(\lambda) - 4 = \left(\prod_{j=1}^{N} a_j \right)^{-2} \prod_{j=1}^{2N} (\lambda - \lambda_j),$$

$$\theta_{N+1}(\lambda) = -a_0 \left(\prod_{j=1}^{N} a_j \right)^{-1} \prod_{j=1}^{N-1} (\lambda - \mu_j) .$$

We shall introduce

$$\sigma_j = sign\left[\theta_N(\mu_j) - \frac{1}{\theta_N(\mu_j)} \right], \ j = 1, 2, ..., N-1 .$$

Definition 1. The set of the numbers μ_j, $j = 1, 2, ..., N-1$ and sequences of signs σ_j, $j = 1, 2, ..., N-1$ is called spectral parameters of the discrete Hill's equation (5).

Definition 2. System of spectral parameters $\{\mu_j, \sigma_j\}_{j=1}^{N-1}$ and numbers λ_i, $i = 1, 2, ..., 2N$ is called spectral data of the discrete Hill's equation (5).

It is easy to see that the following statement is true.

Lemma 2. If $\{x_n(\lambda)\}_{-\infty}^{\infty}$ and $\{y_n(\mu)\}_{-\infty}^{\infty}$ are solutions of equations $Lx = \lambda x$ and $Ly = \mu y$, respectively. Then the identity

$$(\mu - \lambda) x_n(\lambda) y_n(\mu) = W\{x_n(\lambda), y_n(\mu)\} - W\{x_{n-1}(\lambda), y_{n-1}(\mu)\}, \quad n \in Z ,$$

holds, where $W\{x_n(\lambda), y_n(\mu)\} = a_n[x_n(\lambda) y_{n+1}(\mu) - x_{n+1}(\lambda), y_n(\mu)]$.

Evolution of spectral parameters

In this section, we prove the basic result of this paper.

Theorem. If the functions $a_n(t)$, $b_n(t)$, $\psi_n^{\pm}(\lambda, t)$, $n \in Z$ are solutions of the problem (1)-(4), then the spectrum of discrete Hill operator (3) is independent of t, and spectral parametres $\mu_j(t)$, $j = 1, 2, ..., N-1$, satisfy the system of equations

$$\dot{\mu}_j(t) = -2 \frac{\sigma_j(t) \cdot \sqrt{\prod_{k=1}^{2N} (\mu_j(t) - \lambda_k(t))}}{\prod_{\substack{k=1 \\ k \neq j}}^{N-1} (\mu_j(t) - \mu_k(t))} \cdot \left\{ b_1(t) + \mu_j(t) + \int_E \tilde{\theta}_{N+1}(\lambda, t) \frac{1}{\lambda - \mu_j(t)} d\lambda \right\}. \quad (6)$$

where

$$b_1(t) = \frac{\lambda_1 + \lambda_{2N}}{2} + \frac{1}{2} \sum_{k=1}^{N-1} \left(\lambda_{2k} + \lambda_{2k+1} - 2\mu_k(t) \right).$$

Proof. Let $y^j(t)=(y_0^j(t), y_1^j(t), ..., y_N^j(t))^T$, $j=1, 2, ..., N-1$ denote the orthonormal zed eigenvectors for the corresponding eigenvalues $\lambda=\mu_j(t)$, $j=1, 2, ..., N-1$, associated with the following boundary problem

$$\begin{cases}(L(t)y)_n \equiv a_{n-1}y_{n-1}+b_n y_n+a_n y_{n+1}=\lambda y_n, \ 1\le n\le N\\ y_1=0, \ y_{N+1}=0.\end{cases}$$

In [11], was shown that

$$\dot{\mu}_j(t)=\sum_{n=1}^{N}(2\dot{a}_n(t)y_n^j y_{n+1}^j+\dot{b}_n(t)(y_n^j)^2).$$

Using (1), the last equality can be rewritten as follows

$$\dot{\mu}_j(t)=\sum_{n=1}^{N}2[a_n(a_{n+1}^2-a_{n-1}^2)+a_n(b_{n+1}^2-b_n^2)]y_n^j y_{n+1}^j+$$

$$+\sum_{n=1}^{N}[2a_n^2(b_{n+1}+b_n)-2a_{n-1}^2(b_n+b_{n-1})](y_n^j)^2+$$

$$+\sum_{n=1}^{N}\left\{2a_n\int_E\tilde{\theta}_{N+1}(\lambda,t)[\psi_{n+1}^-(\lambda,t)\psi_{n+1}^+(\lambda,t)-\psi_n^-(\lambda,t)\psi_n^+(\lambda,t)]d\lambda\right\}y_n^j y_{n+1}^j+$$

$$+\sum_{n=1}^{N}\left\{a_n\int_E\tilde{\theta}_{N+1}(\lambda,t)[\psi_n^-(\lambda,t)\psi_{n+1}^+(\lambda,t)+\psi_{n+1}^-(\lambda,t)\psi_n^+(\lambda,t)]d\lambda\right\}(y_n^j)^2-$$

$$-\sum_{n=1}^{N}\left\{a_{n-1}\int_E\tilde{\theta}_{N+1}(\lambda,t)[\psi_n^-(\lambda,t)\psi_{n-1}^+(\lambda,t)+\psi_{n-1}^-(\lambda,t)\psi_n^+(\lambda,t)]d\lambda\right\}(y_n^j)^2.$$

For convenience, let us put

$$F^j(\lambda,t)=\sum_{n=1}^{N}\left\{2a_n[\psi_{n+1}^-(\lambda,t)\psi_{n+1}^+(\lambda,t)-\psi_n^-(\lambda,t)\psi_n^+(\lambda,t)]\right\}y_n^j y_{n+1}^j+$$

$$+\sum_{n=1}^{N}\left\{a_n[\psi_n^-(\lambda,t)\psi_{n+1}^+(\lambda,t)+\psi_{n+1}^-(\lambda,t)\psi_n^+(\lambda,t)]\right\}(y_n^j)^2-$$

$$-\sum_{n=1}^{N}\left\{a_{n-1}[\psi_n^-(\lambda,t)\psi_{n-1}^+(\lambda,t)+\psi_{n-1}^-(\lambda,t)\psi_n^+(\lambda,t)]\right\}(y_n^j)^2,$$

$$H_n=2[a_n(a_{n+1}^2-a_{n-1}^2)+a_n(b_{n+1}^2-b_n^2)]y_n^j y_{n+1}^j+$$

$$+[2a_n^2(b_{n+1}+b_n)-2a_{n-1}^2(b_n+b_{n-1})](y_n^j)^2.$$

We will find sequences u_n, that $u_{n+1}-u_n=H_n$. We seek for u_n as follows

$$u_n=A_n(y_n^j)^2+2B_n y_n^j y_{n+1}^j+C_n(y_{n+1}^j)^2, \qquad (7)$$

where $A_n=A_n(t,\mu_j)$, $B_n=B_n(t,\mu_j)$ and $C_n=C_n(t,\mu_j)$ are unknown coefficients yet. Due to

$$y_{n+2}^j=\frac{1}{a_{n+1}}[(\mu_j-b_{n+1})y_{n+1}^j-a_n y_n^j]$$

we have

$$(A_{n+1}-C_n)(y_{n+1}^j)^2-A_n(y_n^j)^2-2B_n y_n^j y_{n+1}^j+\frac{2B_{n+1}}{a_{n+1}}y_{n+1}^j[(\mu_j-b_{n+1})y_{n+1}^j-a_n y_n^j]+$$

$$+\frac{C_{n+1}}{a_{n+1}^2}(\mu_j - b_{n+1})^2 (y_{n+1}^j)^2 - \frac{2C_{n+1}}{a_{n+1}^2} a_n(\mu_j - b_{n+1}) y_n^j y_{n+1}^j + \frac{C_{n+1}}{a_{n+1}^2} a_n^2 (y_n^j)^2 = H_n . \quad (8)$$

From the equality (8) we get

$$-B_n - \frac{a_n}{a_{n+1}} B_{n+1} - \frac{a_n(\mu_j - b_{n+1})}{a_{n+1}^2} C_{n+1} = a_n(a_{n+1}^2 - a_{n-1}^2) + a_n(b_{n+1}^2 - b_n^2), \quad (9)$$

$$-C_{n-1} + \frac{2(\mu_j - b_n)}{a_n} B_n + \frac{(\mu_j - b_n)^2}{a_n^2} C_n + \frac{a_n^2}{a_{n+1}^2} C_{n+1} = 2a_n^2(b_{n+1} + b_n) - 2a_{n-1}^2(b_n + b_{n-1}) . \quad (10)$$

It is easy to check that

$$C_n = 2a_n^2(\mu_j + b_n), \quad B_n = a_n(a_{n-1}^2 - a_n^2 + b_n^2 - \mu_j^2)$$

are solutions to the system (9) and (10). By virtue of (7), we obtain

$$\dot{\mu}_j(t) = \sum_{n=1}^{N} 2[a_n(a_{n+1}^2 - a_{n-1}^2) + a_n(b_{n+1}^2 - b_n^2)] y_n^j y_{n+1}^j +$$

$$+ \sum_{n=1}^{N} [2a_n^2(b_{n+1} + b_n) - 2a_{n-1}^2(b_n + b_{n-1})](y_n^j)^2 + \int_E \tilde{\theta}_{N+1}(\lambda,t) F^j(\lambda,t) d\lambda =$$

$$= C_{N+1}(y_{N+2}^j)^2 - C_1(y_2^j)^2 + \int_E \tilde{\theta}_{N+1}(\lambda,t) F^j(\lambda,t) d\lambda =$$

$$= 2a_0^2(\mu_j(t) + b_1(t))[(y_N^j)^2 - (y_0^j)^2] + \int_E \tilde{\theta}_{N+1}(\lambda,t) F^j(\lambda,t) d\lambda . \quad (11)$$

Using the form of $F^j(\lambda,t)$, we find that

$$F^j(\lambda,t) = \sum_{n=1}^{N} a_n \psi_{n+1}^-(\lambda,t)\psi_{n+1}^+(\lambda,t) y_n^j y_{n+1}^j - \sum_{n=1}^{N} a_n \psi_n^-(\lambda,t)\psi_{n+1}^+(\lambda,t)(y_{n+1}^j)^2 +$$

$$+ \sum_{n=1}^{N} a_n \psi_{n+1}^-(\lambda,t)\psi_{n+1}^+(\lambda,t) y_n^j y_{n+1}^j - \sum_{n=1}^{N} a_n \psi_{n+1}^-(\lambda,t)\psi_n^+(\lambda,t)(y_{n+1}^j)^2 +$$

$$+ \sum_{n=1}^{N} a_n \psi_n^-(\lambda,t)\psi_{n+1}^+(\lambda,t)(y_n^j)^2 - \sum_{n=1}^{N} a_n \psi_n^-(\lambda,t)\psi_n^+(\lambda,t) y_{n+1}^j y_n^j +$$

$$+ \sum_{n=1}^{N} a_n \psi_{n+1}^-(\lambda,t)\psi_n^+(\lambda,t)(y_n^j)^2 - \sum_{n=1}^{N} a_n \psi_n^-(\lambda,t)\psi_n^+(\lambda,t) y_{n+1}^j y_n^j =$$

$$= \sum_{n=1}^{N} a_n(\psi_{n+1}^+(\lambda,t) y_n^j - \psi_n^+(\lambda,t) y_{n+1}^j)\psi_n^-(\lambda,t) y_n^j + \sum_{n=1}^{N} a_n(\psi_{n+1}^+(\lambda,t) y_n^j - \psi_n^+(\lambda,t) y_{n+1}^j)\psi_{n+1}^-(\lambda,t) y_{n+1}^j +$$

$$+ \sum_{n=1}^{N} a_n(\psi_{n+1}^-(\lambda,t) y_n^j - \psi_n^-(\lambda,t) y_{n+1}^j)\psi_n^+(\lambda,t) y_n^j + \sum_{n=1}^{N} a_n(\psi_{n+1}^-(\lambda,t) y_n^j - \psi_n^-(\lambda,t) y_{n+1}^j)\psi_{n+1}^+(\lambda,t) y_{n+1}^j =$$

$$= \sum_{n=1}^{N} T_n \psi_n^-(\lambda,t) y_n^j + \sum_{n=1}^{N} T_n \psi_{n+1}^-(\lambda,t) y_{n+1}^j + \sum_{n=1}^{N} W_n \psi_n^+(\lambda,t) y_n^j + \sum_{n=1}^{N} W_n \psi_{n+1}^+(\lambda,t) y_{n+1}^j =$$

$$= \sum_{n=1}^{N} \psi_{n+1}^-(\lambda,t) y_{n+1}^j (T_{n+1} + T_n) + \sum_{n=1}^{N} \psi_{n+1}^+(\lambda,t) y_{n+1}^j (W_{n+1} + W_n) =$$

$$= \sum_{n=1}^{N} \frac{1}{\lambda - \mu_j(t)} (W_{n+1} - W_n)(T_{n+1} + T_n) + \sum_{n=1}^{N} \frac{1}{\lambda - \mu_j(t)} (T_{n+1} - T_n)(W_{n+1} + W_n) =$$

$$= \frac{2}{\lambda - \mu_j(t)} \sum_{n=1}^{N} (W_{n+1}T_{n+1} - W_n T_n) = \frac{2}{\lambda - \mu_j(t)} (W_{N+1}T_{N+1} - W_1 T_1) ,$$

where $T_n = a_n(\psi^+_{n+1}(\lambda,t)y^j_n - \psi^+_n(\lambda,t)y^j_{n+1})$ and $W_n = a_n(\psi^-_{n+1}(\lambda,t)y^j_n - \psi^-_n(\lambda,t)y^j_{n+1})$. It is easy to see that

$$W_{N+1}T_{N+1} = a_{N+1}(\psi^-_{N+2}(\lambda,t)y^j_{N+1} - \psi^-_{N+1}(\lambda,t)y^j_{N+2})a_{N+1}(\psi^+_{N+2}(\lambda,t)y^j_{N+1} - \psi^+_{N+1}(\lambda,t)y^j_{N+2}) =$$
$$= (-\psi^-_{N+1}(\lambda,t)a_{N+1}y^j_{N+2})(-\psi^+_{N+1}(\lambda,t)a_{N+1}y^j_{N+2}) =$$
$$= (-\psi^-_{N+1}(\lambda,t)a_{N+1}y^j_{N+2})(-\psi^+_{N+1}(\lambda,t)a_{N+1}y^j_{N+2}) = \psi^-_{N+1}(\lambda,t)a_N y^j_N \psi^+_{N+1}(\lambda,t)a_N y^j_N =$$
$$= a_N(y^j_N)^2\psi^-_{N+1}(\lambda,t)\psi^+_{N+1}(\lambda,t) = a_N(y^j_N)^2.$$
$$W_1T_1 = a_0^2(y^j_0)^2.$$

Thus, we get

$$F^j(\lambda,t) = \frac{2a_0^2}{\lambda - \mu_j(t)}[(y^j_N)^2 - (y^j_0)^2]. \tag{12}$$

Substituting (12) in (11), we derive

$$\dot{\mu}_j(t) = 2a_0^2[(y^j_N)^2 - (y^j_0)^2]\left\{\mu_j(t) + b_1(t) + \int_E \tilde{\theta}_{N+1}(\lambda,t)\frac{1}{\lambda - \mu_j(t)}d\lambda\right\}. \tag{13}$$

By virtue of the equalities

$$\left\|\theta^j\right\|^2 = \sum_{n=1}^{N}(\theta^j_n)^2 = a_N\theta^j_N(\theta^j_{N+1})'\Big|_{\lambda=\mu_j},\ (\theta^j)' = \frac{d\theta^j}{d\lambda},$$
$$(y^j_0)^2 = \frac{(\theta^j_0)^2}{\left\|\theta^j\right\|^2},\ (y^j_N)^2 = \frac{(\theta^j_N)^2}{\left\|\theta^j\right\|^2},$$

we can write the equation (13) in the form

$$\dot{\mu}_j(t) = \frac{2a_0\left(\theta^j_N(\mu_j(t),t) - \dfrac{1}{\theta^j_N(\mu_j(t),t)}\right)}{(\theta^j_{N+1})'\Big|_{\lambda=\mu_j(t)}}\cdot\left\{\mu_j(t) + b_1(t) + \int_E \tilde{\theta}_{N+1}(\lambda,t)\frac{1}{\lambda - \mu_j(t)}d\lambda\right\}. \tag{14}$$

It is easy to check that

$$\theta^j_N(\mu_j(t),t) - \frac{1}{\theta^j_N(\mu_j(t),t)} = \sigma_j(t)\sqrt{\Delta^2(\mu_j(t)) - 4}, \tag{15}$$

$$\theta'_{N+1}(\lambda)\Big|_{\lambda=\mu_j(t)} = -a_0\left(\prod_{k=1}^{N}a_k\right)^{-1}\prod_{\substack{k=1\\k\neq j}}^{N-1}(\mu_j(t) - \mu_k(t)), \tag{16}$$

where $\sigma_j(t) = sign\left(\theta^j_N(\mu_j(t),t) - \varphi^j_{N+1}(\mu_j(t),t)\right),\ j = 1, 2, ..., N-1.$

Substituting (15) and (16) in (14) we obtain equality (6).

We now show that $\lambda_k(t)$ is independent of t. Let $\{g^k_n(t)\}$ be the normalized eigenfunction of the operator $L(t)$ corresponding to the eigenvalue $\lambda_k(t)$, $k = 1, 2, ..., 2N$, i.e.

$$a_{n-1}g^k_{n-1} + b_n g^k_n + a_n g^k_{n+1} = \lambda_k g^k_n.$$

By differentiating the last identity with respect to t, multiplying by g^k_n and summing over n we get

$$\frac{d\lambda_k}{dt} = \sum_{n=1}^{N}\left(2\dot{a}_n(t)g_n^k g_{n+1}^k + \dot{b}_n(t)\left(g_n^k\right)^2\right). \qquad (17)$$

Using the equation (1), we can write the equality (17) as

$$\dot{\lambda}_k(t) = 2\sum_{n=1}^{N}[a_n(a_{n+1}^2 - a_{n-1}^2) + a_n(b_{n+1}^2 - b_n^2)]g_n^k g_{n+1}^k +$$

$$+\sum_{n=1}^{N}[2a_n^2(b_{n+1}+b_n) - 2a_{n-1}^2(b_n + b_{n-1})](g_n^k)^2 + \int_E \tilde{\theta}_{N+1}(\lambda,t)F^j(\lambda,t)d\lambda. \qquad (18)$$

Similarly to (13), from the equality (18) we get $\dot{\lambda}_k(t) = 0$. **The theorem is proved.**

Remark. This theorem provides the method for solving the problem (1) -(4).

(i) Solving the direct spectral problem for the discrete Hill's equation with $\{a_n^0\}$ and $\{b_n^0\}$ the spectral data $\lambda_i,\ i = 1,2,...,2N$ and $\mu_j(0),\ \sigma_j(0), i = 1,2,...,N-1$ are obtained.

(ii) Using the result of Theorem, we find the $\mu_j(t),\ \sigma_j(t), i = 1,2,...,N-1$

(iii) Using the algorithm which is presented in [10], we calculate $a_k(t), b_k(t)$ and hence $\psi_k^{\pm}(\lambda,t)$.

Corollary. *If $N = 2p$ and the number p is the period of the initial sequences $\{a_n^0\}$ and $\{b_n^0\}$, then all roots of the equation $\Delta(\lambda) + 2 = 0$ are double roots. Because the Lyapunovfunction corresponding to the coefficients $a_n(t)$ and $b_n(t)$ coincides with $\Delta(\lambda)$, according to the analogue of the Borg inverse theorem for the discrete Hill equation* (*see* [12]), *the number p is also the period of the solution $a_n(t)$, $b_n(t)$ with respect to the variable n.*

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UDC: 517.956

INTEGRATION OF LOADED MODIFIED KORTEWEG-DE VRIES EQUATION WITH SELF-CONSISTENT SOURCE

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Abstract. In this paper the method of inverse spectral problem applies to the integration of the modified Korteweg-de Vries equation with a loaded term.

Аннотация. Мазкур ишда тескари спектрал масалалар усули мосланган манбали юкланган модифицирланган Кортевег-де Фриз тенгламасини интегралашга қўлланилиши асосланган.

Аннотация. В этой работе обоснован метод обратной спектральной задачи, который применяется к интегрированию нагруженного модифицированного уравнения Кортевега-де Фриза с самосогласованным источником.

Key words: Dirac’s operator, spectral data, the system of equations of Dubrovin-Trubowitz, modified Korteweg - de Vries equation with a self-consistent source.

Kalit so’zlar: Dirak operatori, spectral berilganlar, Dubrovin-Trubovisa tenglamalar sistemasi, moslangan manbali modifitsirlanganKorteveg-deFriztenglamasi.

Ключевые слова: Оператор Дирака, спектральные данные, система уравнений Дубровина-Трубовица, модифицированное уравнение Кортевега-де Фриза с самосогласованным источником.

One of the members of the class of completely integrable nonlinear partial differential equations, which has great practical applications, is the modified Korteweg-de Vries (mKdV) equation. Complete integrability of this equation via the inverse scattering method in the class of rapidly decreasing functions was first introduced in the work of M. Vadati (see [1].). The works [2, 3] are dedicated to the studying of mKdV equation in the class of finite functions.

In the work of [4] V.K. Melnikova by using the inverse scattering method, the KdV equation with self-consistent source was integrated in the class of rapidly decreasing functions.

In this current work, a loaded mKdV equation with self-consistent source in the class of periodic functions is studied. It should be noted, that mKdV equation with self-consistent source in the class of rapidly decreasing functions was considered in the works [5] and the non-linear equation with self-consistent source in the class of periodic functions, in various formulations were studied in [6 - 8].

Let's consider the following loaded mKdV equation with self-consistent source

$$q_t = 6q^2 q_x - q_{xxx} + \gamma(t)\cdot q\big|_{x=0}\cdot q_x + \int_{-\infty}^{\infty}\beta(\lambda,t)s_1(\pi,\lambda,t)(\psi_1^+\psi_1^- - \psi_2^+\psi_2^-)d\lambda,$$

$$t>0,\ x\in R \quad (1)$$

with the initial condition

$$q(x,t)\big|_{t=0} = q_0(x) \quad (2)$$

in the class of real-valued π periodic functions of x:

$$q(x,t)\in C_x^3(t>0)\cap C_t^1(t>0)\cap C(t\geq 0), \quad (3)$$

where $\gamma(t)$ is the given real continuous function. Here $\beta(\lambda,t)$ is a real, continuous function having a uniform asymptotic behavior of $\beta(\lambda,t)=O\left(\lambda^{-2}\right),\ \lambda\to\pm\infty$, $\psi^{\pm}=(\psi_1^{\pm}(x,\lambda,t),\psi_2^{\pm}(x,\lambda,t))^T$ of the Floquet solutions (with normalized conditions $\psi_1^{\pm}(0,\lambda,t)=1$ of following Dirac equation

$$L(t)y \equiv B\frac{dy}{dx} + \Omega(x+\tau,t)y = \lambda y,\ \ x\in R, \quad (4)$$

where

$$B=\begin{pmatrix}0 & 1\\ -1 & 0\end{pmatrix},\ \Omega(x,t)=\begin{pmatrix}0 & q(x,t)\\ q(x,t) & 0\end{pmatrix},\ y=\begin{pmatrix}y_1(x)\\ y_2(x)\end{pmatrix}.$$

By $s(x,\lambda,t)=(s_1(x,\lambda,t),s_2(x,\lambda,t))^T$ is denoted the solution of the equation (4), satisfying the initial conditions $s(0,\lambda,t)=(0,1)^T$.

The aim of this work is to give a procedure for constructing the solution $(q(x,t),\psi^+(x,\lambda,t),\psi^-(x,\lambda,t))$ of the problem (1) - (4), within the inverse spectral problem for the Dirac equation (4).

Here, for completeness, we present some basic information regarding the inverse spectral problem for the Dirac operator with periodic coefficients (see. [9-12]).

Let us consider the system of Dirac equations on the whole line

$$Ly \equiv \begin{pmatrix}0 & 1\\ -1 & 0\end{pmatrix}\begin{pmatrix}y_1'\\ y_2'\end{pmatrix} + \begin{pmatrix}p(x) & q(x)\\ q(x) & -p(x)\end{pmatrix}\begin{pmatrix}y_1\\ y_2\end{pmatrix} = \lambda\begin{pmatrix}y_1\\ y_2\end{pmatrix},\ x\in R, \quad (5)$$

where $p(x)$ and $q(x)$ are continuous real functions of class $C^1(R)$, having a period π and λ as complex parameter.

Let's denote by $c(x,\lambda)=\left(c_1(x,\lambda),c_2(x,\lambda)\right)^T$ and $s(x,\lambda)=\left(s_1(x,\lambda),s_2(x,\lambda)\right)^T$ the solution of the equation (5) satisfying the initial conditions $c(0,\lambda)=(1,0)^T$ and $s(0,\lambda)=(0,1)^T$.

The function $\Delta(\lambda) = c_1(\pi,\lambda) + s_2(\pi,\lambda)$ is called Lyapunov function or Hill discriminant for the Dirac operator (5). The following statement is the content of the Floquet's theorem: while $\Delta^2(\lambda) - 4 \neq 0$, the equation (5) has two linearly independent solutions of the form: $\psi^{\pm}(x,\lambda) = \rho_{\pm}^{\frac{x}{\pi}} \cdot p^{\pm}(x,\lambda)$, where $p^{\pm}(x,\lambda)$ - π - periodic vector functions of x and $\rho_{\pm} = (\Delta(\lambda) \mp \sqrt{\Delta^2(\lambda) - 4})/2$; while $\Delta(\lambda) = 2$, equation (5) has a solution with a period π; while $\Delta(\lambda) = -2$, equation (5) has a solution with antiperiod π. If you put $\psi_1^{\pm}(0,\lambda) = 1$, then

$$\psi^{\pm}(x,\lambda) = c(x,\lambda) + \frac{s_2(\pi,\lambda) - c_1(\pi,\lambda) \mp \sqrt{\Delta^2(\lambda) - 4}}{2s_1(\pi,\lambda)} s(x,\lambda).$$

These solutions are called Floquet solutions.

The spectrum of operator (5) consists of the following set

$$E = \{\lambda \in R:\ -2 \le \Delta(\lambda) \le 2\} = R \setminus \left\{ \bigcup_{n=-\infty}^{\infty} (\lambda_{2n-1}, \lambda_{2n}) \right\}.$$

The intervals $(\lambda_{2n-1}, \lambda_{2n})$, $n \in Z$ are called lacunas.

The roots of the equation $s_1(\pi,\lambda) = 0$ are denoted by ξ_n, $n \in Z$. Numbers ξ_n, $n \in Z$ coincide with the eigenvalues of the Dirichlet problem $y_1(0) = 0$, $y_1(\pi) = 0$ for the system (5) and $\xi_n \in [\lambda_{2n-1}, \lambda_{2n}]$, $n \in Z$ relations are hold.

Numbers $\xi_n \in [\lambda_{2n-1}, \lambda_{2n}]$, $n \in Z$ and signs $\sigma_n = sign\{s_2(\pi,\xi_n) - c_1(\pi,\xi_n)\}$, $n \in Z$ are called spectral parameters of the problem (5). The spectral parameters ξ_n, σ_n, $n \in Z$ and the boundaries of the spectrum λ_n, $n \in Z$ are called spectral data of the problem (5). Finding the spectral data of the problem (5) is a direct problem and finding the coefficients $p(x)$ and $q(x)$ from the spectral data is called the inverse problem.

If in the problem (5) instead of $p(x)$ and $q(x)$ consider $p(x+\tau)$ and $q(x+\tau)$, then the spectrum of the resulting problem is independent of parameter τ: $\lambda_n(\tau) \equiv \lambda_n$, $n \in Z$, and the spectral parameters depend on the parameter: $\xi_n(\tau)$, $\sigma_n(\tau)$, $n \in Z$. These spectral parameters satisfy the analogue system of Dubrovin equations:

$$\frac{d\xi_n}{d\tau} = (-1)^{n-1} \sigma_n(\tau) h_n(\xi(\tau)) \left\{ 2\xi_n(\tau) + \sum_{k=-\infty}^{\infty} (\lambda_{2k-1} + \lambda_{2k} - 2\xi_k(\tau)) \right\},\ n \in Z,$$

where

$$h_n(\xi) = \sqrt{(\xi_n(\tau) - \lambda_{2n-1})(\lambda_{2n} - \xi_n(\tau))} \cdot \sqrt{\prod_{\substack{k=-\infty \\ k \neq n}}^{\infty} \frac{(\lambda_{2k-1} - \xi_n(\tau))(\lambda_{2k} - \xi_n(\tau))}{(\xi_k(\tau) - \xi_n(\tau))^2}}.$$

Sign $\sigma_n(\tau)$ - is changed in each collision of $\xi_n(\tau)$ with the boundaries of their lacunas $[\lambda_{2n-1}, \lambda_{2n}]$.

The system of Dubrovin equations, as well as the following trace formulas

$$p(\tau)=\sum_{k=-\infty}^{\infty}\left(\frac{\lambda_{2k-1}+\lambda_{2k}}{2}-\xi_k(\tau)\right),\ q(\tau)=\sum_{n=-\infty}^{\infty}(-1)^{n-1}\sigma_n(\tau)h_n(\xi(\tau))$$

provide a method for solving the inverse spectral problem. In [12] it is proved the analogue of the Borg's inverse theorem in the case of the Dirac operator.

Theorem 1. In order that the number $\frac{\pi}{2}$ to be the period of the coefficients $p(x)$ and $q(x)$ of the system of equations (5), it is necessary and sufficient that the all eigenvalues of antiperiodic problem ($y(0)=-y(\pi)$) for the system (5) are to be two-folded.

In the work [11], by using the system of Dubrovin equations and trace formulas, the following theorem is proved that connects the decay lengths of lacunas with the analyticity of the coefficients $p(x)$ and $q(x)$ of system of Dirac equations (5).

Theorem 2. In order that the coefficients $p(x)$ and $q(x)$ of Dirac operator be real, analytical, π -periodic function it is necessary and sufficient the exponential decay of lengths of lacunas in the spectrum, that is, the existence of constant numbers $a>0, b>0$, for which $\lambda_{2n}-\lambda_{2n-1}<ae^{-b|n|}$, for any integer n.

We will show the uniform convergence of the integral in equation (1). For this we use the following identities

$$s_1(\pi,\lambda,t)[\psi_1^+(\tau,\lambda,t)\psi_1^-(\tau,\lambda,t)-\psi_2^-(\tau,\lambda,t)\psi_2^+(\tau,\lambda,t)]=s_1(\pi,\lambda,t,\tau)+c_2(\pi,\lambda,t,\tau), \quad (6)$$

where $c(x,\lambda,t,\tau)$ and $s(x,\lambda,t,\tau)$ - are the solutions of Dirac system with coefficients $p(x+\tau,t)$ and $q(x+\tau,t)$, which satisfy the initial conditions $c(0,\lambda,t,\tau)=1,\ c'(0,\lambda,t,\tau)=0$ and $s(0,\lambda,t,\tau)=0,\ s'(0,\lambda,t,\tau)=1.$

From the asymptotic formulas for solutions $c(x,\lambda,t,\tau)$ and $s(x,\lambda,t,\tau)$ follows the estimation

$$s_1(\pi,\lambda,t,\tau)+c_2(\pi,\lambda,t,\tau)=O\left(\frac{1}{\lambda}\right), \text{ in } \lambda\to\pm\infty.$$

This evaluation and equality (6) provides the uniform convergence of the integral in the equation (1).

The main result will be formulated as a theorem.

Theorem 3. Let ($q(x,t), \psi^+(x,\lambda,t), \psi^-(x,\lambda,t)$) be a solution of problem (1) - (4). Then the spectrum of the Dirac operator with a coefficient $q(x+\tau,t)$ does not depend on τ and t. Moreover, spectral parameters $\xi_n=\xi_n(\tau,t),\ n\in Z$ satisfy the system of Dubrovin equations

$$\frac{\partial \xi_n}{\partial t} = 2(-1)^n \sigma_n(\tau,t) h_n(\xi) \times$$

$$\times \{-2\xi_n[q^2(\tau,t) + q_x(\tau,t)] - 4\xi_n^3 - \gamma(t)\xi_n q(0,t) + \int_{-\infty}^{\infty} \frac{\xi_n \beta(\lambda,t) s_1(\pi,\lambda,t)}{\xi_n^2 - \lambda^2} d\lambda\},.\ n \in Z$$

(7)

Signs $\sigma_n(\tau,t) = \pm 1$ change in each collision point $\xi_n(\tau,t)$ with the boundaries of their lacunas $[\lambda_{2n-1}, \lambda_{2n}]$. In addition, the following initial conditions are satisfied

$$\xi_n(\tau,t)\big|_{t=0} = \xi_n^0(\tau),\ \sigma_n(\tau,t)\big|_{t=0} = \sigma_n^0(\tau),\ n \in Z, \qquad (8)$$

where $\xi_n^0(\tau),\ \sigma_n^0(\tau)\ n \in Z$ - spectral parameters of the Dirac operator with coefficients $p_0(x) = 0$ and $q_0(x+\tau)$.

Proof. Let's denote $y_n = \left(y_{n,1}(x,\tau,t), y_{n,2}(x,\tau,t)\right)^T,\ n \in Z$ orthonormal eigenvector functions of the Dirichlet problem ($y_1(0) = 0, y_1(\pi) = 0$) for the equation (4), corresponding to the eigenvalues $\xi_n = \xi_n(\tau,t),\ n \in Z$.

Differentiating over t identity $(L(\tau,t)y_n, y_n) = \xi_n$, and using the symmetry of the operator $L(\tau,t)$, we have

$$\dot{\xi}_n = (\dot{\Omega}(x+\tau,t)y_n, y_n). \qquad (9)$$

Using the explicit form of the scalar product

$$(y,z) = \int_0^{\pi} [y_1(x)\bar{z}_1(x) + y_2(x)\bar{z}_2(x)]dx,\quad y = \begin{pmatrix} y_1(x) \\ y_2(x) \end{pmatrix},\ z = \begin{pmatrix} z_1(x) \\ z_2(x) \end{pmatrix},$$

the equation (9) can be written in the form

$$\dot{\xi}_n = 2\int_0^{\pi} y_{n,1} y_{n,2}\, q_t(x+\tau,t)dx.$$

From the identity

$$q_t(x+\tau,t) = 6q^2(x+\tau,t)q_x(x+\tau,t) - q_{xxx}(x+\tau,t) + \gamma(t)\cdot q(0,t)\cdot q_x(x+\tau,t) +$$
$$+ \int_{-\infty}^{\infty} \beta(\lambda,t) s_1(\pi,\lambda,t)(\psi_1^+\psi_1^- - \psi_2^+\psi_2^-)d\lambda$$

follows that

$$\dot{\xi}_n = 2\int_0^{\pi} y_{n,1}y_{n,2}(6q^2q_x - q_{xxx})dx + 2\gamma(t)\cdot q(0,t)\int_0^{\pi} y_{n,1}y_{n,2}q_x\,dx + \qquad (10)$$
$$+ \int_{-\infty}^{\infty} \beta(\lambda,t)s_1(\pi,\lambda,t)\left\{\int_0^{\pi} 2y_{n,1}y_{n,2}(\psi_1^+\psi_1^- - \psi_2^+\psi_2^-)]dx\right\}d\lambda$$

Direct computation shows that,

$$\{2\xi_n q_x \cdot (y_{n,1}^2 - y_{n,2}^2) + 2(4\xi_n^2 q + 2q^3 - q_{xx})y_{n,1}y_{n,2} - 2\xi_n(2\xi_n^2 + q^2)\cdot(y_{n,1}^2 + y_{n,2}^2)\}_x' =$$
$$= 2y_{n,1}y_{n,2}(6q^2q_x - q_{xxx}).$$

That is why,

$$2\int_0^{\pi} y_{n,1}y_{n,2}(6q^2q_x - q_{xxx})dx =$$

$$= -2\xi_n[q^2(\tau,t) + q_x(\tau,t) + 2\xi_n^2]\cdot[y_{n,2}^2(\pi,\tau,t) - y_{n,2}^2(0,\tau,t)]. \qquad (11)$$

It is easy to see that

$$\int_0^{\pi} 2y_{n,1}y_{n,2}q_x dx = -\xi_n[y_{n,2}^2(\pi,\tau,t) - y_{n,2}^2(0,\tau,t)]. \qquad (12)$$

Now we calculate the third integral in (10):

$$\int_0^{\pi} 2y_{n,1}y_{n,2}(\psi_1^+\psi_1^- - \psi_2^+\psi_2^-)dx =$$

$$= \frac{1}{\xi_n^2 - \lambda^2}\left\{\xi_n y_{n,1}^2\psi_2^+\psi_2^- + \xi_n y_{n,2}^2\psi_1^+\psi_1^- - \lambda y_{n,1}y_{n,2}(\psi_1^+\psi_2^- + \psi_2^+\psi_1^-)\right\}\Bigg|_0^{\pi} =$$

$$= \frac{\xi_n}{\xi_n^2 - \lambda^2}[y_{n,2}^2(\pi,\tau,t) - y_{n,2}^2(0,\tau,t)]. \qquad (13)$$

From (10), (11), (12) and (13), we deduce that

$$\dot{\xi}_n = [y_{n,2}^2(\pi,\tau,t) - y_{n,2}^2(0,\tau,t)]\times$$

$$\times\{-2\xi_n[q^2(\tau,t) + q_x(\tau,t)] - 4\xi_n^3 - \gamma(t)\xi_n q(0,t) + \int_{-\infty}^{\infty}\frac{\xi_n\beta(\lambda,t)s_1(\pi,\lambda,t)}{\xi_n^2 - \lambda^2}d\lambda\}. \qquad (14)$$

Let's denote by $s(x,\lambda,\tau,t)$ the solution of the equation (4) which satisfies the initial conditions $s_1(0,\lambda,\tau,t) = 0$, $s_2(0,\lambda,\tau,t) = 1$. Then

$$y_n(x,\tau,t) = \frac{1}{c_n(\tau,t)}s(x,\xi_n,\tau,t),$$

where

$$c_n^2(\tau,t) = \int_0^{\pi}[s_1^2(x,\xi_n,\tau,t) + s_2^2(x,\xi_n,\tau,t)]dx = -\frac{\partial s_1(\pi,\xi_n,\tau,t)}{\partial\lambda}\cdot s_2(\pi,\xi_n,\tau,t).$$

Using these equations, we have

$$y_{n,2}^2(\pi,\tau,t) - y_{n,2}^2(0,\tau,t) = \frac{s_2^2(\pi,\xi_n,\tau,t) - 1}{c_n^2(\tau,t)} = -\frac{s_2(\pi,\xi_n,\tau,t) - \dfrac{1}{s_2(\pi,\xi_n,\tau,t)}}{\dfrac{\partial s_1(\pi,\xi_n,\tau,t)}{\partial\lambda}}. \qquad (15)$$

Substituting the expression, we will have

$$s_2(\pi,\xi_n,\tau,t) - \frac{1}{s_2(\pi,\xi_n,\tau,t)} = \sigma_n(\tau,t)\sqrt{\Delta^2(\xi_n) - 4}. \qquad (16)$$

From (15) and (16) we deduce

$$y_{n,2}^2(\pi,\tau,t) - y_{n,2}^2(0,\tau,t) = -\frac{\sigma_n(\tau,t)\sqrt{\Delta^2(\xi_n) - 4}}{\dfrac{\partial s_1(\pi,\xi_n,\tau,t)}{\partial\lambda}}. \qquad (17)$$

Using the following expansions

$$\Delta^2(\lambda)-4=-4\pi^2\prod_{k=-\infty}^{\infty}\frac{(\lambda-\lambda_{2k-1})(\lambda-\lambda_{2k})}{a_k^2},\ s_1(\pi,\lambda,t)=\pi\prod_{k=-\infty}^{\infty}\frac{\xi_k-\lambda}{a_k},$$

where $a_0=1$ and $a_k=k$ at $k\neq 0$, equality (17) can be rewritten in the following way:

$$y_{n,2}^2(\pi,\tau,t)-y_{n,2}^2(0,\tau,t)=2(-1)^n\sigma_n(\tau,t)h_n(\xi). \qquad (18)$$

Here we have also used the equality

$$sign\left\{-\frac{\pi}{a_n}\prod_{\substack{k=-\infty\\k\neq n}}^{\infty}\frac{\xi_k-\xi_n}{a_k}\right\}=(-1)^{n-1}.$$

Substituting expression (18) to the identity (14) we derive (7).

If we replace the Dirichlet boundary conditions with periodic $y(\pi)=y(0)$ or antiperiodic $y(\pi)=-y(0)$ boundary conditions, then instead of the equation (14) we have $\dot{\lambda}_n=0$. Hence, the eigenvalues λ_n, $n\in Z$ in the periodic and antiperiodic problems do not depend on the parameter t. **Theorem is proved.**

Corollary 1. Considering the trace formula

$$q^2(\tau,t)+q_x(\tau,t)=\sum_{k=-\infty}^{\infty}\left(\frac{\lambda_{2k-1}^2+\lambda_{2k}^2}{2}-\xi_k^2(\tau,t)\right),$$

$$q(\tau,t)=\sum_{k=-\infty}^{\infty}(-1)^{k-1}\sigma_k(\tau,t)h_k(\xi(\tau,t)) \qquad (19)$$

system (7) can be written in closed form.

Corollary 2. This theorem gives a method of solving the problem (1) - (3). To do this, first we find the spectral data λ_n, $\xi_n^0(\tau)$, $\sigma_n^0(\tau)$, $n\in Z$ of the Dirac operator corresponding to the potential $q_0(x+\tau)$. Further, by solving at $\tau=0$ the Cauchy problem (7)-(8) we find $\xi_n(0,t)$ and $\sigma_n(0,t)$, $n\in Z$. From these data, we find $q(0,t)$. Thereafter, we substitute the expression $q(0,t)$ for the equation (7), and, and by solving the Cauchy problem for an arbitrary value τ we find $\xi_n(\tau,t)$, $\sigma_n(\tau,t)$ $n\in Z$. On the trace formula (19) we define $q(x,t)$.

Corollary 3. Using the results of [11] we conclude that if the initial function $q_0(x)$ is a real analytic function, then the solution $q(x,t)$ - is a real analytic function of x.

Corollary 4. If the number $\frac{\pi}{2}$ is an initial period of the first function $q_0(x)$, then all the roots of equation $\Delta(\lambda)+2=0$ are two-folded. Since Lyapunov function corresponding to the coefficient $q(x,t)$, coincides with $\Delta(\lambda)$, then on

Borg's inverse theorem ([12], see.), the number $\frac{\pi}{2}$ is also the period for the solution $q(x,t)$, by the variable x.

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UDC: 666.3.017

SIMULATION OF PARAMETERS OF nGe- $pSi_{1-X}Ge_X$ DIODE STRUCTURES ON TCAD SENTAURUS

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Abstract. In this article the parameters of $pSi_{1-x}Ge_x$ solid solution was simulated by using TCAD Sentaurus program. The gap dependence on composition of solid solution was carried out. A current-voltage characteristics of the structure was simulated at different composition as well as at different carrier concentration in the film.

Аннотация. Бу мақолада, $pSi_{1-x}Ge_x$ қаттиқ қотишмалар ва улар асосидаги диод структураларнинг параметрларини моделлаштириш амалга оширилган. Synopsys TCAD (Technology Computer Aided Design) Sentaurus дастуридан фойдаланиб, қаттиқ қотишманинг ман қилинган зона кенглигининг таркибга боғланиши, шунингдек, гетероструктура вольт ампер характеристикасининг қатламдаги заряд ташувчилар концентрацияси ва таркибга боғланиши моделлаштирилган.

Аннотация. В этой статье проведено моделирование параметров твердых растворов $pSi_{1-x}Ge_x$ и диодных структур. С использованием приборно-технологического моделирования Synopsys TCAD (Technology Computer Aided Design) Sentaurus получена зависимость ширины запрещенной зоны от состава твердого раствора. А также моделирована вольтамперная характеристика структуры от состава и концентрации носителей заряда в пленке.

Key words: solid solution, heterogeneous junction, band gap energy, molar composition, impurity, carrier concentration.

Калит сўзлар: қаттиқ аралашма, гетероўтиш, тақиқланган зона кенглиги, моль таркиб, легирловчи аралашма, заряд ташувчилар концентрацияси.

Ключевые слова: твердый раствор, гетеропереход, ширина запрещенной зоны, мольный состав, легирующая примесь, концентрация носителей.

Introduction

Typically for creating heterojunction the materials with identical lattice parameters are selected. In reality, it is practically impossible to choose up a couple of different semiconductors, with the perfect ideal coordination and crystalline structures as well as thermal expansion coefficients. Therefore, on the heterojunction border typically are arised mechanical stresses that cause the appearance of misfit dislocations, creating at the interface boundary condition. In

this connection solid solutions are used to create heterojunction structures. For example, Ge replacement in heterostructures with a $pSi_{1-x}Ge_x$ solid solution, reduces the stress at the interface to the level that excludes the possibility of plastic deformation of GaAs, and improves the characteristics of the heterojunction, where the reverse current is dramatically reduced.

Device-technological simulation system - TCAD Sentaurus designed for computer modeling of technological route of manufacturing various semiconductor multidimensional structures and for simulation of their electro-physical parameters and characteristics.

The simulation based on physical descriptions used in TCAD software tools, enables a preliminary analysis of the characteristics of electronic components and optimizes their structure and manufacturing technology. Using of TCAD software provides a cost reduction in semiconductor manufacturing to 40% by reducing the number of experiments and time spent.

The main goal of this work is a modeling parameters of $pSi_{1-x}Ge_x$ solid solutions and diode structures based on using a device-technological TCAD simulation system.

As it is known, silicon - germanium solid solution is being obtained as very widely used material for preparing RF devices and integrated circuits. The properties of solid solutions based on SiGe devices allow creating the device with parameters better than devices based on GaAs-basis. However, their cost is much lower than GaAs and all the tried and tested production processes for Si and SiGe is applicable.

Statement of the problem and simulation results

With the change the molar composition x in $pSi_{1-x}Ge_x$ solid solution its lattice parameters and band gap changes that allows to control their electrical and optical parameters. Therefore, the study of the band gap $pSi_{1-x}Ge_x$ of the composition is practical importance. In the experiments, usually this relationship is determined by optical methods by the determination of the absorption coefficient of the material. The experimental dependence of the band gap $pSi_{1-x}Ge_x$ of the composition are defined, for example if x = 0 then $E_g = 0.72eV$ and in the case of x = 1 it is $E_g = 1.2eV$ [1], that fully corresponds to the width of band gaps of germanium and silicon, respectively.

Since the experiments require a significant investment it is worth modeling parameters of solid solutions $Si_{1-x}Ge_x$ on the composition of the material. We have modeled some parameters of the solid solution $pSi_{1-x}Ge_x$.

Modeling process flow of the heterojunction in TCAD software system begins with the definition of geometrical parameters of the diode structure. For creating the diode structure it is necessary to optimize the parameters of the grid. The high density of the grid increases the accuracy of simulation in doping profile regions of the diode on which depends its electrical parameters.

The next step for constructing the diode structure is to initialize the region of the substrate, to determine its coordinates, the number of nodes, the doping concentration in the substrate and its orientation. In our case, for obtaining nGe-

$pSi_{1-x}Ge_x$ diode structure it is used Ge substrate which is doped with different concentrations of phosphorous.

Following device-technological simulation enables to determine its electrical parameters, which can be judged on how much it is precisely and correctly formed diode structure and developed the technological route.

Initially, it was simulated band gap solid solution $pSi_{1-x}Ge_x$ as a function of the composition x. The results of simulation are shown in Fig. 1.

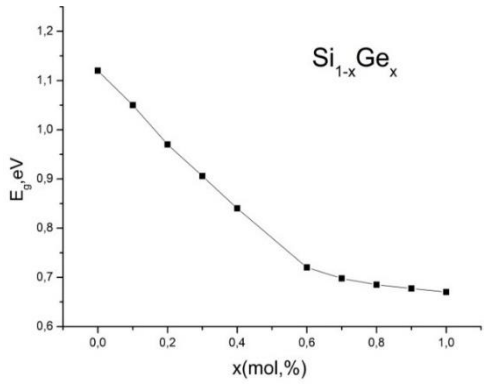

Fig. 1. Graph of the relation of the band gap $E_g=f(x)$ with the solid solution on the composition $Si_{1-x}Ge_x$.

It should be noted that the obtained relation is fully consistent with the data of [1,3]. As shown in the graph, the overall shape of the curve up to x = 0.6 is somewhat steeper than for the subsequent values of x. This is probably due to a significant change in the band structure of SiGe binary system at this composition.

We also modeled the RF diode structures nGe-$pSi_{1-x}Ge_x$for the composition x = 0.3 at different concentrations of doping: $n_1 = 10^{17}cm^{-3}$, $n_2 = 6x10^{17}$ cm^{-3} and $n_3 = 1.1x10^{18}cm^{-3}$. Where the carrier concentration in the substrate Ge is $n = 10^{17}cm^{-3}$. The results of simulation are shown in Fig. 2. As it can be seen with increasing concentration of impurities in nGe-$pSi_{1-x}Ge_x$ diode structures current saturation is significantly increased.

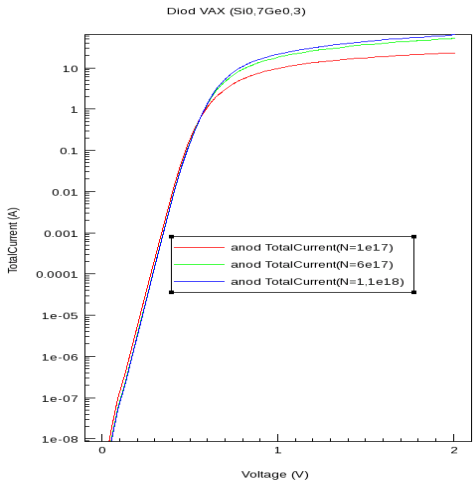

Fig.2. RF diode structures nGe-$pSi_{1-x}Ge_x$for the composition x = 0.3 at different concentrations of doping: 1- $n_1=10^{17}cm^{-3}$,2- $n_2= 6x10^{17}cm^{-3}$ and 3- $n_3=1.1x10^{18}cm^{-3}$

We have also modeled the RF diode structures nGe-p$Si_{1-x}Ge_x$ with different compositions of the solid solution at a concentration of carriers in the substrate Ge is $n_{Ge} = 10^{17}cm^{-3}$ and for p$Si_{1-x}Ge_x$ is $n_{SiGe} = 10^{17}cm^{-3}$. The results of the simulation are shown in Fig. 3

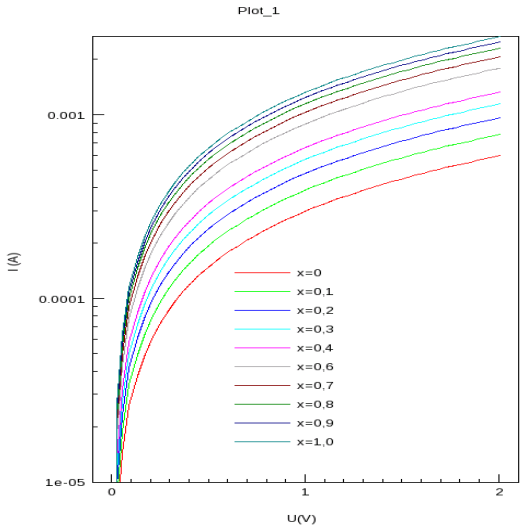

Fig.3. The current-voltage characteristics of the diode structures nGe-p$Si_{1-x}Ge_x$ with different compositions of the solid solution at a concentration of carriers in the substrate Ge is $n_{Ge} = 10^{17}cm^{-3}$ and for the film p$Si_{1-x}Ge_x$ is $n_{SiGe} = 10^{17}cm^{-3}$

As the figure shows an increase in the percentage composition x in the nGe-p$Si_{1-x}Ge_x$ diode structures will lead to a significant increase in the saturation current value.

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UDC: 911.3 (575)

PERIODIC FEATURES OF TERRITORIAL ORGANIZING OF INDUSTRY PRODUCTIONSTRENGTH

Ruzmetov D.R. (UrSU)

Abstract. This article describes the periodic aspects of theoretical and practical achievements in the development and deployment of industrial production and theire introduction to the practice.

Annotatsiya. Mazkur maqolada sanoat ishlab chiqarishini rivojlanishi va hududiy tashkil etilishi borasidagi nazariy va amaliy yutuqlar hamda ularning amaliyotga joriy etilishining davriy jihatlari ko`rib chiqilgan.

Аннотация. В данной статье рассмотрены периодические аспекты теоретических и практических достижений в развитии и размещении промышленного производства и внедрение их в практику.

Keywords: industry, district combine, TPC, cluster, territorial organization of production.

Калит сўзлар: саноат, район комбинатлари, ҲИЧМ, кластер, ишлаб чиқаришни ҳудудий ташкил этиш.

Ключевые слова: промышленность, районные комбинаты, ТПК, кластер, территориальная организация производства.

At the beginning of the 19th century the appearance and development of industry in Europe caused sharply increasing of the level of production and exchange of goods. Freer location in the territory and rapid development of industrial enterprises compared with the former condition caused the increase in the amount of compression products, changes in supply and demand due to the difference between the second and led to the global crisis. During this period, the largest industrial areas were formed as the Black England (GB), Ruhr (Germany), Lorraine (France), Pennsylvania (USA). Production, exports and capital investment increased focus established, international companies began to be formed, and these, in turn, intensified competition in the global market, and comfortable place to carry out research on the effective use of resources. The German economist Alfred Weber's work "About Industry Standard" published in 1909 is the first product of research in the above processes.

Weber's attention was focused on the factors affecting the placement of industrial production. He classified the factors according to their influence and identified the main determining factors and compiled them being based on the ability to contain them. For example, he combined the cost of transportation with raw materials and fuels; he considered that the rent does not affect the position of the enterprises in the first period and separated the two factors – standard

transportation and workforce which mark production force. He shows the default position of the company or the company's point of optimal location and creates its mathematical models [2].

A. Weber later formed a factor named “sintering” in connection with the production relations arising in the process and highlights that land rent increases at the territory of the company in connection with it. He included the phenomena like theory of standard, the factor of locating, and the effectiveness of sintering into a scientific treatment. The factor of sintering or its effect is not the result of embodiment, i.e. the consolidation of the enterprises, but it is gained in the process of specialization and cooperation of enterprises. A. Weber’s work “About Industry Standard” was translated in the 20th of the last century and was one of the theoretical bases of the development of the planned economy during the former Soviet period. At the introduction part of the work a famous economic geographer N.N. Baransky says, “The establishment of the regional industry can solve all the problems only by the theory of Weber, and there is no need to discuss”.

In the former Soviet period, because of the planned development of country's economy particular attention was paid to production forces, the factors of production. Ideas and concepts as “Regional complexes”, “regional industrial complexes”, “energy production cycles” were put forward, containing forms of social organization of the forces of production, specialization, study of combination and cooperation issues were deeply researched.

In the 20s of the last century I.G. Aleksandrov participated in the design of large-scale power stations in various regions of the USSR and stressed the need to build the district combines, then, regional production complexes (RPC). In 1947 his successor N.N. Kolosovsky put forward the idea of regional production complexes (RPC).

On the basis of these two famous scientists’ ideas new regions were mastered in the country and production facilities were organized. Southern Tajikistan (hydro energy + aluminum industry + electronics industry), South Kazakhstan (mining (phosphate) + chemical industry), Mangistov (oil industry + chemical industry + fertilizer industry) and other RPCs can be examples to it [4].

During the former Soviet process and later a number of scientists as N.T. Agafonov, M.K. Bandman, T.M. Kalashnikova, A.T. Xrushev, M.D. Sharigin. K.N. Bedrintsev, Z.M. Akramov, O. Abdullaev, Q. Abirqulov, A. Ro'ziev, O.B. Otamirzaev, A.S.Soliev, A.M.Sodiqov contributed to the development of RPC theory. At the end of the last century and the beginning of the 21st century, the countries of the CIS began to study the issue of regional clusters.

In the 70s of the last century regional clusters, started being built in the world's developed countries in various sectors of the economy. The first clusters rose on the basis of companies and organizations as scientific research institutions (Silicon Valley, USA), information and communications (Nokia, Finland), automotive (Toyota, Japan). Differing from RPCs clusters express high level of embodiment of the relations of different directions, scientific research institutes,

design bureaus, as a condition of the development of the parks were formed on the basis of their making.

The main condition of increasing competition in the international market, developing countries try to find their place in the system of high-tech and capital trans nationalizing, multinational companies come out development of the postindustrial society caused the development of science and technology, formation of regional clusters.

Aspects of the development of regional clusters and their development features were studied by a number of scientists as J. Harrison, R.Sabela, M.Porter, S.Bekatti, E.Bergman, L.Yang, S.Sokolenke.

Deep research is being carried out in a number of scientific research institutes and institutions as the European Cluster Observatory, the Harvard School of Business, Samsung Economic Research Center, Russian Cluster Observatory, the University of Hokkaido, Kitakyusyu park.

The analysis shows that clusters are actually evolutions of free market, industry standards, RPC, energy production cycles.

It is very actual to activate regional clusters in the different directions of our Republic at present, since nowadays is the fastest-growing and lucid competitive in the world market and the global financial system has become a basic requirement for finding their place in the current period.

In our republic the gross domestic product, and 1/4 portions of the agricultural sector, the main corresponds to the production of light industry raw materials.

Light industry and food industry meet the demand for consumer goods in the primary sectors of the population, the large availability of raw materials and the labor force was the need for the establishment of the first regional clusters in these areas.

Figure 1. The components of the cluster

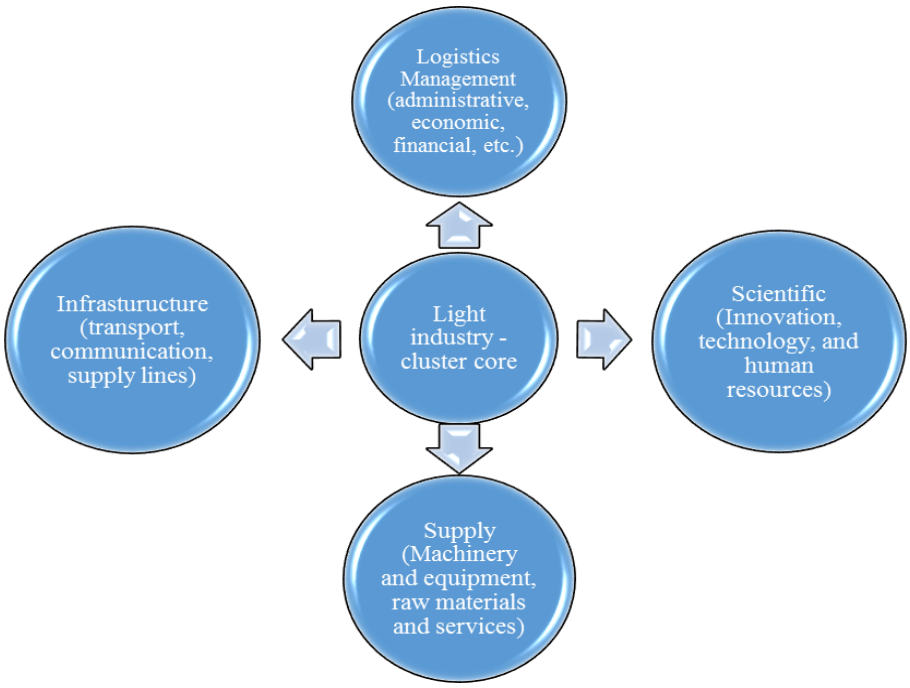


Figure prepared by the author

This, in turn, requires coordination of the activities in the area which is related with network industries and the economic, financial, organizational and other areas. Particularly, it is necessary to form a single logistics system covering components in the field of education (innovation, cadre), finance (banking and finance), economy (management, marketing, etc.), corporative supply (machinery and equipment, raw materials, components, packaging materials), infrastructure (transport, communications and software lines, etc.). (Figure 1).

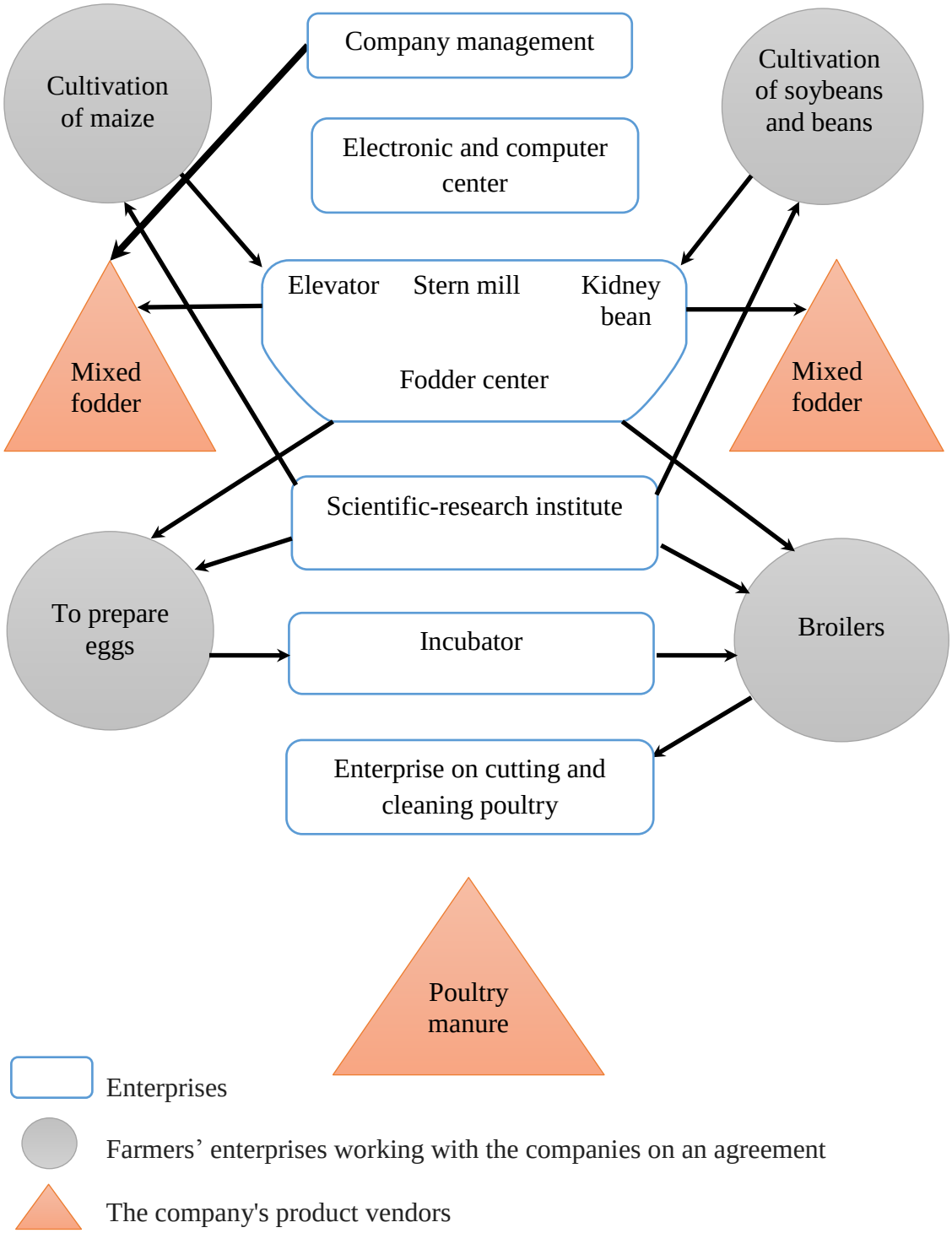
Industrial Cluster's simplified scheme appears as shown above. The establishment of production units in this scheme is synchronized with large and small RPCs established in the former Soviet Union and the United States and agricultural firms. (Figure 2).

Figure 2. US agricultural system, relations between enterprises and farmers [3]

Regional mechanisms and organizational aspects of US agro firms and the post-Soviet agro industrial complexes (AIC) were very close to each other. However, market-based mechanisms of economy, competitive environment provided innovation and continuous development of the early countries (but not always).

Although regional clusters of the new century are very popular today, there are special differences in organizing them. In particular, in the scientific development of clusters some models were created which were based on the principle of internal and external competition (USA, Australia, Great Britain, and Finland) and the state actively participate in the activities of them (Japan, Republic of Korea, Sweden, France, Italy, China, Russia). The last of these models is considered as an acceptable variant in the current development period of Uzbekistan. Because the mechanism of state controlled market at a certain extent is justified in the stage of development of more than a quarter of a century of independence. Especially during the economic crisis that began in 2008, not only withstanding the collapse of the economy, but maintaining sustainable development of our country can be an example to this.

In the field of light industry of the Republic goods are being produced which are somehow competitive in the world arena. There is a system to provide qualified personnel in the sector. In some of the sectors of light industry (cotton) there was formed an enterprise supply chain manufacturing machinery and equipment, a small amount of the chemical units (artificial fibers and synthetic yarn). However, the relationship between scientific research institutions and production companies in the industry is not the level of demand of cluster, chemical dyes and fibers, synthetic yarn, sewing a large part of raw cotton fabrics imported from abroad.



The experience of the application of the above operations in a variety of industry show that it is necessary to introduce cluster practice for the future development of the light industry in our Republic where there are the largest light industry raw materials, labor, cheap energy resources. The mechanisms which regionally organize the production is becoming developed in the scientific, informational and innovational spheres, but its regional establishment factors are maintaining their effectiveness.

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UDC: 631.8.631.23.

RESTORATION OF FERTILITY OF DEGRADED SOILS

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Ruzmetov R. (UrSU)

Abstract. The article highlights the impact of rhizobacteria tropical leguminous plants – the restoration of indigo and convicted fertility of degraded soils Khorezm region.

Annotatsiya. Maqolada dukkakdoshlar oilasiga kiruvchi tropik ekin Indigofera ildizidagi rizobakteriyalarning degradatsiyaga uchragan Xorazm viloyati tuproqlari unumdorligini tiklash va yaxshilashga ta'siri yoritilgan.

Аннотация. В статья освещаются вопросы влияния ризобактерий тропических бобовых растений – Индигоферы на восстановление и увеличение плодородия деградированной почвы Хорезмской области.

Key words: Indigo, degradation, rhizobacteria, bacteria of tubers, fertility of soil.

Kalit so'zlar: Indigo, degradatsiya, rizobacteriya (azot to'plovchi bacteriyalar), tuproq unumdorligi.

Ключевые слова: Индиго, деградация, ризобактерия (азотонакапливащие бактерии), плодородие почв.

As we know, in recent years natural fertility of soil has declined and the period and condition to restore it is limited so that changing of farming system, diversity of plant structure and change of global climate had affected on natural process in soil layer. Therefore, soil degradation is frequently occurring. In such cases, scientists are more responsible for improving researches in order to solve those problems, restoring soil fertility and using research theories in practice.

Several agro-technical methods of improving soil fertility, in agriculture, have been applied into practice so far. However, recent problems in livestock sector are being caused to considerably decrease of areas in crop planting system and volume of the accumulation of manure. In such cases, it is a core issue to test different ways of restoring the fertility and putting into practice.

One of economic and environmental fruitful methods of improving soil fertility that is to sow leguminous plants between crops in main planting areas has not fully supported, though it is a proven experience.

One of the biological methods of improving fertility is to increase bacteria which assimilate nitrogen from atmosphere in the roots of leguminous plants in soil and to infect them to the roots of fruit seeds.

In 2006, Urgench State University researchers grew up and acclimatized a famous tropical plant named Indigo tincktoria which have natural indigo in local saline soil condition in region. By the method of personal choice, the sort Feruz 1 was deseeded which fits to local saline soil condition.

The Indigo belongs to leguminous plants and its root contains symbiosis rhizome-bacteria which assimilating nitrogen. The shape and size of bacteria tubers is bigger than bacteria in the roots of alfalfa.

The features and methods of infecting to other crops of the bacteria have not completely researched. Likewise, scientific sources have rare information on this. Taking into account those, since 2012 features of rhizome-bacteria in the root of this plant and experiences of infecting experiments to other crops had carried out in degraded saline soil of Khorezm region (Academic experimental department of Urgench State University). Freda nutrient (sugar and glucose -10.0g, KH_2PO_4 0,5g, $MgCO_3$-0,2g, NaCl 0,1g, $CaCO_3$-3g boiled pastries) were mostly used for separating bacteria.

Growth of grey colonies from bacteria observed which sown in abovementioned condition, in laboratory environment. After 4-5 days it was observed that cells of colonies had grown in the shape of stick and prepared to be infected to the roots of other plants. Having prepared water liquid in place of 400.000 bacteria in 1ml suspension, apricot seedlings infected steeping in it and sown in field (picture 3). Indigo seeds were sown between seedling lines as well.

During constant observations, when samples of soil and root, in mid-June white and pink tubers formation observed. They gradually turned into black in mid-August. According to scientific sources, white tubers are not active bacteria, and when they turn pink or red they become active. According to scientific sources, formation of leguminous plants depends on soil condition. An increase of the amount of nitrogen in the soil leads to reduction of tubers. On the contrary, if there is a lack of nitrogen, bacteria infect to the roots of plants and tubers forms. Apart from, soil salinity, lack of moisture makes tuber-formation slow.

In laboratory, virulent stamps can be taken by increasing virulence (infectious feature to root system) of bacteria. As we reckon that Indigo roots contains bacteria living in symbiosis and they can form tubers in salinity and drought condition.

Experiences showed that growth grade of seedlings increased and in autumn collection of bacteria was observed in the roots of Indigo which sown between lines in orchard. In the next year, intensity in growth and development of the apricot seedlings observed. These may be to evaluate as positive effect of infected bacteria to roots of Indigo and apricot.

Therefore, in accordance with our aim, these bacteria separated in laboratory and made stamps of the most active bacteria, which have a high virulence. It is important to create stamps of such microorganisms on path of improving condition of saline and degraded soil and enhancing the fertility feature so that the Indigo can grow in saline soil.

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UDC:94.575 (338.966)

THE HISTORICAL PLACE OF KHOREZM REGION IN CIVILIZATION OF NEOLIT COMMUNITY IN MIDDLE ASIA

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Annotation. The article concerns the historical place of Khorezm region during the Neolithic era in Middle Asia.

Аннатоция. Мақолада Ўрта Осиё неолит даврида Хоразм воҳасининг тарихий ўрни қараб чиқилган.

Аннатоция. В статье рассмотрен вопрос об историческом месте Хорезмского оазиса эпохи неолита Средней Азии.

Key words: Middle Asia, Khorezm oasis, Amudarya, Syrdarya, late Stone Age, Kalta Minaret.

Калит сўзлар:Ўрта Осиё, Хоразм воҳаси, Амударё, Сирдарё, неолит, Калтаминор.

Ключевые слова:Средняя Азия, Хорезмский оазис, Амударья, Сырдарья, неолит, Калтаминар.

Khorezm region is situated in the north-west part of Central Asia and known as the center of ancient agriculture. The region regarded as natural-economical source because there occured ethnic and ethnologic relations. Low Amu Darya basin connected the population of East and the West, the North and the South, and situated in the international caravan so most tribal community clans settled down, joined into the neighbour territory, provided the different structure of tribal coexistence, so they had change to organize centralized state. This process especially, this process activated during the neolit age, known as the result of geographic researches, 25-10 mln years ago the result of Amudarya and Syrdarya was a wide plain[1].

The last stoneage Ustyurt territory of Karakalpakistan Republic and mountain of Sultan Uvays of Khoresm region appeared as ethnic place. Social and economic and cultural relations during the neolit age in CentralAsia divided into 2 poles.

The first pole: Southern zones were Koppetdag mountain of Southern Turkmenistan and the Basin of Murghab River.

The second pole: Because of geologic and geographic conditions and antropogen landscape, Khorezm region was distinguished from other historical and cultural region of CentralAsia. The geographic positions and natural conditional aspects of the region were reflected by ethnic appearance, living places and financial and moral cultures of our ancestors. At the result of archaeological

[1]Баратов П., Мамбетуллаев М., Рафиқов А. Ўрта Осиё табиий-географияси. – Тошкент: “Ўқитувчи”, 2002. – Б.283.

researches in the early neolitage, Low Amudarya, Sarikamishbuyi and the territory of Uzboy were acquired by mankind (VI-V thous. years).

In the Sultan Uvays mountains, the new descendant of "buries", who were hunter, didn't come across the foodstaff problems, so they didn't have to search new natural economical places into their daily life (at the beginning of B.C IV thous years). The members of Burle-3 clan who lived, had a living necessity to search a lot of new territory. Jonbasqal'a fortress was situated the eastern side of Sultan Uvays of the right side of Amudarya. The road and wide fields which existed between the movable sand around the fortress, the water of Okdarya tributary which separated from at the result of Amudarya' tide, altered them into many basins. At the beginning of B.C IV many basins which situated in the north-east territory of Jonbosqal'a owned different economical source and their coast changed into reed-bed and jungle. The Basins which owned antropogen lanscape and economical source were noted historical date "Lateness hunters" of new descendant who came from, Sultan Uvays settled down, determined their jobs and marked their next future. The financial and spiritual culture of neolit trible community of Okdarya basin occupied the term of "Kaltaminar culture" in history science[1].

Early financial and spiritual cultures of Kaltaminar were illuminated and took the cultural layer of Jonbos-4, the place of Talstov, Kuginak-22, 195, 198, Bolaeshi-9. Early Kaltaminar people could do some skills at handicraftsmanship, pottery, creating new stone and bone household items. Mud dishes were made by hand the mixture of pure soil, some sand and sea-shell. They made jar, deep and wide bowls, scoop but shapes of dishes were different from each others. The symbols like ship were bought much. The wall of dishes was drawn ear, broken lines and to down and horizontal lines. Early "Kaltaminarids" used weapons which made flint, quortzit leaflike bows, and sharp knifelike weapons, scrapers in their household. For semi-basement places they used plants.

Trible community of early neolit age's history connected to the late of B.C V and middle of B.C IV ages, this historical date noted as middle neolit[2].

The generation of "lateness hunters and conbineders" who in low Okdarya basin settled down to Tuyamuyin around the left side of Amudarya, Sarikamish and territory of Uzboy, existent basin which situated in the last stage of neolitage.

At the result of archaeological researches, dense situating of trible community occurred Kaparas region where situated Okchadarya and Tuyamuyin (Karrikizil, SultanSanjar, Kushbulak)[3].

New cultural conditions of lost Kalteminarids are clearly seen in pottery dishes. The decorates of dishes drown from top up to bottom, the shapes of horizontal, crooked-deep places, and the shapes of triangle can be seen.

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[1]Толстов С.П.Древний Хорезм. – М.: «Наука», 1948.: Виноградов А.В. Древние охотники и рыболовыСреднеазаитского междуречья.ТХЭ,Т.XIII.–М.: Наука,1981.

[2]Толстов С.П.Древний Хорезм. – М.: «Наука», 1948.: Виноградов А.В. Древние охотники и рыболовыСреднеазаитского междуречья.ТХЭ,Т.XIII.–М.: Наука,1981.

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In labour instruments triangle bullets were merely seen and the remnant of copper awl proves that “kaltaminarids” found cattle-raising as a job.

So we can come to a conclusion by looking through historical information which stated above.

It’s clear from historical information, as the comfortable geographic conditions and antropogen lanscape, from Zaungiri Karakum to Southern coast of Aral Sea, was ready for household.

At the result of archeological researches of Middle Asia, neolit age videly showed settling down of trible community. The aspects of settling down of neolit tribal community were: in front of Kapetdag, Khisor region in Tadjikistan, Ferghana region, created basins by river of dam “Tuyabog’iz”, territory of low Zarafshan, basin of low Amudarya.

Early “Kaltaminarids” their new generations used household traditions atgeographic aspects, uncomfortable conditions and whining of Amudarya, they added their portion to developing of neolit community of Central Asia.

Our ancestors had a special knowledge and practice of labour to creat labour weapons, do household directions, built new places, we also emphasized that they had a special place in economical developing of neolit community in Central Asia.

UDC: 39(575.1).009

IDEAS ABOUT PECULIARITIES OF JEWELRY IN KHOREZM OASIS

RakhmanovaY. (UrSU)

Annotation. Types of women’s jewelry of daily wearing, their method of preparation and religious imaginations of patterns of decorations were analyzed in this article. Special features of Khorezm in the decorations were illuminated.

Аннотация.Мазкур мақолада XIX аср охири XX аср бошида аёллар кундалик ҳаётида тақилган заргарлик безаклари турлари, уларнинг ишланиш услублари, безаклар билан боғлиқ диний тасаввурлар таҳлил қилинган. Безаклардаги Хоразмга хос алоҳида хусусиятлар ёритилган.

Аннотация.В данной статье дано описание женским украшениям конца XIX начало XX века, их видам, методам (способам) изготовления, религиозным представлениям, связанным с украшениями. Освещены (отмечены) особенностисвойственныеХорезму.

Key words: Women, daily life, decorations, jewelery, “jig`a”, “Shavkala” bracelets of Khiva, cart, golden, silver.

Калит сўзлар: Аёллар, кундалик ҳаёт, безаклар, зеб-зийнатлар, “жиға”, “Шавкала”, Хива билагузуклари, , аравак, олтин, кумуш.

Ключевые слова: Женщины, повседневная жизнь, украшения, орнаментальный, подвеска, хивинские браслеты, колесница золото, серебро.

The ancient people applied art are very significant in studying the history. For instance, the diversity of women’s jewelry, the decorations were not only the

presentation of love, respect and kindness to them but also they are considered as the valuable source for us to study the history.

These pieces of art inform us about the period of time and place, professional skills of master designers, also, economic and spiritual state of the owners of jewelry, sentiment, inter relations of social classes, in general, social, mental, economic, even political scene of the certain period. In 19th century, the Khivian jewelers' profession developed dynamically. Jeweler s profession developed dynamically. Jeweller's polished gold, silver items with delicate stones and glass.

In 18th century sixties, there were 12 jewelers in Khiva, at the beginning of 19th their number increased to 60[1]. There were separate jewelers inhabiting places in Khiva who dwelt by making jewelry. Jewelry were made of gold, silver, bronze, cuprum and polished with gold-bearing water. The precious stones such as pearl, emerald, color glass, onyx were used. These precious stones were brought from India, Iran, Egypt and other countries. Local people considered each stone acquiring magic feature and believed that they would bring happiness, solidarity, protect from evil spirits, and even some stones were believed to strengthen the heart, and cure from certain disease.

Jewelers used national-traditional techniques in designing jewelry items.

Saber Khan of Khiva

In Khivian jewelry designing, such creative methods as pressing, tinning, stone fastening, fine designed "shabaka" were widely used.

In decorations ornaments with chain, beads, stone and in the shape of metal pressed leaves (usually on head wearing of local people preserved up to the 20th century) were mostly used, "pomegranate seeds", "apple blossom", "round patterns" were designed[2].

In Ichan-kala museum preservation about 200 Khorezmian jewelry items have been preserved up to nowadays. There were several groups of women's jewelry which were worn on head, breast and waist. One of the items of head jewelry was "tumor" (amulet) which was hooked on takhiya (skull cap). The word "tumor" in Uzbek originated from Arabic "duo" (means to pray to God, wish for a good outcome). Usually a chapter from Quran was written on a piece of paper and put into "tumor" in order to protect a person from evil eyes and troubles. Silver and

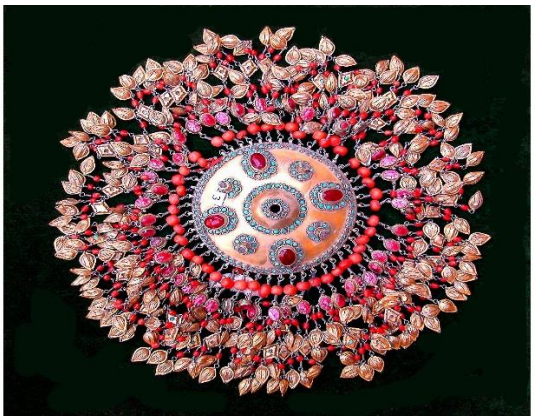
[1]Абдурасулов А. Хива. (тарихий-этнографик очерклар). – Тошкент: Ўзбекистон, 1997. – Б.70

[2]Ҳакимов А., Оқилова К. Амалий санъат // Хива – минг гумбаз шаҳри. – Тошкент: Шарқ, 1997. – Б. 82

turquoise or “feruza” were used to decorate “takhya” and jewelry was polished with golden water. The peculiarity of Khorezmian skull caps (takhiya) is that its top surface is flat and designed with ribbons, and with circumference. The “takhiya” was decorated with gold, silver and cuprum scales and “huyi par” (eagle owl’s feather) on one side only.

“Osma duziy” or “wing hang” was an ornament worn on forehead which contained three teeth of wild animals. “Osma duziy” which has been preserved in Ichan-Kala museum fund belonging to the 19th century had coral, turquoise designing stone patterns[1].

“Takhiya Duziy” is the complex of Khorezmian jewelry designing peculiarities.



“Takhiya Duziy”

It covered the skull cap totally; these covering metals (mostly scales were fastened) took the shape of cap naturally. The head decorative item “djigha” was the symbol of ruling power or governor of the country. In “Chronology of Khorezmian shakhs” the scriber Bayoniy wrote the following lines “Amir Tura came to Filhol Ark and became Khan and wearing a fur-hat with djigha, sat on the throne”[2]. The term “Djigha” was connected with the symbol of bird. The birds were always considered as the symbol of governors and his patronage, and defender[3]. Besides, the primitive beliefs of local peoples traced its ancient history in jewelry. Owl, eagle-owl, eagle and falcon feathers were believed that they would protect people from evil spirits and devil.

[1]FundStateMuseum Reserve of Ichan - kala. КП 1141 инв укр. 50, 59 1166 инв,укр.71, КП 1168 инв укр.72.
[2]Баёний Муҳаммад Юсуф. Шажарайи Хоразмшоҳий /Мерос. – Тошкент: Камалак , 1992. – Б.217.
[3]Фахреддинова Д.А. Ювелирное искусство Узбекистана. – Ташкент, 1988. –Б. 89.

"Bodomoy and kalit boghi"

In eastern countries by wishing health and prosperity to the governor, on his headwear the "djigha" was hooked with the feather of a bird. But in Khorezmian shakh's crown or head wear there were no feathers it was simpler than others. But, djigha on women's and children's head wears were used with feather. On wedding day, djigha was hooked on girls' "takhiya's".

As a conclusion to our view point we would like to mention that the jewelry items have been preserved as the precious piece of history, also we must mention that nowadays a lot of youth especially girls and women are interested in the ornament, patterns of traditional design of the national jewelry.

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UDC: 371

THE ROLE OF SPIRITUAL VALUES IN THE LIGHT OF THE IDEA OF THE HARMONIOUSLY DEVELOPED PERSON IN THE EDUCATION PROCESS

Khajieva I. (Urgench branch of TUIT)

Annotation. This article discusses issues about expressing ideas of harmoniously developed person in our spiritual values.

Аннотация. Мазкур мақолада маънавий қадриятларимизда комил инсон масаласининг ифодаланиши тўғрисида мулоҳаза юритилган.

Аннотация. В данной статье рассматривается вопросы о выражении идеи гармонично-развитой личности в наших духовных ценностях.

Keywords:

Калит сўзлар: Комил инсон, маънавият, ахлоқ, глобаллашув, дин, қадрият, мерос, тасаввуф, билим, соғлом инсон.

Ключевые слова: Гармонично-развитая личность, духовность, поведения, религия, ценность, наследие, суфизм, знания, здоровый человек.

Ideological view of the world, which plays a very important role in the upbringing of the perfect man, increasingly gets more complicated in the process of globalization at unprecedented levels nowadays.

As a result of the dissemination of information with lightning speed Globalization naturally affects thorough change in every individual's life.

In this regard, a number of I.A. Karimov’s works like (“Uzbekistan on the way of deepening economic reforms”, “The aspiration of Uzbekistan to the 21st century”, “Uzbekistan on the threshold of the 21st century: the threat of security, conditions of stability, guarantees of the development”, “Without historical heritage there is no future”, “Faith in the strong will of our wise people”), speeches and responses to newspaper “Fidokor” and information agency “Turkistan press” reporters’questions had a thorough discussion.

While, upbringing of a comprehensively developed, well-educated, work-based on his understanding person is required to enhance his spirituality.

A spiritually enlightened person that embodies a set of moral and intellectual world of complex is a social phenomenon. To be exact, spirituality is an integral part of human activity, the heart of human consciousness is the product of intelligence reflected light in Truth.

As I. Karimov uttered spirituality is not a gift of fate. To developing the spirituality in the heart and faith, with understanding and intelligence indeed a person should work hard. Shaping spirituality on the basis of hard workcarried out in this process lies in spiritual heritage, in the history of country and in the history of religious values.

For this, through the information of spirituality high-spirited, educated, intelligent mancan be upbrought. All through the centuries, the concept of Perfect

Human time and his works have been described as the pinnacle of human perfection.

A Perfect Human includes all religious and worldly knowledge, and involves human spiritual and mental qualities, including his heart full of kindness; generous and enlightened man is a symbol of Ideals. Special attention is paid to the issue of human perfection mysticism.

Sufism truly humanitarian doctrine can not be an exaggeration if we say that. E. Bertels remarks without examining the literature of Sufism, we may not be able to understand the cultural life of Muslim East.

It is even difficult to comprehend the East itself without being aware of this literature. This is why the idea of a Perfect human in Islam purpose of the study in accordance with the teachings of Sufism reaches to its goal.

As the representative of the major doctrines of Sufism Ibn Al Arabiy remarked," The God created the mind from the divine mind and the shape of his image was reflected in the face of a Perfect Human. That's why, there is hadith as; the God created Man in the image of Rahman.Thus, Perfect Human includes the qualities of the Gods Rahmani Rahim, Symbol of Perfect Human is as the image of Prophet Muhammad. Because he possessed all mental, spiritual and secular knowledge Allah sees all his qualities only in a Perfect Human.

Thus, Only Perfect Human will be able to see Allah's Beauty, (in Sufism teachings are taught) thus, the source of all the beauty of the Best God. The shining face of Beauty is in the Power of existence, in the action of movement.

As well as, in the 35th versus, Nur'surah; Allah referred as the ray of skies and the Earth.Allah shows mercury on any random people [4].

According to the resources, Allah's ray is holistic delight, and directed into individuals.' The God can-send it in the storm of prophesy for prophesy, for saint in the shape of holistic, and for ordinary people in the form of ability and creativity, power as referred in Koran.

Therefore, in our ritual heritage, religion education; perfection specifically (mentioned) determined according to one's both external and internal beauty and dignity. It has been proven in the rest of hadiths like Allah does not consider your images and deeds, but your hearts and notions [7].

As we express as out perfect people, we need to refer that the great deal of attention to our religious and global-spiritual traditions is indirectly paid.

Additionally, the issues of moral pureness and spiritual perfection are clearly and brightly expressed by the invaluable creative works of our ancestors. For instance, our statesman like Farabi, Beruni, Ibn Sina, Yousph Xos Hajib and Alisher Navoi clearly expressed the relax of personal perfection.

In his, "Fozil odamlar shahri'', Farabi harmonized perfection with erudiction. What is important that, according to his minds the city of erudicts should be governed by morally-spirituallyelevated leader. Additionally, Farabi has presented 12 points of perfect governor:

– should be physically well- built
– naturally gentle and bright

– must have a strong memory
– should express his ideas clearly
Should have motivation to acquire knowledge and skill
– should be capable to hold himself from bad habits.
– should be honest, fair and truthful
– should appreciate humanity
– must not lead to materialism
– Naturally fair, contributor of kindness and should be merciless in any meanness.

Actually one's perfection can not be determined by learning and knowledge only, but also he\she should possess all the personal qualities. Merely by inhumane facilities one can earn reputation within public.

While the first President of Uzbekistan also gave feedback, he mentioned present alteration that every citizen should consider four procedures:

-should be open-minded and loyally learned
-should learn how to rely his/her knowledge and receive benefits for his deeds
-should run business in the harmony of both public and his benefits

Aspiration for perfection can guide a person to appeal courage. From this scale, Beruni's opinions easily absorb our attention. Act humanly will be limited by influence from a person's relatives and his\her condition. Only a kind person will recommend his\her possessions apart from conflicting with others.

With his\her honesty, gentleness, strong-willingness, tolerance and modesty will be well known among other, however he/she didn't come up from this layer, as a consequence he\she will take a sit at the top degrees. Hewill be respected for hisher qualifications, apart from his\her families' degree [5].

Ibn Sino appreciates personal qualities like justice, pureness, knowledgeable, decidedness, good wishes, generosity and vigor, while blame negative qualities including laziness, knavery, instigation, stealing, cowardice and slander. Scientist thinks that cleverness is energy that serves to avoid haste.

The perfection of individual is also mentioned in the work of Alisher Navoi, the sense of personal development is a base of Navoi's wise, and the scale of his spiritual perspectives. Magesty Navoi in his novel called ''Lisonut Tayr writes'', Four ingredients, seven skies and six sides-all of them consist the fundamental base of space. Humans are the greatest being among all creatures.

Realization of ourselves is the start of human perfection point out, Navoi:

Kamol et kasbkim, olam uyidin,
Sanga farz olmagay gamkok chiqmay,
Jahondin notamom otmak chiqmak,
Erur hammomdin nopok chiqmak

In order to understand the essence of rhyme, we need call as Ebrahim Haqqul said, open-minded person realizes the world. Realizing oneself is not determined by background. In deeper sense, recognizing process means getting rid of all bad qualities like passion greediness, defile and ignorance while developing positive feelings like motivation, consciousness, vigor and curiosity. The motivation towards perfection, realizing oneself can save people from meanness. If the

required facilities for personal perfection did not appear in one's heart and characteristics, he (she will never become a member of, Global village which is equal to having a bathroom, but not become pure Aziziddin Nasafy, who is well-known a candidate of imagination studies, that has explained it completely:

Animals of the globe show to the people, because in to the human kind there is perfect people are living. There is not more grandiose and wiser animals or creatures rather than humans.

So, the most majestic and wiser, exceedingly clever and pure morals through all people is their perfect one. Howevere these qualifications can not be easily appearing on people, achieving the highest degree requires being pure-hearted and mentally purify.

Therefore, according to present modern demand, we should train our children through with its all requirements, to make them necessary, perfect ones. Unawareness of true religious dogmas, nowadays – young people are detracting by diverse unknown and harmful ideas. For these reasons, it is an important factor that our young people should be thought worth our historical resources, historically developed religious heritages, which focused on human and its concerns. I.A. Karimov emphasizes that: Islam has spread and soaked in every aspect of our life. It is undeniable truth. Therefore, our national traditions have been alive through diverse periods'' [3].

Exactly to protect our youngsters we should form their spiritual face is more important. Our far ancestors have presented unique ethics Codex and it is a dream for others to achieve these degrees

,,When a person can be distracted, if he\she appreciated with beauty,miracle of words, forms of things and much more strange beliefs,'' – says. N. Komilov well as vice versa that when a person escapes from persuasions if he\she exceed his\her viewpoints and spiritual degrees''.

When our young generation realize the fact that Islam is not only a dogma, but education, then youngsters can be saved from dogmatism' 'disciplining the on the spirit of perfection, they only serve to spoil mental health of youth. It is our main duty to discipline children physically, mentally, spiritually healthy person.

While teaching higher education, using the notions that are described above in the subject of ''Bases of Spirituality'' is suitable. Especially, this consisted of arming student and youth with knowledge that created by medieval and central Asian public, disciplining them by giving vivid illustrations about scientists who contributed overall development of Islamic culture in order to rise sense of belonging and pride in the same base, glowing children that have national notions, resistance against strange ideas, obedient to their motherland, capable to perform all personal qualities, able to protect nation and peers from all negative and destructive notions,strains and bad habits. In this way students' patriotic, humanistic feelings, possessions of culture in the field of ecology and law, artistic and creativity skills that serves for the human perfection, and independency of family unit should be taken in to an account.

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UDC:822.512.133

ENSURING INTERETHNIC TRANQUILITY IN UZBEKISTAN IS ONE OF THE PRIORITIES OF GOVERNMENTAL POLICY

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Annotation. The article widely covers international peace and interreligious tolerance relations and opportunities provided to national cultural centers in the years of Independence.

Аннотация.Ушбу мақолада мустақиллик йилларида миллатлараро тотувлик ва динлараро бағрикенглик муносабатлари ҳамда миллий маданий марказларга яратиб берилаётган имкониятлар кенг даражада ёритиб берилган.

Аннотация. В данной статье широко освещены созданные возможности национальным культурным центрам, а также межнациональному согласию и отношениям межрелигиозной толерантности.

Key words: Inter-ethnic, democratic state, religion, government, national, shameful, Soviet era, socio-political, friendship, cultural center, implementation.

Калит сўзлар: Кўп миллатли, демократик давлат, дин, ҳукумат, миллий, ор-номус, Совет даври, ижтимоий-сиёсий, дўстлик, маданий марказ, ижросини таъминлаш.

Ключевые слова:Многонациональный, демократическое государство, религия, правительство, национальный, совестливость, Советский период, социально-политический,дружба, культурный центр, обеспечение исполнения.

Today, inter-ethnic peace and stability prevailing in the territory of Uzbekistan is the result of a rational national policy implemented in our country. The level of democracy in any country is determined by ensuring the equal rights,

irrespective of nationality, race, religion, social origin and status. Since Uzbekistan goes towards the creation of a democratic state, a free and fair civil society, this issue has been receiving special attention from the very first days of independence. Uzbekistan has always distinguished with the spirit of international respect and harmony in multi-ethnic and multi-religious conditions. If we look at history, according to the census in 1897 representatives of more than 70 nations and nationalities lived in Uzbekistan. According to the census in 1959, 113, and according to the census in 1989, 123 nations and nationalities lived in Uzbekistan. Obviously, in our land multi-nationality has been formed since ancienttimes, all the time in the country compared with other countries there have been developed values of mutual respect, peace, friendship and tolerance. The historical memory of our people and the state boasts the lack of anti-Semitism, racism, ignoring another nation, and shameful pages exhibiting other forms of disrespectful relations[1]. As you know, the difficult social relations appeared in political system of Uzbekistan in 90 years of the twentieth century have led the leadership of the country to the serious tests. Independent state policy, the tranquility of sociallife in the country, and responsibility for the establishment of inter-ethnic relations in the country were the most important tasks. In such a situation, our nation's own strong position and solidarity, and the well-thought-out and scientific based rational policies carried out under the guidance of our first president I. A. Karimov prevented severe forms of flammable situation. In particular, at that time the former Soviet government deliberately tried to create national conflicts among the people of different nationalities in Fergana, Buka and Parkent, and such conflicts were reasons for big sensations. In fact, these events «… did not happen with the will of Uzbek people. Internationalism, hospitality and goodheart, generosity have always been the unique qualities ofUzbek people. Our people have no hostility to the other nations»[2].

We know from the former Soviet-era history that not concerning about satisfaction of the social, spiritual and educational needs of the representatives of the various nationalities in multi-ethic conditions eventually leads to serious consequences. Because, at that time, a growing interest of each nation in the study of its own history, culture, language and traditions was assessed as the growth of nationalism. In fact, «any nation, no matter how small it is — is human wealth and destruction of national unity, its language, cultural and other features will lead to impoverishment of cultural and genetic capabilities on the earth». At the same time, the stability of internal political situation, national security and socio-economic development depend on the parity basis of interethnic relations. Historical and international experiences show that multi nationality will serve as a motivating factor in the development of the society in countries where provided harmony in interethnic relations. On the contrary, there are also examples showing that the wrong approaches to inter-ethnic relations, the lack of equality and harmony among them lead to social and political disaster and even to wars. This

[1]Karimov I. A. O'zbekiston XXI asr bo'saga'asida: xavfsizlikka tahdid, barqarorlik shartlari va taraqqiyot kafolatlari. 81-b.
[2]Karimov I. A. O'zbekiston mustaqillikka erishish ostonasida. - T.: O'zbekiston, 2011. b-51.

issue requiring vigilance and flexible approach is also very important for our Republic. Today, more than 130 nations and nationalities live in our country. More than 75 percentages of the population are Uzbeks; about 20 percentages are Russians, Tajiks, Kazakhs, Tatars, Karakalpaks, Koreans, Kyrgyz and Turkmens. In the content of the remaining 5%we can see more than 120 nationalities and ethnics [1].

Therefore, the leadership of our country made new way of conceptual analysis for theoretical and methodological problems in national issue and the issue of inter-ethnic relations in the conditions of independence, and has developed a new national policy.

The first steps in this direction have been started since 1989. In the same year, the public organizations-national and cultural centers were being built up. On January 13th, 1992, the Cabinet of Ministers of the Republic of Uzbekistan adopted the decision «On the Republican InternationalCultural Center». It defines that the center, through the coordination of activations of national and cultural centers will contribute to promotion of ideas of friendship, peace and harmony among the various ethnic groups; instill sense of common interest; develop the culture of inter-ethnic relations. These principles are the main directions of national policy, and national cultural centers is one of the main mechanisms for its implementation.

In addition, on October 21, 1989, there was accepted the low of the Republic of Uzbekistan «State language». It gave the status of State language for the Uzbek language, and identified the respect and guarantee of the prosperity of the languages of other nations. The basic principles of the national policy of Uzbekistan were reflected in the Declaration of Independence adopted in the second session of the Supreme Council on June 20, 1990, and in the laws «On the Protocol of Supreme Council on the independence of the Republic of Uzbekistan» and «On the State Independence of the Republic of Uzbekistan» adopted on August 31, 1991. In particular, the Declaration of Independence adopted on June 20, 1990 states: «The Supreme Council of Uzbekistan, on the basis of general discussion, announces about the decision to establish a democratic state, gives guarantee to the legal, political, economic, ethnic and cultural rights of all nationalities and ethnic groups living in Uzbek SSR as well as to the development of their native languages»[2].

And the «The Protocol of the Supreme Council on the State Independence of the Republic of Uzbekistan» states that the government of the country endeavor build ademocratic state that ensure decent life for every person, the honor and dignity of the human living in the territory of the republic regardless of their religious beliefs and social background. The law «On the independence of the Republic of Uzbekistan» is given much attention to this issue too. In particular, it notes that the state is partial to socio-political, economic, especially, cultural development of all nations and ethnic groups living in country. These provisions

[1]Xonnazarov Q. Mustaqillik va yoshlarni baynalmilal ruhda tarbiyalash. -Toshkent, 1998.b-82.
[2]O'zbekiston Respublikasining Davlat mustaqilligi to'g'risidagi hujjatlar. T.: O'zbekiston, 1991.b-6.

were further developed and strengthened in the Constitution of the Republic of Uzbekistan adopted on December 8, 1992. Thus, in the initial period of independence a solid legal foundation of national policy carrying out inter-ethnic relationswas created. And this presented real opportunities to solve national issue without any political interference and discrimination of representatives of other nationalities.

In development of national policy of Uzbekistan in the conditions of independence and its implementation, by taking into account the past history, spirituality and education, concentration on the world experience and approach to national issues taking place in the process of globalization with serious attention have got the decisive role. Therefore, at the presentday the issues of interrelationship within nationalities are getting strategic importance. In the period when the process of the establishment of democratic legal state and a fair civil society, to ensure regional peace and interethnic tranquility has a very important role. In such conditions, as the President of the Republic ofUzbekistan I.A. Karimov noted that is important to consider the following realities: **First,** the presence of certain non-antagonistic conflicts in the field of the inter-ethnic relations is the real event for the formation period of the new independent states. Further, the national interests and needs come near the interests of civil and democratic societies. **Second,** the existing conflicts should not be allowed to become inter-ethnic conflicts which lead to the tragic consequence sposing a threat to the security of the peoples and states. **Third,** the current socio-political situation, the inevitability and necessity of peaceful coexistence of nations, their common aspirations and wishes should be taken into account. And this should be expressed through the clearly targeted ethnic policy of the government and the formation of public opinions[1].

So, obviously, firstly, although the growth of the national interests is natural process, taking into account the nationalinterests of other nationalities and ethnic groups, creation of a culture of respect and ensuring common goals and interests among the representatives of different nationalities so that this process will not become a factor causing conflicts serve for the development of the society. Secondly, it is important not to be indifferent to any national problem taking place not only within the country, but also in the region and in the international arena in the conditions of globalization. At the same time, the rational national policy regarding the inter-ethnic relations is the main instrument of ensuring the peace and security in the country, and it aims the national problems which has occurred or may occur to be practically solved.

The main rules of the national policy of independent Uzbekistan have been announced in the following manner:

- The equal rights of all citizens of the republic regardless of nationality, race and religious beliefs;
- The priority of the human rights which determines the priority of the person and social justice in the society among all other rights;

[1]Karimov I. A. O’zbekiston buyuk kelajak sari. - T.: O’zbekiston, 1998.b-477.

- Paying attention to the rights of minorities, respecting their languages, traditions and customs, preserving their identity, as well as creating the necessary conditions for the all-round development;
- Focusing on highly developed and social-oriented market economy which provides social protection regardless of nationality of every person, every family;
- Finding out the social-political and peaceful solutions for the conflict situations in the inter-ethnic relations[1].

The exact mechanism has been developed in our countryfor implementation of each principle of this national policy. First of all, its solid legal basis — the Constitution of theRepublic of Uzbekistan was adopted. The Constitution is legal guarantee to ensure the equal rights, recognize the supremacyofa person, maintain ethnocultural diversity, carryout strong social protection and implement the socio-politicaland peaceful solutions for the conflict situations intheinter-ethnic relations.

Implementation of tolerance — based national policy, first of all, calls for the development of the education system whichis based on this principle. Because the education is the most effective instrument impregnating the ideas of tolerance and internationalism. In addition, to raise the youth which constitutes a significant part of the population of the country with the spirit of internationalism and tolerance is also an important condition to prevent the occurrence of national conflicts in the future. Conduction of educationin seven languages in our country, particular attention to provide educational institutions with textbooks and training manuals in different languages mean that our country's education system is also based on tolerance.The law «On Education» adopted in 1992, states that every person has an equal right to education regardless of there ligion, language, race, place of residence, nationality, originand work place [2].

Along with education anyone has anopportunity to show his/her talent regardless of nationality, language, race and religion too.

According to the existing national policy in Uzbekistan, there have been created wide opportunities for the development of the freedom of religious belief and spiritual world of every citizen regardless of nationality [3].A guarantee of freedom of conscience which includes rights of anyone tohave or not to have religious belief isenshrined in the Article31 of the current Constitution. At the same time legislation related to strengthening the freedom of religious belief and religious tolerance have been improved too. The law «On Freedom of Conscience and Religious Organizations» was adopted in 1991, and had been in practice until 1998 with some additions and modifications which were introduced in1993. During the last year's introduction of radical changes in this law was necessary in accordance with the requirements of this period, and on May 1998, the new edition of the Law was adopted by the Parliament (Oliy Majlis) of the Republic.

[1]Murtazaeva R. H. O'zbekistonda millatlararo munosabatlar va bag'rikenglik. -Toshkent, 2007.b-130.
[2]O'zbekiston Respublikasi Oliy Majlisning Axborotnomasi. T.: O'zbekiston, 1997, 9-son, 225-modda.
[3]Ата-Мирзаев О., Гентшке В., Муртазаева Р. Узбекистан многонационалный: историко-демографический аспект. Т.: Узбекистан, 1998.с-76.

In the legal documents adopted in our country, all necessarymeasures for ensuring the basic rights which be long tofreedom of conscience of citizens are being implemented. Today's lifestyle is a bright example. At present, 16 representatives of confessions live in our country, and more than 2000 religious organizations have been registered. Today, representatives of the titular nationalities together with representatives of other nationalities have been contributing to development of country by effective workin various sectors of society, and their work has been getting an appropriate assessment [1].

The presence of Compatriots-Russian, Tajiks, Ukrainians, Kazakhs, Koreans and Arabians among the heroes of Uzbekistan is a clear proof of this. In addition, on May 5, 1994, a medal of «Friendship» was established in our country underthe initiative of our President. Persons who contribute to strengthen friendship, mutual understanding and tranquility among the representatives of all nationalities and ethnic groups living in Uzbekistan, and persons who take an active part in strengthening the friendship and comprehensive cooperation between people of Uzbekistan and people of other countries are awarded with this high reward. Awarding persons who are not citizens of the Republic of Uzbekistan with a medal of «Friendship» is of particular importance.

In conclusion, we want to say that implementation of the above mentioned principles constituting a base of thenational policy has been resulteden formation of specific «Uzbekistan's model» of inter-ethnic relations. This processen sures internal political stability, peace and progressin the country, and is being recognized with a deep interest and recognition by the international community.

Such a recognition was done by the participants of the international conference: «Inter-religious equality, intercultural communication: the experience of Uzbekistan» held in the UN headquarters on September-October2007.

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UDC: 94.575(338.966)

THE HISTORY OF COMMUNICATION SYSTEM OF KHOREZM

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Annotation. The article is devoted to brightening up the origin of communication system of ancient people in the area of Lower Amu-Darya.

Аннотация. Мазкур мақолада Қуйи Амударё ҳудуди қадимги аҳолисининг алоқа йўллари вужудга келиши тарихи ёритилган.

Аннотация. В этой статье освещена история возникновения путей древних населения Нижней Амударьи.

Key words: Lower Amu-Darya, The Turan plane, Yanbashkal'a, Akchadarya Mesolite, Neolithic.

Калит сўзлар: Қуйи Амударё, Турон пасттекислиги, Ёнбошқалъа, Оқчадарё, Мезолит, Неолит.

Ключевые слова: Нижний Амударья, Туранская низменность, Янбашкалья, Акчадарья, Мезолит, Неолит.

The lower Amu-Darya basin represents the northern-west and northern-east area of Turan lower plain. It is considered to have a peculiar climate and geographic position which differs from neighboring regions. The results of exploration who investigated Khorezm and its geologically connected regions such as Sariqamish, Uzboi, the lower and middle parts of the Sir-Darya, show that in the fourth period of the Earth geology those above mentioned regions came into existence. Historical facts containing the issues made by Khorezm expedition archeologist and Karakalpakstan explores throughout lower Amudarya, Sariqamish and Uzboi areas,[1] help us to illuminate the development of the history of communication of our ancestors.

According to the historical facts from exploration issues, the communication system was founded by the primitive people who hunted near Sulton Uvais Mountains.

It is expedient to learn the roots of the history of communication history of our ancestors by dividing into historical periods. The first period is the last stoneage – the end of thousand years.

[1] Кесь А.С. Антропогенное воздействие на формирование аллювиально-дельтовие равнин Амударьи/Культура и искусство древнего Хорезма. М. «Наука» 1981, с.73. Ўша муаллиф. Причины изменения уровня Арала в Голоцене//Известия Ан СССР, Серия географических. М. 1978. № 1.с. 8-16.

Historical facts tell us that new generation of the hunters who used to live in the south-east of Ustyurt plateau about 40-12 thousand years B.C. came to the area near Sulton Uvais Mountains in search of new natural economic place.

In this way the right coast was connected with the area of Sulton Uvais Mountains.[1]

The road between Ustyurt plateau and Tuyamayin area has been formed by the tribes who lived in the mezolit period who came this place in order to find natural-economic source to live having abandoned their own place of living due to the lack of food in IV century B.C.[2]

The second period of the IV-III centuries B.C.

In this period the following generation of people who earned their living by hunting moved to the hill Yonboshqala because of rise of the water level of the Amudarya and constructed wooten columned, semi earth huts containing the traditions of their ancestors. In this way the road connecting Sulton Uvais Mountain with Yonboshqala hill was developed.[3]

The tribes, who were settled in Yonboshqala hill, had to migrate due to rise and fall of water level in the Aqchadarya which caused the formation of short roads.

According to research works by A.V.Vinogradov in the first quarter of the second half of III B.C the new generation of Kaltaminarians had to migrate to Sariqamish, Uzboi and Southern – West Kazakstan, Urals, because of the deficiency of food[456]. This migration also resulted in developing connective ways between the southern, northern-east areas of the Aral Sea, Sariqamish, Uzboi and the northern Aqchadarya tribes.

The third historical period consists of the continuing the communicative ways existing from the II BC to the III BC.

The historical facts show that the connecting road between Khorezm and Kazakhstan was developed by the tribes called “Andronovo” who moved from northern-east of Kazakhstan to Southern Aqchadarya.[7] It is necessary to emphasize that the migration of the tribes from Volga, Southern-West of Sibir through Kazakhstan deserts to Aqchadarya basin resulted in the density of population in this area.

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[1] Виноградова Е.А. Первые палеолитические находки в Султануиздага //Приаралья в древности и средневековье. М. ИВА Ран Наука, 1978. С 74-77.

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In the II B.C because of decrease of the water level in the Amudarya, the tribes had to move to the Aqchadarya basin and developed the connection.[1] The explorer Q.Sobirov supported the opinion of B.I. Vainberg`s idea about the migration of tribes in the Bronze Age to Southern Aqchadarya.[2] In this case in the end of Neolite period, the road formed by Kaltaminarians served Sariqamish and Uzboi tribes in moving to the Aqchadarya basin again.

Conclusion.

From above mentioned ideas and facts we may conclude that the people who used to be hunters near the mountains of Sultan Uvais had to search for new place because of the lack of food.

In this way the first land ways were came into existence by Khorezmian hunters.

In the end of 4th century B.C. Southern Aqchadarya, Tuyamuyin Kaparas oazis and Sariqamish Uzboi areas were connected by land way. It is probably that the land road between right and left coasts of the Amu-Darya was conducted through Tuyamuyin.

In the II century B.C the road between the Northern Aqchadarya and Sariqamish, Uzboi regions had to stop to be used for a while, because of the decrease the water level in the Aqchadarya and Syrdarya. The tribes living in this area had to return to their native land via the way founded by their ancestors.

We should point out that the experience in forming connective ways of our ancestors in the Neolite, Eneolite and Bronze ages served as the main source for the next tribes living in the following ages.

In the last stone and mezolite ages the people needed natural-economic places to live because of deficiency of food and raw materials and by exchanging. These they developed the roads.

The roads constantly changed due to our ancestors' needs for natural-economic recourses as the water level in the Amudarya regularly rose and fell. Eneolite, Bronze and archaic and antique ages need to be analyzed individually as in this period our ancestors organized the relations with the world.

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UDC: 821512

THE "BAHUVRIHI" S ARE FORMED ON THE BASIS HUMAN'S FIGURE

Jumaniyozov A. J.Rahimova Sh. (UrSU)

Annotation. In this article the attributive compound words or "bahuvrihi" s which express human's face are analyzed by the means of examples.

Annotatsiya. Ushbu maqolada o'zbek tilidagi inson qiyofasini tasvirlovchi attributiv qo'shma so'zlar ya'ni bahuvrihilar ma'no jihatidan tahlil qilinadi.

Аннотация. В этой статье описывается внешний вид человека с помощью атрибутивных словосочетаний, которые могут быть проанализированы с точки зрения значения бахоурихий.

Keywords: bahuvrihi, attributive compound words, component, attribute.

Kalitso'zlar: bahuvrihi, attributiveqo'shmaso'zlar, komponent, aniqlovchiliqo'shmaso'zlar.

Ключевые слова: бахоурихий, аттрибутативные словосочетаниия, компонент, определение.

Taking into consideration that the term "bahuvrihi" which is being used in the title of our theme is still not well-known to Uzbek linguists closely, firstly, we will define above mentioned term and lexicological means understood by that word. The word "bahuvrihi" is considered to be the product of Sanskrit by its origin. This term means "a lot of rice" or "rich in rice" in ancient Indian language. Bahuvrihi is one of the types of attributive compound words. One can comprehend that the compound words (composite) express human figure beneath. It is the fact that attributive compound words contain two components (dependent, independent) and they specify each other (the former specifies the latter, the latter specifies the former). The components may change their place in the word, for example, "nozikbel-belinozik". The difference among bahuvrihis and other compound words is that the meaning of human (person) which is realized by it owns its metaphorical-metonymical peculiarity, in other words, by these compound words one can understand a living person (human). According to the changes in meaning semantics of the word is not expressed. For example, bahuvrihi "xumkalla" stands for "a stupid person" while its dictionary meaning is lost here as "xum" (a jug) and "kalla" (a head).

Furthermore, bahuvrihis are widely used while expressing a person's character *(toshbag'ir, ochko'z, shirinsuxan),* appearance *(olako'z, kaltasoch)*, feelings *(alamzada, jabrdiyda*), clothes *(kaltayubka, uzunko'ylak)*, body parts *(jigargo'sha, yolg'izqo'l)* and generally describing human's characteristics. During our research it has been observed that our national language is very rich in

bahuvrihis. We will be the witnesses that they are being used in all social levels (dialect, literary and spoken language) of our national language, in all spheres of our daily life (family, workplace, among contemporaries as entertainment) and mainly human's eating, drinking, clothing, appearance and his life image and the owners of language played a great role as inventors in these matters.

As being shown in this article's title, we will statemore than 100 language units which were formed on the basis of giving name to human's figure or appearance, their body shape, their image and facial expressions. If theyare, firstly, used to specify the appearances such as dignity, grandeur, greatness (sersavlat, ulug'sifat, barzangisifat, purviqor, badhaybat, pahlavonsifat, devsifat,devqomat) or weakness in human's figure (jonsarak, pajmurda):

"Usokin, kamtarin, muomaladan ozik, lekin ulug'sifat". (Oybek.Navoiy)

then, we can come across to the bahuvihis expressing this imagination much more evident with comparing components such as (devqomat, sarvqad, sarvqomat).

a) *" Shu payt divanda o'tirgan bir devqomatgako'zim tushdi"(Sharq yulduzi).*
b) *" Yuzi gul, sarvqomat, sochi sunbul,*

Ko'zi nargiz kabi mastona bir kel" (Habibiy.

c) *" U ovqatni ham yurib yeydigan jonsaraklardan(Gazetadan).*

Among these bahuvrihis there are the ones which evaluate human's beauty and his positive image *(xushqomat, xushbichim, xushtabassum, xushro'y, xushsurat, xushsuhan, sarvinoz, serpardoz, jununvash, sohibjamol, pariparkar, gulandom, shirindimog')* for instance:

a) *"Yupqa oq kigizdan qalpoq kiygan xushqomat qizniavval tanimabman." (P.Qodirov. Qadrim).*

In line with above-mentioned examples you may see the ones owning negative meaning (*badhaybat, badbashara, badro'y, badchehra, badqovoq, badsurat ,jinninamo, badburush*).

b) *" Soqchi mo'ylovdor, devdek, ulkan gavdali, badbasharabir yigit ekan". (X. To'xtaboyev. Yillar va yo'llar).*

It is evident that while defining positive meanings of bahuvrihis a persian word **(xush–yaxshi,ser-ko'p)** and negative ones **(kam-oz, bad–yomon)** words' widely usage can be stated without hesitation. The component of a word can increase degree, quantity, number and capacity*(sersavlat, sersoqol, serkiprik, serpardoz)* e.g.:

a) *"Laganlar bo'shayotganda eshikdan bir qora sersavlatodam kirib keldi".(Parda Tursun. O'qituvchi).* or decrease *(kamqon, kamsoqol, kamgo'sht, kamsuhan)* e.g.:
b) *" Kasallar orasida kamqonlar ko'p". (Vrach bilan suhbat).*

In the line of attributive compound words describing human's positive figure on the impact of his inner feeling (*xushxandon, xotirjam, sarxush, sarmast)*

c) *"Ko'chada sarxush odamlardek borar edim–dedi Kamoladdin". (T.Jalolov. Oltin qafas).*

And the bahuvrihis expressing human's negative appearance, grief and stress in the heart, bad mood *(g'amzada, alamzada, hastahol, hayolparishon, parishonhol, hayolparast, xafahol, dardmand, kasalmand)*

d) *"Zindonxonaning devoridagi tuynukdan oy mo'ralab, bu ikkala g'amzadani hayrat bilan tomosha qildi." (M. Osim. Ajdodlarimiz qissasi).*

are outnumbered in oral and written speech.

There are some bahuvrihis that they denote some stratums of our social life, sections or their social life and lifestyle. We can bring those as examples for our thought *bangibashara, banginusxa, dehqonsifat, darveshsifat, devonasifat, faylasufnamo, falokatzada, telbanamo, jinninamo, avliyonamo* e.g.:

a) *" Uning hayolparast , merov, devonasifat odam ekanligiaftidan va qilig'idan bilinib turar edi". (M. Osim.Elchilar).*
b) *" Toshtemir ham keyini toifa oyoqyalanglardan bo'lib, Mirzacho'lga boruvchilar to'piga qo'shildi." (H. G'ulom. Feruza).*
c) *" – Hm. Ana shunaqa oyoqyalanglardan qo'rq-da – boshini liqqilatdi Xo'jayor.(A.Narziqulov. Hayot yolqini.)*

The most emphasizing thing while forming bahuvrihis indicating human's figure in general is that all attributive compound words formed human's figure from head to toe. We will try to support our opinion with real life examples and begin from the examples denoting the highest part of human body, "head".

"Head"

Such kind of bahuvrihis can be supported by these examples below:*yaltirbosh, qoqvosh, xumbosh, qovoqkalla, kadikalla (xorazm shevasidan), xumkalla, kallaxum,tepakal.* Among the examples it is worth mentioning the ones which converse their places *(xumkalla–kallaxum)*simultaneously the examples with phonetic changes as "qoqvosh".When the occasion arises it is worth stating that the words "xumkalla- kallaxum" are defined in our dictionary in the first meaning as " a person with a head looks like a jug" whereas in the second meaning it denotes " a stupid person, a fool", but the other meaning that is used when a person is extremely exhausted and in a stress is not given in it. It is not necessary to mention the bahuvrihi "tepakal" stands for a person who has no hair on the head.

a) *" Majlis zaliga kirsam bir yaltirbosh doklat qilayotgan ekan."*
b) *"Tergovchi yosh bo'lsa ham, sochlari to'kilgan, tepakal akan."*
c) *"Xumkalla! Shariat yo'lidan toygan qizning so'ziga ishonasanmi." (Oybek, Tanlangan asarlar).*

As human's part of the body " head" is certainly connected with hair *(oqsoch, qorasoch, jingalaksoch)* , we will give examples for themalso, but in its turn it should be mentioned that some bahuvrihis here are in their dictionary meanings *(oqsoch – oq sochli odam- a person with white hair),* slowly in metaphorical meaning in language *(oqsoch – boylar, zodagonlar oilasida yollanib xizmat qiluvchi ayol, cho'ri- a servant- a person who serves in the family of royals and the rich, a maid).* It is interesting that the definition given to that word in the dictionary begins with metaphorical meaning.

a) *Bu ayol oilamizda shunday hurmat qilinardiki, uni hech kim oqsoch deb o'ylamasdi." (Og'zaki nutqdan).*

"Forehead"

b) *" Eshik oldidagi kravatda 65 yoshlardagi do'ngpeshona o'tirardi."(X. Sultonov, Bir oqshom ertagi).*

It can be seen from the example that the bahuvrihi " do'ngpeshona" (a person with a wide forehead) indicates a man, an old man. Among our examples there is one attributive compound word that denotes women, "guljabin" (gul+peshona) gul yuzli (a woman with a beautiful face, forehead), it is not difficult to feel that it refers to women.

a) *" Guljabinlar davrasida mayliga ming roziman, bir umr bo'lsam asir bo'lsam kamol Dushanbada." (Uyg'un, Tong qo'shig'i).*

"Eyebrow"

Among the examples relating to this word *(baroqqosh, qalamqosh, qo'shmaqosh, serqosh, kamonqosh)* one can come across to the persian bahuvrihi"abro'kamon" (abr- qosh it means "eyebrow" in persian).

a) *"U baroqqosh ko'zi chaqchaygan, afti ishshaygan".*

b) *"Qulbachcha va cho'rilar orasida abrokamon, mo'rchamiyon, pistadahan, sarviravonravonlari juda ko'p." (Sadriddin Ayniy, Qullar).*

"Eyelid"

We found two examples with this word (*badqovoq, bodomqovoq)*:

a) ***"*** *... Yosh bir juvon… , bellari xipcha… bodomqovoq… va o'n sakkiz yoki o'n to'qqiz yoshlardaki go'zal bir malak." (Mirmuhsin, Me'mor).*

"Eyelash"

b) *"Tog'li badahshonlilar orasida qo'shqoshlar va serkipriklar juda ko'p."(Hikoyadan).*

"Eye"

We can combine these examples to the ones formed with the word "eye": *bo'tako'z, bo'taloqko'z, zag'chako'z, xumorko'z, olako'z, to'rtko'z, baliqko'z.* It is interesting that by the example "olako'z" one can understand eye's shape and the measurements between the colors white and black, in other words, a person with eyes that owns more white than black. As for the example"zag'chako'z", it refers to the person with blue eyes. When the occasion arises it is worth stating that in folklore there are some of the bahuvrihis relating to eyes: *olako'z, qorako'z, ko'kko'z, qizilko'z, qisako'z, sariqko'z, kiyikko'z, jayronko'z, ohuko'z, burgutko'z*.They are widely used in public verses.

a) *"Ey, olako'z gal bari". (Xalq og'zaki ijodi).*

"Nose"

The examples belonging to this body part are the following: *qirraburun, qushburun, tanqaburun.*

a) *"Doro 1 baland bo'yli qushburun, chiroyli odam edi." (M. Osim, Ajdodlarimiz qissasi).*

"Mouth"

One of the most important body parts of human is mouth. Here are the examples from oral speech denoting to it: *og'ziochiq, og'zikatta, og'zivayron, zaharog'iz*. But in the dictionary we found an example as **" kampirdahan"**:

a) *"Eshikdan tishlari tushib, lablari ichiga kirib ketgan, kampirdahan, zag'chako'z bir chol kirib ta'zim qildi. (M. Osim, O'tror)*.

Among the examples there are the examples belonging to not only mouth but also to its inside part, teeth.

b) *" Yirik gavdali, qisiq ko'z, tanqaburun bu odam, aftidan, tillotishning sherigi edi." (A. Ibodinov, " Latofat" do'konidagi qatl")*.

"Ear"

With this component there are following examples*(yalpangquloq,shalpangquloq)* and in oral speech there are the ones below*(eshakquloq, garangquloq, karquloq, paytavaquloq, oqquloq* rus millatini mahalliy xalq o'rtasida nomlanishi).:

a) *"U armiyadan bir oqquloqqa uylanib kelibdi." (So'zlashuv tilidan)*.
b) *"O'rgildim senga o'xshagan paytavaquloq o'zbekdan." (O'. Hoshimov, Ikki eshik orasi).*

It is apparent that above-mentioned examples refering to the head of a human are outnumbered and varied. We have found the examples on his other body parts hands persian examples *(zabardast va chapdast)*, from our national language *(yolg'izqo'l, yakkaqo'l, arzonqo'l*)and the ones changed their places **"qo'lqanot" (ayrilmas do'st, birodar ma'nosida)**, breast (*yalangto'sh)*, backside *(kaltabaqay, kaltadum)*, with feet*(yalangoyoq, chalishoyoq, og'iroyoq)*. All of the above-mentioned examples are metaphorical meaning. Thus, "og'iroyoq" means pregnant women, "yalangoyoq" stands for poor people and as for "yolg'izqo'l" it means a person who is alone in the family and has no assistant next to him.

The most thrilling thing is that while evaluating human's appearance one can find the examples which enlarges not only his external side but also his tendones are taken into account *(sertomir, oqsuyak, kamgo'sht, xomsemiz, kamqon)*

a) *"Bu bo'limda asosan kamqonlar yotadi." (Hamshiralar tilidan).*
b) *"Xo'jalar ilgaridan biz arab avlodimiz, oqsuyakmiz deb o'zlarini baland tutib keladi." (Pardatursun, O'qituvchi).*

In addition to our researches on this theme it is worth stating one thing that among collected examples our people widely used stylistic opportunities while forming words. We can support our view with the examples formed with the word "face". Here we can see the lexeme from countenance tillface.

a) *"Alqissa baq- baqaloq mulla Mamasolih bin Mulla Matkarim maxdum bilan bangibashara bir soat chamasi mudrashdi." (N. Maqsudiy, Laylat-ur qadr)*
b) *"Eshik ochilib bir gulyuz kirib keldi." (Hikoyadan.)*
c) *"Gulgunmisiz, gulruxim, dil bog'imda nargizam, quyosh yanglig' chorlaysiz muhabbati durkunim. (E. Ohunova).*
d) *"Mubtaloman parirog'a, ul ko'zlari ohuga." (Ya. Mamatxonov).*
e) *"Qiz ruxida tashvish soyasi,*

O'ylanadi ul parichehra,

Balki she'rdir bu qiz doyasi?" (M. Qo'shmonov, Ali Qambar).

f) " Jamshid ostonada pariruxsorni ko'rib, andak dovdiradi."(T.Malik, Shaytanat).

As a conclusion to the inverstigation on human's appearance, his parts of body and mood belonging to them are partly seen as attribute. It should be mentioned that they denote certain people's behaviour, appearance and they are used as independent language units. It testifies to the fact that our nation's thought are improving, opinions are deepening, in its turn, our national language is getting rich in new lexical units and its expressivness and power.

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UDC: 811. 111'373

LINGUO-CULTUROLOGY AND CROSS CULTURAL COMMUNICATION AS NEW LINGUISTIC TRENDS IN FOREIGN LANGUAGE TEACHING

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Annotation: The article deals the role of Cognitive linguistics, Linguo-culturology and Cross-cultural communication in optimization of foreign language teaching, the author suggests new definitions of the notions "concept" and "linguacultureme".

Аннотация: Ушбу мақолада когнитив тилшунослик, лингво-культурология ва маданиятлараро мулоқот масалари кўрилган бўлиб, автор "concept" and "linguacultureme" тушунчаларига янгича талқин беришга харакат қилган.

Аннотация: В этой статье определены роли когнитивной лингвистики, лингво-культурологии в кросс-культурной коммуникации, и автор предлагает новую определению к понятиям “concept” и “linguacultureme”.

Key words: Cognitive linguistics, Linguo-culturology and Cross-cultural communication.

Ключевые слова: когнитивная лингвистика, лингво-культурология и кросс-культурная коммуникация.

Калитсўзлар: когнитив тилшунослик, лингво-культурология ва маданиятлараро мулоқот.

It is commonly known that in recent years linguistics has become rich in new trends as Cognitive linguistics, Linguo-culturology and Cross Cultural Communication.

Cognitive linguistics deals with the category of knowledge, the problem of kinds of knowledge, the ways of its lingual presentation, the role of the language in acquiring knowledge by man, formation of lingual and conceptual pictures of the world.

Linguo-culturology studies the relation between language and culture, the presentation of culture in language.

As to Cross Cultural Communication, it is exchanging texts (discourse) in the process of communication in which one needs to know both the language and the culture of the owners whose language is being learnt. Ignorance of the culture of the owners of that language may cause a failure in communication, even if the text is grammatically, lexically and phonetically correct.

Before speaking about the role of these new linguistic trends we should like to dwell on some terms used in Cognitive linguistics, Linguo-culturology and the traditional linguistics which are of great importance in defining the role of those trends in foreign language teaching. These terms are as follows: “meaning”, “notion”, “concept” and “linguocultureme”.

“Notion” is one of the units of mentality. It is the essential features of a thing or an event reflected by some word, morpheme or word combination which enables us to differ it from other things or events.

“Denotational meaning”is a lingual or speech equivalent of “notion”. AsA.B. Bondarko writes (Бондарко 1978, 82-83), notion may get enriched owing to its use in language or speech. E.g. the Uzbek words “чиройли” and “гўзал” express one and the same notion “beautiful”, but in the second synonymous word the notion “beautiful” is enriched with a stylistic (connotative) feature. This phenomenon can be observed in any synonymic set.

The main term of Cognitive linguistics is “concept” which has become one of the most popular themes for linguistic research works in Russia and in many post-soviet countries.

The idea that concept is a unit of mentality is universally acknowledged. But there are a lot of different definitions of it, which we shall not consider in our article.

In our opinion, concept is the total knowledge (most features reflected) of a thing or an event, its image and attitude (positive, negative or nutral) to it. As concept reflects most of the features of things and events, it is much more larger than notion, which reflects only limited essential features of things and events. It should be noted that when a notion is newly born, there is no difference between it and a concept. In this situation we can use both terms (notion and concept) interchangeably. But with the revealing of new features of the thing or the event, or with the appearance of images or attitudes to the thing or event, there comes into being a concept on the basis of the mentioned notion. The concept includes that very notion. Figuratively speaking, a concept is an iceberg, the top which is on the surface of the water is a notion.

According to prof. Vladimir Bolotov (Болотов В.И. 2008, 96), concept is verbalized by text. In our opinion, the fragments of a concept is verbalizedbymorphemes, words, phraseological units, proverbs, word combinations, sentences, complicated syntactic units etc.

Concept is a multi-dimensional structure. According to B. A. Maslova [МасловаВ.А. 2004,59], concept includes notion, connotative features, image, attitude, associational characteristics.

The number of notions, conceptsof nations and their structure is different. Certain nations do not possess some of them. For example, the notions such as "electricity", "computer", "tellevision" does not exist in the semantic (conceptual) structure of primitive languages (For more information see: ЮсуповУ.К.). These lacunas are explained by different degrees of economic, political, technical development of nations, their culture, customs, mentality, geographical location, religion etc.Besides, languages dissect and categorize some parts the word differently. As a striking example of difference in concepts of different nations can serve the concept "бутерброд" (sandwich) in Russian and German. As Z.D. Popova and I.A.Sternin say that in Russian this concept contains such cognitive features, as "with butter", "with sausage", "with cheese", "with a cutlet", whereas in German it contains the only cognitive feature "with butter", because Germans make "бутерброд" with butter.

The idea that concept consists of centreand periphery is universally acknowledged, but there are serious differences in the opinions about the structure of concept. For example, Yu. S. Stepanov (Степанов Ю.С. 1997, 30) and S.G. Vorkachev [Воркачев С.Г. 2004, 7] recommend to include ethimological information in the structure of concept along with other features. If we proceed from this idea, most concepts will become individual and they will be possessed only by those who know ethimology of words and average people don`t possess them. Cognitive linguistics is mainly interested in people`s (nation`s) concepts, not in individual ones. That`s why we cannot share this idea.

As far as the term linguocultureme is concerned, it was introduced in linguistics by the Russian scientist B.B. Vorobyev (1997). At present most linguists understand by this term "cultural concept". We suggest the following definition of this term: "Linguocultureme is a lingual or a speech unit which

reflects a piece of the culture of a nation". Linguoculturemes may be morphemes, words, phraseological units, proverbs, word combinations, sentences, complicated syntactic units and texts. A linguocultureme, incontrast to a concept, is a lingual or speech unit, it has its own form and meaning. To our mind, the suggested definition of linguocultureme makes it possible to use it in cross-cultural communication. Nevertheless, we must distinguish a linguocultureme from a cultural behaviour which is not a linguistic unit.

So far we have been stating our attitude to the main terms used in cognitive linguistics, linguaculturology, cross-cultural communication and in traditional linguistics. Now we shall consider the role of these new linguistic trends in foreign language teaching.

It is well known that the main aim of foreign language teaching is to teach students to communicate in the given foreign language.

As investigations show, in communication we use notions and the linguistic units with their meanings, but not concepts. For example, in the sentence "I see a woman" the word "woman" expresses denotational meaning (notion) "a fully grown human female" consisting of four semes which reflect the four generalized features of the denotation. In this case it does reflect the social status of the woman and her other cognitive features which are necessary components of the concept "woman". Here rises a question: Do we need the notion "concept" in foreign language teaching at all? But we have never used it before as it has appeared quite recently and it is still not reflected in dictionaries. Nevertheless, we did well without it. The terms "meaning" and "notion" suited and still suit us very well.

We think that the notion "concept**"** is useful in foreign language teaching when we select texts and topics for the students to study. For example, the texts: «Holidays», «Wedding», «Navruz», «Picnic», «Customs», «National food» etc. It is also useful when somebody asks such questions as What is picnic? or asks you to tell about something.

Concept-maximum is verbalized by text, other units verbalize only its fragments.

Linguo-culturology and Cross Cultural Communication are of great significance in optimizing foreign language teaching. These new linguistic trends brought foreign language teachers to understand that they must teach students not only the given foreign language but also the culture of the people whose language is being learnt. Such attitude to foreign language teaching makes it necessary to establish linguoculturemes and cultural behaviors of the nation whose language is being learnt, it also necessitates compiling explanatory and translation dictionaries of linguoculturemes, selection of special concept-based texts verbalizing the main and vital concepts of the nation. So, of the new linguistic trends particularly Linguo-culturology and Cross Cultural Communication play a great role in optimizing foreign language teaching.

Thus, it is high time to regard linguo-cultural approach as one of the main principles of methods of foreign language teaching.

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UDC: 811.111

COMPARATIVENESS AS A SEPARATE CATEGORY (IN THE EXAMPLES OF ENGLISH AND UZBEK LANGUAGES)

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Annotation: The article is about the expression of comparativeness in English and Uzbek. The main attention is paid to the syntactic role of the components expressing comparativeness in a sentence.

Аннотация: Мақолада компаративлик категориясининг инглиз ва ўзбек тилларида ифодаланиши тўғрисида сўз боради. Асосий эътибор компаративликни ифодаловчи компонентнинг гапдаги синтактик ўрнига қаратилади.

Аннотация: В статье речь идет о выражении компаративности на английском и узбекском языках. Главное внимание обращено на синтаксическую роль компонентов, выражающих компаративность в предложении.

Key words: comparativeness, syntactic category, a sentence, component, subject, predicate, attribute, object, adverbial modifier.

Калит сўзлар:компаративлик, синтактик категория, гап, компонент, эга, кесим, аниқловчи, тўлдирувчи, ҳол.

Ключевые слова: компаративность, синтаксическая категория, предложение, компонент, подлежащее, сказуемое, определение, дополнение, обстоятельство.

Comparativeness has a universal character in all languages as in English and Uzbek. Comparativeness has been shortly learned as a category by the semantical point of view in the lexical, morphological and stylistical levels according to its ways of expressiveness. But, though there are several scientific articles, works about the category of comparativeness, it hasn’t been learned yet as a separate scientific object in the syntactical level of English and Uzbek languages. By this

we mean that the place of objects expressing comparativeness in a sentence i.e. expressiveness of comparativeness towards parts of speech hasn't been learned thoroughly yet. To reach this aim we preferred to use the method – separating to components in analyzingthe sentences in which comparativeness is expressed. And it is worth to put forward the task that the category of comparativeness has not been illustrated yet with the help of linguistic methods.

There are various ideas about componential analysis of a sentence composition. For example E.D. Guliga, E.I. Shendels pointed out like this, "... analyzing sentences separating to components has just begun and we don't have a full knowledge about the phenomena about the semantic structure and denotational – conditional sides of a sentence. We have only narrated just our idea which is characterized commonly".[1] Sh. Rakhmatillaev also agreed with this idea.[2]

There are following basic tasks in componential analysis of a sentence composition in which comparativeness is expressed:

1) To define syntactic relations of syntactic units in a sentence in which comparativeness is expressed;

2) To define differential syntactic marks of the components in the sentence in which comparativeness is expressed;

3) To illustrate methods of expressing comparativeness with the help of componential models;

4) To define the place of the units expressing comparativeness in the in a sentence in syntactic layer in the examples of different structured languages;

5) To learn the similarities and differences in the expression of the category of comparativeness in different structured languages.

Componential analysis of sentences with comparative elements is differed from traditional syntactic analysis by the above mentioned principals.In the traditional grammar by the syntactic analysis of a sentence we mean to define the parts of sentence in the way of questions to them and in the way of separating into primary and secondary parts of a sentence. The terms used in it "a subject" and "a predicate" are used as independent terms. O.V. Dolgova puts forward the following idea about this: "... subject and predicate being considered as primary parts of a sentence haven't got linguistic definitions: they are not basically identified as a grammatical phenomena, but semantically they are often confused with the phenomena of subject and predicate, they are characterized from the formal point of view not being fully proved".[3]

In the following work the process of syntactic analysis of a sentence differs from analysis dividing into parts of a sentence. The terms of parts of a sentence will be changed into other terms i.e. we express them with differential syntactic marks differing one nuclear component from another. Thus, we use such linguistic

[1] Гулыга Е.В., Шендельс Е.И. О компонентном анализе значимых единиц языка // Принципы и методы семантических исследований. – Москва, 1976. – С. 309-310.

[2]Рахматуллаев Ш. Лексема ва фразема маъносини компонент таҳлилининг баъзи натижалари // Ўзбек тили ва адабиёти. – Тошкент, 1986. - №3. – Б. 17-19.

[3] Долгова О.В. Синтаксис как наука о построении речи. – Москва: Высшая школа, 1980. –С.46.

terms[1] as nuclear predicative 1 instead of a subject, nuclear predicative 2 instead of a predicate, dependent components instead of secondary parts of a sentence. Such differential syntactic markers are separated in the way of putting elements opposite to each other in the syntagmatic direction.

Componential analysis of a sentence structure plays an important role in differentiating syntactic relations of differential syntactic markers from each other. Using the method of experiment – dropping and adding components, nominalizing, explication transformations play the main role in identifying syntactic relations.

Identifying syntactic relations being based on the methods of transformation and explication in componential analysis of a sentence structure gives a broad opportunity to identify differential syntactic markers of sentence components. In the ideas of some linguists, in traditional grammar, syntactic relations are considered in the layer of word combinations and they are divided into predicative and non-predicative relations.[2]Predicative and non-predicative word combinations are different from one another according to their grammatical functions. Therefore, predicative word combination expresses two grammatical functions in a sentence – predicativity and modality. And in non-predicative word combinations the terms as agreement, government and healing are were used. The definite solution hasn't been found out yet about this theory either.[3]

Comparative combinations can come in different syntactic places in a sentence i.e. they can come in the place of nuclear components (a subject and a predicate) and non-nuclear dependent components(an object, an attribute and an adverbial modifier). Thus, we can come to conclusion that both subject and predicate can be compared and therefore, object, attribute and adverbial modifier can also be compared. The method of modelizing syntactic relations in a sentence structure is carried out by composing junction models. Junction model was taken from Latin "junction" and means connection, relation.[4]

It is composed in horizontal directionand expresses real distribution and relation of the components in a sentence with each other.

On the basis of these syntactic relations, differential syntactic markers of sentence components and their morphological features are commented on the basis of component models.

Conclusion

In the examples of English and Uzbek languages it is possible to divide the syntactic units expressing comparativeness into five groups according to their places in a sentence:

1) expression of comparativeness towards the subject;

2) expression of comparativeness towards the predicate;

[1]Усмонов Ў.У. Тўлиқсиз гапларнинг типологик таҳлили // Тўплам. – Самарқанд, 1996. – Б.90.

[2] Смирницкий А.Н. Синтаксис английского языка. – Москва: Лит. на иностр. яз., 1957. – С. 47-48.

[3] Нурмонов А. Тилни системали ўрганиш ва синтаксиснинг айрим мунозарали масалалари // Ўзбек тили ва адабиёти. – Тошкент, 1988. - №5. – Б. 22-23.

[4] Мухин А.М. Модели внутренних синтаксических связей предложений // Вопросы языкознания. – Москва, 1970. - №4. – С. 68-69.

3) expression of comparativeness towards the object;;
4) expression of comparativeness towards the attribute;;
5) expression of comparativeness towards the adverbial modifier.

So, we can say that the results of separately analysis of the above mentioned types of the expression of comparativeness gives the opportunity to consider the comparativeness as a separate syntactic category.

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UDC: 811.111

IMPROVING COMMUNICATIVE LANGUAGE SKILLS THROUGH ROLE PLAYING ACTIVITY

Atajonova M.I. (UrSU)

Abstract. This article is devoted to the importance of role playing in teaching the English language to upper intermediate level learners.

Annotatsiya. Ushbu maqolada Ingliz tilida muloqot qilish malakalarini rolli o’yinlar orqali rivojlantirish haqida ma’lumotlar keltirilgan.

Аннотация. В данной статье представленаинформация о развитии разговорной речи на английском языке с помощи ролевых игр.

Key words: role play, learning environment, drama activity, collobarative learning, interact.

Калит сўзлар:ролли ўйин, ўрганиш муҳити, мулоқот қилиш малакаси, ўқув жараёни.

Ключевые слова:ролевые игры, среда обучения, навыки общения, учебный процесс.

Role play is one of the most topical subjects in modern methods of teaching English. English as a foreign language is taught at high schools, colleges, universities etc. Like any other subjects, English can be taught by a formative or the communicative approach. Throughout the completion of the article lots of materials, literature and other resources were revised by us. By investigating we aimed to know whether the scores of speaking taught by using role play better or not by comparing the students' scores before and after being taught by using role play technique, to develop learners' speaking skills through communicative language activities and games. Therefore, we have selected modern approaches and methods (through activities and games) of teaching English to students.

At present most of the trained teachers of our country are teaching English using different activities and games in their classes. So, we wanted to know the learners' and teachers' perception of these methods and approaches, how they implement communicative speaking activities and games, rather than Traditional Approach. To compensate for the limitations of the traditional language teaching methods, new ways of teaching have been introduced in EFL and ESP settings to improve learners' abilities to use English in real contexts.

The important advantage revealed by us is the study of language through varieties, which focus on different types of role playing activities and games, from which both teachers and language learners can benefit.

New teaching approaches through activities offer new learning strategies adding diversity and flexibility to existing methods and forms of classroom practice.

Each of the approaches can be successfully adopted in the English language classroom either in combination or separately. Learners' needs determined by learners' psychological characteristics as well as other factors influencing the learning/teaching process should be decisive in an approach selection.

Nowadays if we look through new textbooks for learners we can notice that they are written on the base of new teaching methods especially their authors pay more attention to listeningcomprehension, and speaking for developing pronunciation, speech and understanding at the same time of speaking or listening through activities and games. [1]

Using activities advocates teaching practices that develop communicative competence in authentic contexts. However, the theories and practices of CLT have faced various challenges in EFL contexts. Thus, this study explores the effectiveness and importance of activities and games in teaching English to students, with the recommendation that their views be considered in decisions regarding the integration of CLT into our Education system. This means that success of learning a foreign language depends on how well learners have developed their communicative competences and how much they are able to apply this knowledge of language in real life situations.

[1] Brown, Gillian and George Yule. 1983. *Teaching the spoken language.* Cambridge: Cambridge University Press.

To make teaching more interesting and meaningful English teachers use different types of teaching methods and approaches.

In Uzbekistan, the main focus of communicative language teaching (within activities and games) method is to help the learners/students/pupils to learn a language so that they can use it to communicate meaningfully in any real life situation. The methods assume that the learners will be able to communicate socially on an everyday basis or expert English language speakers on finance and business sphere. The communicative approach makes teachers and students consider language in terms of the communicative functions

First of all, the article revealed that implementing role-play activities develops students' speaking skills rather than the other activities. This type of interactive activity is more appealing to the learners because they find it funny to play someone else's role. The majority of the students claimed that they felt that their speaking skills increased. What is interesting, the learners told the teacher that when they used English during an ordinary lesson, some of them felt stressed and intimidated. The teacher also observed that when conducting the research lessons almost all of the students were really involved in the exercises. Investigating this topic we did a questionary with the class before starting the research about role play activities. During the research lessons, the students tried their best to get into the roles and use only English (although there were always some students who despite being told three times not to use the mother tongue they would continue doing so).

Furthermore, some students claimed that they had overcome their fear of speaking because they had quite much time devoted only to speaking in the target language. To add more, the learners also liked the fact that they could move in the classroom when, for example, visiting travel agencies. Also, working in pairs and groups was appealing to the students, because they could overcome their fear of speaking in front of people with whom they did not have a close relationship. Altogether, role-play seems to be an efficient speaking exercise and teachers should not forget to implement such an exercise from time to time. What the students told the teacher after finishing the last research lesson was that such a type of task had many benefits but having such an exercise during each week might be a little boring and predictable for the students. In addition, drama as another type of communicative language activity could always be extended and used as a starting-point for other activities. The theme can act as a stimulus for discussion or written work going far beyond the acting out of scenes. Dramatic activities can thus be integrated into a course, which in turn could lead to them being exploited in terms of the language syllabus, for example the learning of vocabulary, even of structures. As matters stand now, drama and dramatic activities tend not to exist as a special area within the syllabus separate from all other language activities, but they often overlap with them.[1]

Perhaps one of the greatest advantages to be gained from the use of drama is that students become more confident in their use of English by experiencing the

[1] Budden, Joanna. 2004. "Role play", British Council

language in operation. The student-centredness inherent in all dramatic activities also improves students' maturity and motivation, and the physical involvement contained in drama along with the concept of learning language through action is an effective variation on the method of Total Physical Response and other holistic approaches to language teaching, where the learner rather than the language or indeed the teacher is at the centre of the learning process.[1]

Drama in the English language classroom is ultimately indispensable because it gives learners the chance to use their own personalities. It draws upon students' natural abilities to imitate and express themselves, and if well-handled should arouse interest and imagination.

Having had 19 years of work experience as a teacher of English it can be told without any hesitation that role playing and drama activities are the very chance for students to improve their communicative language skills. First when I began teaching at the university I asked my students to use these activities in the form of acting out long dialogues. At those times majority of students were shy, some of them were embarrassed, some of them were afraid of making pronunciation mistakes. But anyway practice makes perfect. From time to time they began to understand and appreciate its importance and preferred to acting out such kind of activities as much as possible. Sometimes topics for their conversations were given to them by the teacher, sometimes it was up to them to choose an appropriate topic for the lesson to communicate with each other. After some months they got used to doing role play activities and found out them very useful way of improving their speaking skills. Through these interactive activities one can improve not only he/her speaking skills, but also one can improve their pronunciation, vocabulary and grammar skills. The most interesting and enjoyable thing which attracts us much is that, our students always wear their role costumes during the activities. It was always noticeable that this helps students feel freely and helps them to improve their critical thinking abilities. Because when they act out role play activities wearing their role costumes it's noticeable that they behave themselves like real characters of their roles and enjoy doing this. Sometimes they wear the doctors', teachers', cook's, shop assistant's or the travel agent's uniform. Sometimes they try to act out the roles of some film star' or singers' roles.

Surely, in order to act out their roles, they have to learn the new vocabulary closely connected with those professions. They try to do their bests to act out their roles better and better every time. In our literature classes our students act out some little episodes from the works of famous writers like Romeo and Juliette by William Shakespeare. While learning Shakespeare the students chose different scenes from Romeo and Juliette for themselves to act out. As they do these activities willingly they can interact freely and can learn the material of the lesson well. At the result we can say without any doubt that these role play activities provide the fruitfulness of the lessons. What we liked, most students do this not only to get good marks, but also for pleasure. Next time when the students act out

[1]Richards, Jack C. and David Bohlke. 2011. *Creative effective language lessons.* Cambridge: Cambridge University Press

the episode from "Othello" by Shakespeare, it was so interesting that everybody enjoyed it. They try to find appropriate role costumes for their roles to make the activity more interesting and more enjoyable.

Sometimes it turns out a contest for them as they do these activities in small groups. Students are usually asked to take the notes of the mistakes if one makes any in order to be able to analyze them at the end. Because they are asked not to interrupt each other during speech activity even in order to correct the mistakes if one makes any. Otherwise, they may forget their words and cannot get a good assessment at the result. That's why, the analyses, error correction should be done at the end. At the end of the lesson when feedback is given the best role play activity of the lesson is chosen.

Drama encourages adaptability, fluency, and communicative competence. It puts language into context, and by giving learners experience of success in real-life situations it should arm them with confidence for tackling the world outside the classroom. Collaborative drama and role playing learning environment provides reflection, negotiation, discussion and team work skills.

Finally, we can say that role-playing activity is a powerful and effective teaching method for learners and can be adapted to deliver any learning objectives from simple to complex concepts. In addition to this we can say that, this learning environment supports pedagogical and practical knowledge. Furthermore, it facilitates to internalize teaching practice. The success lies in the construction and delivery with careful facilitation. It is a great method for teachers and trainers as it is an entertaining activity which makes every student be involved in the process.

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UDC: 81.111’322.5

THE CREATIVE USAGE OF THE ENGLISH IDIOMS IN VARIOUS OCCASIONS.

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Annotation. In this article the English idioms, their meanings and equivalents in English and in Uzbek are discussed. Moreover, there are many examples for phraseological fusion and their literal translation to other languages.

Annotatsiya. Ushbu maqolada ingliz tilidagi iboralarning ma’no va tahlillari, shu tillardagi variantdosllari keltirilgan. Bundan tashqari frazeologizmlarning boshqa tillardagi badiy tarjimalari misollar bilan yoritilgan.

Аннотация. В данной статье представлены значения и эквиваленты английских идиом. Более того, предлагаются примеры фразеологических единиц и их литературный перевод на других языки.

Key words: idiom, metaphorical way, non-literal way, semantic principle, phraseological units, semantic cohesion, word combination.

Kalit so’zlar: ibora, metoforali usuli, noadabiy usul, semantik xossalari, frazeologik birliklar, semantik bog’liqlik, so’zlarning birlashuvi.

Ключевые слова: идиома, метафорический путь, небуквенный путь, семантический принцип, фразеологический элементы, семантический сцепления, слова комбинация.

Here we will analyze an extended idiom. Extended idioms were described in the introduction as being featured in their original form together with an additional piece of text that somehow makes a comment on the idiom itself. This comment is often fairly concise and occurs in direct proximity to the idiom, either directly preceding or immediately following it. The main effect provided by the comment is to draw attention to the literal meaning of the idiom.

Burn the candle at both ends, then get rid of the smoke.

This extended idiom is found in an ad for a product by Comfort called Refresh, which is sprayed onto clothes to remove smells, or as the slogan promises, it “puts freshness back into clothes”. The entire background of the ad consists of a picture of a woman wearing a dress and a cardigan, but it seems to have been cut in two pieces, with the left half showing her at night in a dark and smoky room, her hair slightly disheveled and her cardigan flailing open, revealing the straps of her dress. In the right-hand half of the picture it is daytime, she standing in a brightly lit room with a desk and a computer visible in the background. Her hair has been combed and her cardigan is neatly adjusted. The woman is holding a spray bottle of Comfort Refresh in her left hand, spraying its contents towards the smoky left-hand half of the picture. The idiom itself, burn the candle at both ends, is written across the smoky half of the picture, while the comment, then get rid of the smoke,

is superimposed on the other side. The idiom is partly motivated by conceptual metaphor(s), but it is also possible that conventional knowledge plays a part in forming mental images, at least for some speakers. According to Szabó, the underlying metaphor behind this idiom is energy is fuel for the fire, but it is unclear exactly what they mean and they fail to give a more detailed analysis. Presumably, if we understand energy in terms of fuel for a fire, it means that we need energy to keep the fire burning, in this context perhaps the fire of life. My attempt at an explanation would be that if we burn the candle at both ends, i.e. use up too much energy late at night and early in the morning, there will not be enough left.

Nighttime is when we recuperate and gather more energy, and if that time is cut short there will be no fuel for the fire. However, is it not possible that some other metaphor is involved as well, one that involves time rather than fuel for a fire? One very common metaphor we use in order to understand time is by seeing it as a physical object, sometimes more specifically as a container, which we can move in and out of, as in expressions such as We're well into the century and He's like something out of the last century, or as a moving object. In my view, burning the candle at both ends could be partly motivated by this metaphor as well, if we think of a period of time as a bounded entity or slot that can be shortened at both ends. The candle burning at both ends would then correspond to our night rest being shortened at both ends.[1] Interestingly enough, the reference in this ad is not specifically to the lack of energy that is caused by late nights out and early mornings, but rather it addresses the problems associated with smoky venues and how to feel clean and fresh the next day. The focus is thus not on the short period of rest, but on the short period of time in which you must get your clothes feeling fresh again. What our conventional knowledge tells us, and which could influence our mental images associated with this idiom, is that it is often dark late at night and early in the morning. Being up at these times would therefore require some form of light source, such as a candle, which then would have to be burned at both ends of the day.

Regardless of the exact motivation behind the idiom, it is clear that the element smoke in the comment is grounded both in the literal meaning of the idiom, according to which a candle is burning, and in the wider situation associated with the metaphorical meaning of the idiom, i.e. the knowledge that late nights are associated with going out to smoky bars or clubs, which is information that is partly provided by the picture. Out of context, the idiom would perhaps be difficult to understand, since our attention is drawn to its literal meaning by the comment clause then get rid of the smoke. Gibbs et al., reporting on earlier studies by Gibbs, point out that "people do not ordinarily process the entire literal meanings of idioms," which often results in a "double-take" when they encounter idioms in a non-metaphorical context.

[1]G. Nikolayeva. The Newcomer, F. L. P. H.- Moscow, 1985. -145p.

This is clearly what has been exploited by the makers of the ad in question. When reading the idiom burn the candle at both ends, we are more likely to access the metaphorical meaning, which is why we might react when we get to the word smoke, which triggers the literal meaning. This incongruity draws our attention to the underlying metaphorical mappings, and allows us to access the input spaces. The source domain object/fuel is elaborated as a candle space, which contains the candle, the process of burning, and the smoke, or perhaps rather soot, that results from it. The target domain time/energy is instead elaborated as a nightlife space, in which a person stays out late, frequents venues where people smoke cigarettes, and as a result end up with clothes that smell of smoke.

In the headline, which may be understood as a conceptual blend, both these spaces are activated at the same time, and a humorous effect is created by the double literal interpretation of the element 'smoke' against both the inputs.

A good example of an altered idiom in commercial is following:

Ex. Comfort is in the eye of the beholder

This advertisement one for Focus contact lenses, which appeared in Marie Claire in March, 1997. The main part of the ad is taken up by a picture of a woman dressed in a white knitted polo jumper, cuddling a fluffy toy animal that might be a teddy bear. The headline above the picture is written in white against a green background and reads Comfort is in the eye of the beholder, a variant form of the idiomatic expression or proverb *Beauty is in the eye of the beholder*. [1]As with the previous ad, the headline is ambiguous and may be interpreted both literally and metaphorically. Again, the fact that the idiom has been altered triggers the otherwise non-salient literal meaning, but perhaps not as strongly as in the previous ad, since Comfort is in the eye of the beholder may actually be understood in an entirely metaphorical sense, as opposed to Don't get your panty liners in a twist, where a literal interpretation is inevitably highlighted.

This is the original idiom, which is partly motivated by the conceptual metaphor 'feelings are objects' or in this case rather personal characteristics or abstract notions are objects. Being seen in terms of an object is what enables beauty to be located in different places, in this case in the eye of the beholder as opposed to in the face of a woman. Fittingly enough, contact lenses are also objects that are located in the eyes of some beholders, namely those with poor eyesight. The source domain objects is elaborated as a more specific space, which will be referred to as lenses, and it includes the simple scenario in which lenses are worn or placed in a person's eyes. In addition, we can identify two elaborations of the target domain feelings/ characteristics, where one may be labeled comfort and the other beauty. In the comfort space, there is the feeling of comfort, which exists in the opinion of the person experiencing the event, while in the beauty space; there is the characteristic of beauty, which exists in the opinion of the observer. In the altered idiom in the headline, all these spaces are activated simultaneously, and contribute to the understanding of what it means to use the Focus lenses. Not only

[1]German Y., "The Cause You Serve", F.L.P.H., Moscow. 1997.-237

will they improve a person's eyesight, they are also comfortable for the wearer and make her/him look good in the eyes of other people. Moreover, all three input spaces may be understood to be reflected in the image, in particular the comfort space, to which the warm jumper and cuddly toy belong, but perhaps also the beauty space, which in that case is reflected in the face of the woman, and possibly also the lenses space, if we assume that the woman in the ad is wearing them. However, they are also signaled in the text or slogan at the very bottom of the ad, which says "see better," "feel better" and "look better," and these are of course linked to the three different input spaces lenses, comfort, and beauty.

The altered idiom in the headline may also be seen as a comment on the image, which actually illustrates some examples of what comfort may involve, but at the same time asks what it really means for something to be comfortable. Is it wearing a warm jumper and cuddling a fluffy toy as the woman in the picture is doing, or is it something else? That is all up to the beholder, which of course carries a possible negative implication as far as the aim of the ad is concerned. Are the contact lenses really comfortable or is that also, metaphorically, in the eye of the beholder?

The role played by metaphor and conceptual blending in these creative examples shows that advertising language follows the same cognitive principles as everyday language, but many processes, which are normally unconscious and therefore largely go unnoticed may be highlighted and made more noticeable.

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УДК: 811.111'373:641/642.811,512,133'373:641/642

TRANSLATION EQUIVALENCE RATE OF ENGLISH LEXICAL STYLISTIC DEVICES USED IN THE BOOK "SPY" BY F. COOPER

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Аннотация: Equivalences of lexical stylistic devices are analyzed from samples of the book "Spy" by F. Cooper. In the process of translation attention is paid not only to expressive meanings, but is tried to express the images emotionally.

Аннотация: Лексик-стилистик услубларнинг таржимадаги муқобиллари Ф. Куперниng "Жосус" асаридаги мисоллар кўриб чиқилган. Бадиий

таржима амалиёти жараёнида нафақат маънони бериш, балки тасвирий воситаларни айнан муқобилини беришга қаратилган.

Калит сўзлар: лексик стилистик услублар, таржима, муқобиллик, мослик, даража, мувофиқлик

Key words: lexical stylistic device, translation, equivalence, conformity, rate, combinability

Ключевые слова: лексико-стилистические обороты, перевод, эквивалент, уровен, согласованность

In modern Uzbekistan there are basic changes in spiritual sphere and bases of new ideology are actively formed. And foreign languages began to be taught deeply and thoroughly in every town and village of the country.

The purpose of translation is closer acquaintance of the reader or the listener who does not know language of the original, with the text being translated. "To translate means to express precisely and full means of one language that is already expressed by means of other language in indissoluble unity of the meaning and the form"[1].

The urgency of work

Translation has played and plays a key role in the development of world culture. It is common to think of culture as national and absolutely distinct. If we begin to examine the impact of literary translation, the possibility of communication beyond anything so confined by geographical location is clear.

While discussing the lexical problems of translation we considered lexical-semantic features of both languages and investigated such cases as difference in word volume, word combinability, generally accepted tradition of word usage, we have also considered contextual meaning of words in the process of translation. In addition we investigated the emotional coloring that plays an important role while processing a translation of stylistic devices. We have studied the translation of expressiveness of the words and unexpected usage of word combinability that makes the translation task harder.

During translation the words most close to corresponding words of the original in their interrelation and in their conformity to sense of the whole offer get out. It is natural, that such choice cannot be carried out without taking into account a context, and the context plays here a main role. Thus it is necessary to consider, that the dictionary structure of language is not easier set of words, and system and consequently not all combinations of words can be admissible in the certain context. Between elements of the dictionary there are semantic and stylistic attitudes which the translator should consider.

The translations of stylistic devices are divided into three cases when it is necessary to make a choice between several possible translations of a word.

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[1] **Феодоров А.В. Искусство перевода и жизнь литературы. - Л., 1983, -58**

The first case is an absence of dictionary conformity for a word of the original, or absence of conformity for the used concrete value of this word. The third is conformity of different words of language of translation to various word meanings of language of the original.

At translation equivalence of such type the lexical organization of translation can and cannot coincide with the original completely. As examples, here it is possible to carry translation of the majority of lexical stylistic devices:

1. "The whole party were deeply impressed with the ingenuous and solemn manner of the travelers, and all but the father found immediate relief in his declaration" (59).

"Прямодушие и серьезность незнакомца произвело глубокое впечатление на все семейство, а его слова доставили всеми, кроме отца, большое облегчение" (35). [1]

"Нотаниш меҳмоннинг очиққўнгиллиги ҳамда жиддийлиги хонадондагиларнинг барида, чуқур таасурот қолдирдию унинг сўзларидан эса отадан ташқари ҳаммалари, худди елкаларидаги тегирмон тоши олиб ташлангандек, ниҳоятда енгил тортдилар" (43).

The case when conformity completely is absent, meets not too often. Basically, it occurs when the word of the original designates a subject or concept, characteristic for a life of certain people, and absent in a life of people in which language translation is done. But it does not mean that the sense of such word cannot be transferred. Its value can be presented, not in a word, and several. As many words, especially in the translation of stylistic devices, in due course find the certain conformity in language. And here the words designating usual subjects and having incomplete dictionary correspondence, usually do not find new means of transfer. For example, I observe this kind correspondence in simile and pun:

Simile

1. *"His presence and word acted like magic"* (105)

"Его вид и слова произвело магическое действие"[2]*(*69)

"Унинг важоҳати ва сўзлари сеҳрли таъсир кўрсатди."[3]*(*97)

2. "*And the troublesome times Trouble is heavy pull down to a sick bed*" (146)

"*Шу қатори хавотирланиш, ташвишларга тўла замон ҳам. Ташвиш-хавотир касал одамни адо қилади.*" (141)

Pun

"Poor fellow! He lay on his back and looked as composed as he had died a natural death after a year's consumption.

-Oh, Michael was a great consumer" (Ф.Купер 2,226)

"Бедняга! Он лежал на спине, и лицо у него было, такое спокойное точно он умер натуральной смертью, без просыпу.

-О, Майкл был истинный пропойца." (Ф.Купер 3,160).

[1] Купер Ф. The Spy. «Прогресс», 1975, -105

[2] Купер Ф. Шпион. Перевод с английского Э.Бер, Е. Шишмаревой, Минск «Юнацтва»,1991.

[3] Купер Ф. Жосус. «Шарқ»,1995

“Бечора! У чалқанчасига ётар, юзи нақ бир йил бетўхтов ичиб, ўз ажали билан ўлган одамнинг башарисидай хотиржам кўринарди.

-*О, Майкл , чинакам майххўр эди.”* (Ф.Купер 4,238)

In the given example we come across the words “*consumption”* and “*consumer”*. On the one hand, we compare “*natural death”* and *“consumption”* which does not coincide each other by meaning and the other hand, “*consumption”* and “*consumer”.* In the second sentence the meaning of the pun is cleared. We know that the word “*consumption”* has two meaning: 1. illness and 2.drinker. The author expresses his attitude toward the events skillfully with help of the pun.

If the translator has given the meaning of illness instead of drinking, he would have achieved more success in the translation.

The results achieved and their novelty: In the given article I have investigated various translation methods of lexical stylistic devices from English into Uzbek. Moreover, I’ve studied the translation methods of lexical stylistic devices at a deeper level, the types and ways of translation of language. 3 Levels or types of equivalence are based on what part of the maintenance is transferred in translation for achievement of its equivalence. I have given 3 levels of translation equivalences of lexical stylistic devices on examples and

I can say that the third type of translation equivalence i.e. complete conformity contains functions of lexical stylistic devices in translation.

Used literature:

1. Ф.Купер. The Spy. «Прогресс», 1975.
2. Ф.Купер. Шпион. Перевод с английского Э.Бер, Е. Шишмаревой, Минск «Юнацтва»,1991.
3. Ф.Купер. Жосус. «Шарқ»,1995.

UDC: 338.4.4.003.1(575.1)

BASES OF CONSTRUCTION OF COMPLEX VARIABLE ECONOMETRIC MODELS OF REGIONAL ECONOMIC SYSTEM

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Annotation. This paper considers construction problems of complex econometric models of regional economic system at an example of the Khorezm region.

Аннотация. Мақола минтақада иқтисодий тизимни комплекс сонли эконометрик моделларини тузиш асослари таҳлил қилинган.

Аннотация. В статье рассматривается вопросы построения комплекснозначных эконометрических моделей региональной экономической системы на примере Хорезмской области.

Key words: region, regional economy, regional economical system, complex numbers, production function, mathematical models, complex valued econometrical models, methods of optimal regulation, econometrics.

Калит сўзлар: минтақа, минтақавий иқтисодиёт, минтақавий иқтисодий тизим, мажмуали сонлар, ишлаб чиқариш функциялари, математик моделлар, комплекс аҳамиятли эконометрик моделлар, оптимал бошқарув усуллари, эконометрика.

Ключевые слова: регион, региональная экономика, региональная экономическая система, комплексные числа, производственные функции, математические модели, комплекснозначные эконометрические модели, методы оптимального регулирования, эконометрика.

In recent decades the globalization process of regions' successive socio-economic development is becoming an urgent matter. In developed and developing countries' large regional centers account for 75% of the world GDP, about 58% of export and 76% of the investments[1]. This requires searching for optimal methods for more efficient development of regional economic systems.

In our country structural changes done in socio-economic development of the regions and accepted projects of complex development of regions, as results of effective regional policy have been held ever since independence. At present, to ensure their implementation it is required to improve mechanisms of management and regulation. As President of the Republic of Uzbekistan Sh.M.Mirziyoev emphasized "In the focus of such system there should be perspective important tasks related to comprehensive development of not only the basic sectors of the

[1]The share of regions of the countries-members of the EU, NAFTA and APEC. Source: World Bank, 2014, http://www.databank.worldbank.org (last address: November 07.2016й).

economy, but also and first of all, of the regions, as well as ensuring the pivotal interests of our country's all citizens and raising their incomes[1]".

It provides for an integrated territorial development, rational use of available natural resources of regions, industrial and labor potential, the optimal distribution of labor forces, increase the level and quality of population lifestyle, and for this purpose, it suggests perfection of the institutional framework to improve management efficiency. Therefore, the solution of such problems is needed for innovative approaches to the application of modern econometric models in optimal regulation of the economic system of the region.

The experience of developed and developing countries (US, Germany, Japan, China, and others.) showing that the diversification and modernization of the economy, improving the competitiveness of the regions, ensuring dynamic economic growth requires more efficient use carried out research in the field of optimal management and regulation of this process.

Today, Uzbekistan is implementing a program to ensure a comprehensive and balanced development of the territories, the optimal use of production and labor potential, natural resources of regions, reasonable distribution of labor forces and gradually increase the level and quality of population well-being, as well as implement system program activities to improve and enhance the effectiveness of local executive authorities. In these purposes creation of econometric models based on the effective production of complex functions gave opportunities to get solution to existing problems in this area.

According to our opinion, the regional economic system is a system that has a certain spatial sizes and is an integral part of the economic system as a whole.

It includes the operation of the economic system and labor potential, efficient allocation of labor forces, the level and quality of lifestyle of population, activities of local authorities. Regional economic system, as a special integral subject of the evolutionary process has the capacity to produce products, by itself provide their exchange, distribution, consumption and management of their development.

Regional economic system has a complex structure, developed in conditions of uncertainty and ambiguity. In this regard, in order to improve the mechanisms of regional economic system, we firstly put forward a proposal for the application of econometric models with complex variables.

S.G. Svetunkov[2] described that, "…complex variables production functions income (G), expenditure (C), main production resources (L) and capital (K) are mutually related". T.B. Merkulov and F.I. Prixodko[3] in their research stated that, "advantage of econometric model with complex variables is that it can help to

[1]Address by Shavkat Mirziyoyev at the Joint Session of the Chambers of Oliy Majlis dedicated to a solemn ceremony of assuming the post of the President of the Republic of Uzbekistan// newspaper "Xalk suzi", 15 December, 2016, № 247 (6682)

[2]Svetunkov Sergey. Complex-Valued Modeling in Economics and Finance – Springer Science + Business Media, New York, 2012. – 318 p.

[3] Merkulova T.V., Prikhodko F.I. Dynamics of macroeconomic indicators modeling by functions of complex variables // Бізнес-Інформ (Бюлетень ВАК України) // № 4 (5) 2010 (381). С. 67 –71.

solve the important tasks that are could not be solved real variable functions, to bring the regional system to the optimal regime that is considered the most important factor".

The various elementary functions with complex variables gave opportunities of modeling such non-linear relationships, which have no analogues in real variables econometrics or analogs in using real variables because of their complexity that their practical use does not make sense. Thus, using the basic models with complex variables significantly expands the instrumental basis of econometric studies.

As known, complex number variables are divided into two parts: real and abstract parts.According to the rule of production factors, the function distinguishes two main resource domains[1] – capital resources K and labor resources L. Result could be any indicator of production activities (volume of production in natural or value form, trade volume, gross income and others).

Complex number of variables was designed according to the following rules: real part – capital, abstract part – labor resources, complex number arguments of these functions take the following form:[2] $K_t + iL_t$ t-time indicators.

In order to form a complex variable production results, requires a couple of variables that reflect the different sides of the same process and having the same dimension and scale.

Since different combinations of productive resources in the enterprise, lead to a different combination of production costs and gross profit, consequently, to different volumes of gross production and profitability, the parts of a complex-variable production results should act exactly the variables gross margin G and production costs C.

Complex variable production results, which includes the gross output G and production costs C is having a following tructure[3]:

$$Z=G+iC \quad (1)$$

Where i – abstract unit, well known mathematic rule. New number Z – indicates two variables – gross profit G and production expenditures – C, because they constitute inseparable parts of constructed complex number. The meaning of this is the researcher working with complex variables using two real variables.

Therefore, on the one hand the union of two economic indicators in the same model with complex variable allows us to use complex-valued variables, on the other hand makes it possible to include the economic mathematical model giving comprehensive information about the object.

Here, the assignment of gross profit in the real part and cost in an imaginary part of complex-variable production resources not done by accident. This order is determined by the rules of formation of complex-variable inputs.

As it is known, the basis of any modern model of economic dynamics is the production function. All classical production functions: exponential, logarithmic,

[1]Б.В.Шабат. Введение в комплексный анализ. Функции одного переменного: Учебник: В 2-х ч. 4-е изд., Спб.: Лань, 2004. -326с.

[2]Светуньков С.Г. Основы эконометрии комплексных переменных. - М.: Санкт-Петербург 2008.

[3] Светуньков С.Г. Основы эконометрии комплексных переменных. - М.: СПб, 2008.– 108 с.

linear and commonly known Cobb-Douglas production functions are not only comfortable instrument for economic analyses, but also commonly used in modeling economic dynamics. Because with the help of them modelled enterprises, regional and whole country's any level production processes, or used as an important element presenting transformation of resources into results.

The advantage of the production functions with complex variables, compared with production functions with real variables is that they are more deeply and comprehensively reflect the production process. In this regard, the econometric models with complex variables provide the accuracy and reliability of production processes.

Based on conducted researches, we could give following conclusions:

1. Analysis no optimality of control forms and methods of interaction of social, economic, political and ecological processes of regional economic systems have shown that in the conditions of modernization of the country, the formation of an innovative economy, ensuring sustainable growth is necessary to improve government mechanisms

2. Using completely new econometric models with complex variables in the learning of regional economic system allows: to conduct a systematic analysis on structural basis the level of regional social and economic development; to identify the current imbalance in resources, underutilization of mineral raw materials, labor resources and production capacities; to elaborate short and long term regional complex development programs; to determine deep structural changes in regional economies.

3. The main objective of econometrics with complex variables is the study of econometric models with complex variables and identify opportunities to use it describing analysis and forecast the real economic processes. The basic properties of models with complex variables is that the predicted values are calculated by the previous forecasted values, but adjusted for the fact of deviation from the forecast.

4. A method for constructing classifying production function with complex variable type Cobb-Douglas with a sufficient degree of certainty allows to analyze current situation and to develop practical recommendations for the management and regulation of the regional economy.

5. Creation of complex variable econometric model of economic system of the region and forecasting regional development indicators based on it is just one-step in the development of the complex numbered economy. Using cost-effective economic-mathematical models will become an integral part companies', sectors', countries' and the global economies.

UDC: 338.467.6

OPPORTUNITIES OF USING NATURAL PRESERVED AREAS IN DEVELOPING TOURISM

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Annotation. The article deals with the country's reserves which are not used for touristic purposes and their possible use in the development of tourism.

Аннотация. Мақолада хозирги пайтда туризм мақсадларида фойдаланилмасдан келинаётган табиат қўриқхоналари, уларнинг сайёҳлар эътиборини тортадиган жойлари, улардан туристик мақсадларда фойдаланишнинг имкониятлари келтирилган.

Аннотация. В статье рассматривается заповедники страны, их туристические достопримечательности, которые не используются в туристических целях и возможности их использования в развитии туризма.

Key words: tourism, nature reserves, national parks, tourist infrastructure, economic activity, visitors, ecology, excursion.

Калит сўзлар: туризм, қўриқхоналар, миллий боғлар, сайёҳлар, туризм инфратузилмаси, хўжалик фаолияти, ташриф буюрувчилар, экология, экскурсия.

Ключевые слова: туризм, заповедники, национальные парки, туристическая инфраструктура, хозяйственная деятельность, посетители, экология, экскурсия.

Uzbekistan has one of the most beautiful natural landscapes in the region and most of their parts are protected by governmental preservations. Before, people could visit mountains, walk through trails and organize picnics but, in recent years, in order to save the beauty of these areas, they started being preserved and many restrictions have been put to visit those places[1].

Special natural preservation areas include nature reserves, natural monuments, and preserved areas of forests, national parks and preservations. The main purpose of establishing these areas is preservation of valuable natural sites, namely, flora and fauna, and hydrologic, geologic and complex landscape sites.

The uniqueness of these natural sites define their value for educational tourism, which then will indicate the need for recognizing special natural preservation areas as important natural recreational resources and using them for purposes of tourism.

Special natural preservation areas are significant for the natural recreation capacity of the country. Governmental nature preservations are reservation, research and eco-educational institutions that focus on preserving and exploring natural processes and occurrences, genetic accumulation of flora and fauna, separate types and groups of animals and plants, traditional and unique environmental structures.

[1] New opportunities for tourism in the Republic of Uzbekistan: express-evaluation. March 2013. World Bank Group.

Preservations are institutions that protect natural sites that have peculiar environmental climate, preserving nature for scientific and educational purposes.

Unlike national parks, preservations are very limited for recreational uses and they are mainly used for educational purposes. Usually preservations are educational ecologic areas that have strict paths for touristic groups for introducing natural characteristics of the complex and natural museum.

National parks are nature preserving and educational research institutions that comprise natural site that have special ecological, historical and aesthetic value for educational purposes[1].

Lands, waters, subsoil, flora and fauna in the territory of national parks are granted to the parks for use according the rights mentioned in the republic's laws. The rights to use historical and cultural objects are provided to parks by government organizations on preservation of historical and cultural heritage.

In abroad national parks is one of the common types preserved natural areas. Including, history of development of some national parks in the USA exceeds hundred years.

It is possible to divide national parks into following zones with different tasks taking into account historical-cultural and other peculiarities:

- familiarization tourism zone, mainly aimed at establishing ecological knowledge and familiarization with famous destinations within the park;
- recreational zone, aimed at having a rest;

Natural heritage can also be added to the category of preserved natural areas. This category of preserved natural areas is very common.

Uzbekistan's conservancy areas are also full of interesting and beautiful places that can attract many tourists. State conservancy area called Chotkol. This area is very picturesque and has a range of mountain peaks situated 4600 m above sea level. Mountain ravines are very deep, crystal water flows in these ravines. Famous places in the conservancy area are wall-paintings that illustrate hunting of wild goats in Boshqizilsoy and Teraklisoy. There is museum at the sanctuary's administration building in the city of Parkent that shows the history of natural preserved area and also beauty and richness of the nature.

State sanctuary of Zamin. One of the attractive places of the preserved area is huge red stones located in the pasture of Qizil-otasoy with unusual forms that remind sphinxes. Local residents call this place as "Qirqqiz". Forms have a structure of conglomerate and sandstone. They are very well polished, there are some big and small cracks and bushes are coming out of these cracks. In recent years taking into account rich tourist recourses of the preserved area, it was changed to Zamin national park. Nurota state sanctuary was formed in 1975 in order to preserve one of the rare species of animals Svertsov ram and precious type of Greek nut. On the slopes of Ashraf there are paintings on the rocks that illustrate image of hunting on mountain rams and remains of ancient villages. The largest tree in the territory of preserved area is East's biota that is grown alongside the Majrimsay, the diameter of the body of the tree is 8,5 meters. There are many

[1]Kuskov A.S., Golubaeva V.L., Odintsova T.N. Recreational geography.UMK.Saratov, 2004.

myths and legends about this tree. Local people considered the tree as sacred from ancient times, and worshiped it. There is Archa-ota mosque near the tree.

Kitob geological preserved area is the only one in CIS, in this sanctuary scientific-geological activities are carried out that are not performed in other sanctuaries. Kitob geological sanctuary has become international etalon. The area of the sanctuary has an ethnographic importance; there are remains of two ancient fastnesses in the village and caves where primitive human beings lived.

It is possible to use this area that has geobiological and historical-archeological importance for eco-tourism purposes together with preservation and research. Lower Amudarya state biosphere reserve was created on the base of Baday-tuqay sanctuary. Sanctuary was established to preserve riparian forests and animals. Walls of fastness Kampirqala are considered as attractive. In 1975, for the acclimatization purposes deer from Bukhara were brought to the preserved area and after breeding their number exceeded a thousand at present time[1].

There is a good opportunity of utilizing these natural preserved areas of Uzbekistan in order to develop tourism sector. It is known from the world experience of tourism development that tourists prefer "adventurous" time spending such as walking along picturesque places, cycling in the mountain areas, sailing on the boat in the mountain river. Despite the permission for specific types of tourism activities in the remote areas around the preserved areas of the republic, in their area any kind of economic activities are prohibited.

In other places of the world, especially in African countries located in the south part of Sahara desert, special permissions are provided to local and visitors for safari tours, besides that tourists can enjoy local natural places[2].

Allowing restricted economic activity (for example, tourism) is one of the sources of funds that go to the maintenance and activities of natural preserved area. There is an open access (usually with control) for visitors to the enduring areas against negative externalities, and most of the times vulnerable places to the negative externalities are provided with strict control and only visitors with special permissions are allowed to see the flora and fauna of the area.

Best practices prove that these types of services will be delivered by private sector that has a license and follow high ecological standards. Giving for a rent cottages provided by the state will be common practice. It is possible to apply this practice in other sanctuaries.

[1]Nature Reserves of Uzbekistan, 2005.

[2] New opportunities for tourism in the Republic of Uzbekistan: express-evaluation. March 2013. World Bank Group.

UDC: 330.142.23.330.564.6

SPECIFIC FEATURES OF RELATIONSHIP OF BUSINESS AND SOCIAL ENTREPRENEURSHIP

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Annotation. This paper looks through characteristics of entrepreneurship, social entrepreneurship, as well as their interconnection with the business activity, human and social capital.

Annotatsiya. Ushbu maqolada tadbirkorlik, ijtimoiy tadbirkorlik xususiyatlari hamda ularning tadbirkorlik faoliyati, inson kapitali va ijtimoiy kapital bilan o'zaro bog'liqligi to'g'risida so'z yuritiladi.

Аннотация. Вданной статье речь идёт об особенностях предпринимательства,социального предпринимательства,а также и их взаимосвязанностях с предпринимательская деятельность,человеческом капиталам и социальном капиталам.

Key words: entrepreneurship, social entrepreneurship, social environment, human capital, social capital, middle class, non-governmental and non-profit organizations.

Kalit so'zlar: tadbirkorlik, ijtimoiy tadbirkorlik, ijtimoiy muhit, inson kapitali, ijtimoiy kapital, o'rta tabaqa, nodavlat-notijorat tashkilotlari.

Ключевые слова: предпринимательство, социальное предпринимательство, социальная среда, человеческий капитал, социальный капитал, средний класс, неправительственная, некоммерческая организации.

The stage of the modernization of the economy and the social market economy, the priorities of the country's socio-economic reforms aimed at the development of small business and private entrepreneurship, for further improvement of business performance of the employed population in level of the middle class of the society and the improvement of human potential. The first President of Republic of Uzbekistan Islam Karimov noted that "Issues related to the development of the social sector, to improve the level and quality oflife of the population will continued as a central part of our attention" [1]. Entrepreneurship is a locomotive of the country's economy, as this sector is serving to increase the income of the population, material and financial support in a rapid and cost-effective way, is making a positive solution to the problem of unemployment, in line with the sustainable development of the national economy and well-being of the population. For the further strengthening of entrepreneurship in the social and economic importance the country's legislative base is fully formed [2, 3, 4, 5, 6, 7, 8, 9].

Business form of a new approach to the solution of social problems is social entrepreneurship. *Social entrepreneurship* is a prospective sphere that is connected with the concept of entrepreneurship and business activity, but unlike them, served to create social value and social effect. Doing research in this sphere is important as there have not done enough detailed researches in Uzbekistan.

In the condition of market economy, widely development of entrepreneurship and its various trends have been played important role in economical, as such as social life. In particular, the idea of entrepreneurship, especially in the areas of social entrepreneurship has become considerable issues among outstanding economist scientists. Including, Jean Baptiste Say assisted that there has been strong relationship between initiator entrepreneurs who can positively affect in the process of production by finding new and quality way on their economic activity with social entrepreneurs who can direct their social-economic projects at improving society needs and its social conditions based on the principles of economy. Famous scientist Joseph Schumpeter, who analyzed scientific-theoretical directions of the development of entrepreneurship by innovation, defined the notion entrepreneurship as a social-economic process, which could create "new combinations" of means of production. His main concept is innovations and the targets of this concept based on product quality, new productions, servicing, opening new areas of markets, developing production of new types of resources and raw-materials, especially, creating a social-economic system innovation for the needs by developed new methods.

The dependence of entrepreneurship and social entrepreneurship, an important aspect of business and the specific features have been expressed in the researches of those outstanding scientists. In present period, researches gave lots of descriptions to express entrepreneurship and its social tendency which could be the main factor of socio-economy development of society [10, 11].

Looking through the researches done in this area generally, we conclude to give definition for social entrepreneurship as fallowed:

Social entrepreneurship – is finding innovative solution of social problems, economic activity that based on solving social problems by entrepreneurship in society.

Social entrepreneurship is not unresponsive to social problems, and they would find a solution with innovative ways to make the initiative, dedicated, enterprising individuals. At the same time, it should not be disclaimed the mutual dependence between entrepreneurship and NGO (third-sector) social fields which based on creating social value of necessary goods and services as well as supporting it. This mutual dependence is caused of separating its social aspects and characteristics of entrepreneurship. For example, social circumstances, social activity involvement in social-economic cycle and finally human capital that is a key factor and others. If it is considered that *social environment of business* is the surrounding material, social and spiritual conditions that is necessary for a business formation, functioning and development of entrepreneurship, so *social activity of business* is an independent socio-economic and spiritual movement of entrepreneur

entities that is directed at finding alternative solutions of social and economic issues in society. Distinguish between the characteristics of them is accomplished through the rates of socio-economic and spiritual benefits. It should be noted that the gradual development and connection could reduce the differences between them. Especially, the mechanism of management of social entrepreneurship, which is formed through the basis of social environment and social activity, further expand in this route that providing the movement of the cycle of economic and moral incentives and increase the prestige of entrepreneurs in society.

Entrepreneurship, including its modern direction, social entrepreneurship develops a consistent influence on the prosperity of the middle class. It can raise the profile of this asset class through growth their socio-economic potential in the society and an increase in human capital funding. Because in the civilized, the highest level of a market economy, its high rates of growth are related to human capital who can ensure the competitiveness of economy, particularly training specialists with the knowledge and skills in the field of education.

The increase in the allocation of funds for human factors can cause of expanding the number of entrepreneurs, especially, social entrepreneurs, who the more active parts of middle class, encourage their activity, improve the environment and stimulate their economic and social lifetime [12]. This main factor caused to group again active entrepreneur proceedings, which has appeared in development of middle class and has increased specialization [13].

Nowadays as described above, the difference between entrepreneurship and social entrepreneurship has been analyzed in reasonable way. Social entrepreneurship distinguishes from traditional entrepreneurship by two methods.

Firstly, they benefit from business activity including social liability and responsibility. They can provide to deliver necessary environmental clean product for society, to improve the state of the environment, to reduce the social and economic conflicts, contradictions between rich and poor class, including a big difference in the level of income, to increase the share of the middle class and to decrease poor share in society and the tensions between the community and the nature. They try to solve socio-economic problems in community by supplying economic development immediately. In the activity of social entrepreneurship, it is primary feature that protecting human and society benefit, and they have engaged in entrepreneurial activity by ideas and opportunities, which can enable us to achieve the goal that aim to solve social issues. However, these targets were observed to be in tandem with efforts to increase revenue.

Secondly, likeness traditional entrepreneurship, social entrepreneurship carries out the management of its activities in the social and economic results and the largest part of the activities resulting from the effects are spent on solving socio-economic problems in human capital.

Qualified highly specialists who embody general information, special knowledge, skills and the rich experience of activities in business sphere and the part of human capital objects are one of the most important factors. Including, it clearly affects the basis of clear signs of differences between active business

participants by the expansion of the scope of business activities and increasing the areas of specialization. In addition, with the meaning of the concepts in this area, the professional differences among highly qualified specialists who actively engaged in the field of entrepreneurship must also be taken into account. For example, in the field of entrepreneurship, to understand the essence of the concept of social entrepreneurs, innovators and professional managers can help improving the efficiency of socio-economic governance in the sector.

Social entrepreneur is an emblem of initiative and selfless businessman who can use efficiently the strategy of collection revenue and takes place in socio-economic activities that aimed at solving social problems.

Innovator is interpreted as a dreamer entrepreneur who has his own symbols and ideas, and providing with financial sources of his innovative ideas his activity is based on cooperation and partnership with financial institutions, which have great financial capacity in these ideas and not fear of the danger of innovative, sympathies sponsors and business income on developing this sphere.

Professional managers are entrepreneurs who could provide effective management of economic activity. Only highly qualified stewards could implement such management by expanding the capacity of its infrastructure and prospects, and making the effective duration of the activity.

In conclusion, it is said that entrepreneurship and social entrepreneurship are interrelated concepts, and both of them will serve to increase the potential of human capital, improve the living conditions of the population and the socio-economic interests. To improve legal framework in support of social entrepreneurs by the state, and use public funding efficiently provide economic stability.

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UDC: 338.4.4.003.1(575.1)

COMPETITIVE ADVANTAGES OF THE REGION IN DEVELOPMENT OF PRIVATE ENTREPRENEURSHIP AND SMALL BUSINESS

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Annotation. The article considers the competitive advantages of the region in development of private entrepreneurship and small business.

Аннотация. Мақолада минтақада кичик бизнес ва хусусий тадбиркорликни ривожлантиришда рақобатбардошлик устунликлари тахлил қилинган.

Аннотация.В статье рассматриваетсяконкурентные преимущества региона в развитии малого бизнеса и частного предпринимательства.

Key words: region, regional economy, business struggle, small business, private entrepreneurship, competitive advantages, potential of entrepreneurship, handicraft trade, business-plan, business-projects, business initiative.

Калитсўзлар: минтақа, минтақавийиқтисодиёт, рақобат, кичикбизнес, хусусийкорхона, рақобатафзалликлари, тадбиркорликсалоҳияти, ҳунармандчилик, ишрежаси, бизнес-режалар, бизнесташаббуси.

Ключевые слова: регион, региональная экономика, конкуренция, малый бизнес, частное предпринимательство, конкуренция преимущества, предпринимательский потенциала, ремесленничество, бизнес-план, бизнес-проекты, предпринимательской инициатива.

The general condition of small business and private entrepreneurship (SBPE) in the Khorezm region can be characterized as stable positive dynamics of development in all areas and sectors of the economy. The region has a unique entrepreneurial potential by reason of historic traditions, industriousness, moderation, organization, creative thinking and a tendency to know-how, as well as other characteristics peculiar to its population. Development of local initiative and enterprise distinguishes the population of the region from neighboring regions (Bukhara, Navoi regions and the republic Karakalpakstan) and is one of the main competitive advantages.

The region has a long tradition of craftsmanship and the basics of handicraft production of goods of light industry, food industry (carpet weaving, embroidery, etc.), wood products (furniture, windows, doors, cutting wood, etc.). It is the high local entrepreneurship in the development of new types of products creates conditions for integration SMPE in organized forms of industrial production

An important attention in the development of small businesses is dedicated to preserving and transmitting the generated centuries-old traditions of craftsmanship: artistic forging (carving, chasing and engraver) on metal, copper chasing (kandakorlik), production and masonry facade mosaic (koshinchilik), weaving and embroidery, gold embroidery, patterned knitting, carving and art processing of a tree (duradgorlik), pottery, production of ceramics, carpal painting (nakkoshlik), sewing of national skullcaps, a national architectural design (memorchilik), shoemakers (etikduz) and many others .

Arts and crafts – hand carpet weaving has a long tradition, and successfully developed, differing in ornamental motifs and technique of execution in almost all rural areas of Khorezm region. But it is especially famous for the beauty of patterns, color combinations and mastery of execution of silk and wool rugs done by masters of Khiva.

The concentration of home carpet allows to stimulate the development of this activity in the form of new forms of entrepreneurship – cottage industry and family business. High quality and generated strong demand, both domestic and foreign markets for the products of handmade carpet weaving Khorezm region, represents

another competitive advantage in the region. Character development through home-based carpet allows you to link fragmented activities and to develop on its basis of the organization of small businesses.

In general, the field of small business is developing successfully in all fields of industrial production, but more specialized in labor – intensive types of products for the production of food, light industry, construction materials and engineering products. Meanwhile, there is insufficient activity of small business in the production of pharmaceutical, electronic and tannery and footwear products.

The important role of small business in economic growth confirmed their significant contribution to the formation of the region's GDP, whose share was 73.8% in 2013 (when the national value - 56%) is higher than in 2005, more than 20 pp. A high specific gravity of SBPE in GDP was achieved through the scope of activity of subjects in products of agriculture, industry and services, the contribution of which can be distributed as more than 30%, 9% and 28%, respectively. An important contribution of small business in GDP, also contributed to the increase in the number of active small businesses in the Khorezm region in 2,7 times in comparison with 2005.

With the theme of under used existing regional industrial reserves in the rational and efficient use of the capacity of SBPE in terms of involvement in the industrial revolution rich natural resource potential. For example: the development of deep processing of agricultural products (fruits, vegetables, silk cocoons, cotton fiber, etc.). In addition, it is poorly realized that the potential for increasing employment in small business and private entrepreneurship, which is incorporated in the organization of related systems for the processing of agricultural products, the organization of its storage and transportation, setting up production of consumer goods on the basis of local raw materials in small workshops.

Also it has a great potential in industrial production sectors such as the processing of imported mineral resources in the area, and the production of light and food industry through the formation of a whole range of related small businesses in a single production chain.

While the unique climatic and geographical Khorezm conditions allow specialized agriculture in the cultivation of high-vitamin-enriched and mineralized apples (Karvak OLMA), grapes, figs, apricots, tomatoes, yellow carrots, cantaloupe, pumpkin, rice, onions, licorice root and other crops as well as meat and dairy products, silkworm cocoons that allows them to establish a process of in-depth processing and packing. Of course, this is a competitive advantage in the development of SBPE relative to other regions of the country.

The high share of sectored structure of the region and the predominantly small business development in agricultural production is due to traditional agricultural oriented areas of Khorezm region and the lack of development of the necessary market infrastructure that would promote the development of small business in the production of finished products and deep processing of agricultural products.

High costs generated by the participation at the international, national (especially in the city of Tashkent) and regional exhibitions and fairs hinder small

business development and promotion of goods produced outside the Khorezm region to other regions and abroad.

Meanwhile, the Khorezm region has a highly developed transport infrastructure, which is represented by the railroad tracks (a total length of 128.7 km), roads (2265 km in length) and the international airport. Through the territory of the region is crossed lines between Uzbekistan, Kazakhstan, Russia, Turkmenistan and Iran. That is also an advantage and a stimulator of development of small business in terms of promotion of goods produced abroad.

Also, there is a decrease of small business activity in the provision of paid services, helped by the low level of consumer demand from households and businesses, the lack of development of market and communications infrastructure to provide services in rural areas (financial, transport and communications, trade and others.).

Along with traditional services, in recent years, the successful development of modern species as computer programming, communication and information, repair and maintenance of technological equipment, automobiles, agricultural machinery and others.

In this regard, to support entrepreneurial initiatives of young people must be the creation and implementation of an effective regional model of integrated and multi-level support of business.

Spatial entities SBPE not evenly placed (relatively fragmented). The main concentration and most rapid development of the scope of the subjects observed in the vicinity of the regional center, the transport infrastructure, in areas with a relatively high degree of security of electricity, and where there is the greatest concentration of large enterprises outstanding (Urgench city, Khiva, Urgench, Bogot, Khazorasp districts).

The most dynamic regions for development SBPE in terms of contribution of small business in the total volume of industrial production are Khiva - 73%, Urgench - 68%, Bogot - 52%, Khazorasp - 37% of the districts and the city of Urgench - 41% (the indicator above the regional value - 35%). Good results have been provided by the active participation of small businesses in engineering, light and food industries, as well as production of construction materials.

In general, the assessment of the business potential of the territories of Khorezm region allows you to group the regions:

Group I. The areas which has the highest values of the index in comparison with the regional index. In this group we include Gurlan, Urgench, Yangibazar district and the city of Urgench. Areas of this group and have skillfully used this spatial competitive advantage as a location along the well-developed transport infrastructure, which is the main driver of substantial SBPE dynamic development in their territories.

These the region are more specialized in labor-intensive types of production of goods of food and light industry, construction materials and engineering products that have production with high added value. It marked a significant activity and production entities SBPE in agriculture, construction, industry (except

Yangibazar), as well as retail trade and paid services (primarily in the city of Urgench, Urgench district) in comparison with other territories in the area.

It is noted insufficient involvement of entrepreneurs in the implementation of electrical generation projects, medical and pharmaceutical products, leather finishes and production of finished products based on it.

Group II. Areas characterized by an average level of the index, lagging slightly from the regional index. Among the areas of the group marked Bogot, Khonka, Shvot and Yangiaryq District. Businessmen of the group areas are based in the production of goods of food and light industries. Along with this, there is a low entrepreneurial activity in the realization of projects for the production of electrical goods, engineering products and medical and pharmaceutical industries.

Group III. Areas with low (Khiva, Khazorasps and Kushkupir areas) values of the index in comparison with the regional index. The main reason for the prevailing low levels is a high population living in the areas of these regions. Further development of industrial infrastructure, along with the development of the service sector contributed to the development of big business and the low level of cooperative ties with small businesses (mainly in the area of Khazorasp).

Meanwhile, in spite of the fact that these areas are in the same group, according to the business enterprise and local activity can be characterized in different ways. For example, in the area of Khiva and Khazorasp entrepreneurial activity can be estimated at the level of territories belonging to the first group. However, the presence of large populations and large enterprises, relatively reduce their per capita indicators. Moreover, their capital intensity did not give proper synergies to engage in this process SBPE potential. Although there is scope for this (set up a production base, high-quality labor potential of enterprise and initiative of the local population).

UDC: 330.338 (467).123.6

ROLE OF SERVICES FOR AUTOMOBILES IN DEVELOPMENT OF AUTOMOBILE BUSINESS IN KHOREZM REGION

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Abstract. In this paper the dynamics and imbalance distribution of subjects in repairing, maintenance of vehicles through the territories of the Khorezm region of Uzbekistan has been analyzed. On the bases of the research the proposals are developed for improving the activity of the enterprises for repairing and maintenance services in the automobile industry of Khorezm region.

Аннотация.Ушбу мақолада Ўзбекистон Республикаси Хоразм вилояти ҳудудларида автотранспорт воситаларини таъмирлаш ва уларга техник хизмат кўрсатиш бўйича субъектларнинг динамикаси ва номутаносиблиги таҳлил қилиб ўтилган. Тадқиқотлар асосида автотранспорт воситаларини таъмирлаш, техник хизмат кўрсатиш корхоналарининг фаолиятини такомиллаштириш бўйича таклифлар ишлаб чиқилган.

Аннотация: В данной статье проанализировано динамика и диспропорции распределения субъектов по ремонту, техническому обслуживанию автотранспортных средств по территориям Хорезмской области Республики Узбекистан. На основе исследований разработаны предложения по совершенствованию деятельности предприятий по ремонту и техническому и услуг в автомобильной промышленности Хорезмской области.

Key words: Automobile, transport sector, transport services, auto-tech services, car wash, vulcanization, oil change, car body repair, tire repair.

Калит сўзлар: автомобиль, транспорт сектори, транспорт хизматлари, автотехник хизматлар, автомобилларни ювиш, вулканизация, мой алмаштириш, автомобилларнинг кузовини таъмирлаш, шиналарни таъмирлаш.

Ключевые слова: автомобиль, транспортный сектор, транспортные услуги, автотехнические услуги, автомойка, вулканизация, замена масла, ремонт кузова автомобилей, ремонт шин.

Introduction:

The role of transport sector in Uzbekistan is increasing as it has sufficient role in the development of industry, agriculture, tourism and other sectors. Transport sector accounts for 9 percent of GDP and 4 percent of total employment in 2015 [2]. Today transport sector is becoming one of the key sector as it has a high multiplier effect for the economy.

In the last ten years, the transport sector has become one of the priority areas of investment; consequently, freight traffic volume has doubled. We want to mention that reaching to the given successes the role of automobile transport is comparable. Today the share of automobile transport in foreign trade freight transportations is around 10% as well as 88% in domestic passenger and freight transportations [4].

But despite these successes in the past three years' production in automobile industry decreased 2.8 five times, this situation is having an effect not only on increase in industrial sector but also seriously having an effect on increase of gross domestic product [1].

The President of Republic of Uzbekistan Sh.M. Mirziyoyev emphasized that "…needed principally new system for developing automobile sector, increasing competitiveness of its products, firstly, in neighboring and far away foreign countries markets" [1].

Therefore, we found that it is a good scope to do research on the topic of automobile business in Uzbekistan. However, we would like to dedicate this paper to the analysis of automobile business and other spheres effecting to the automobile business in Khorezm region.

Automobile market and auto-technic services in Khorezm region

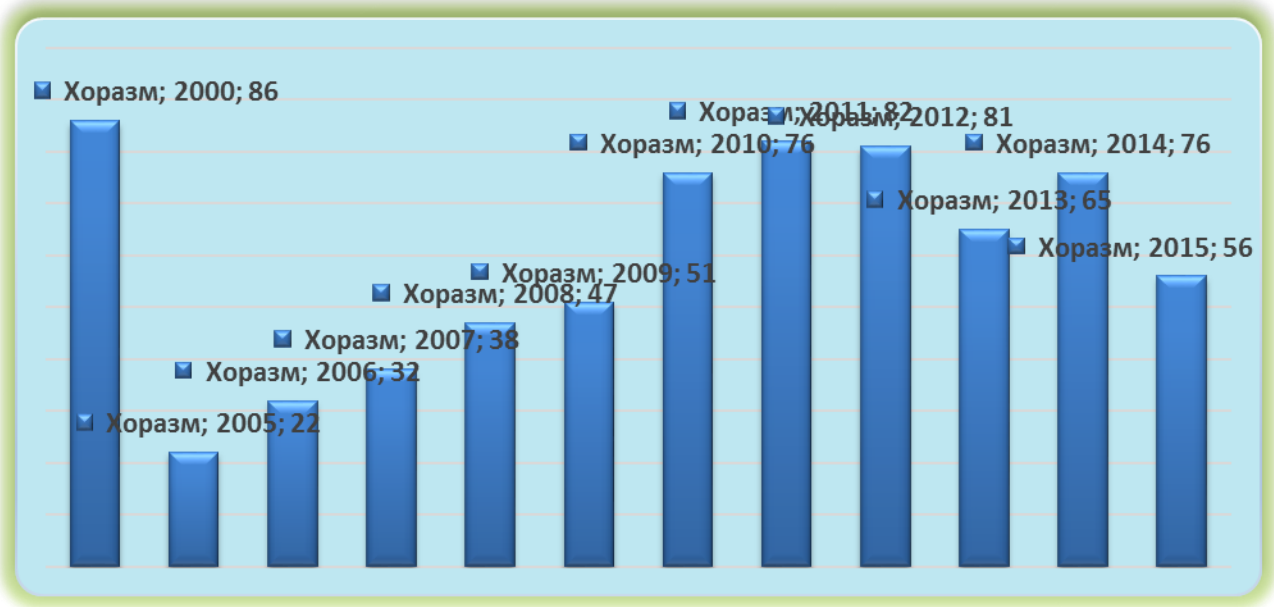
Khorezm is a region that has a sufficiently enough role in the automobile business of the Republic since, President of Uzbekistan signed a resolution "On

measures on organization of production of automobiles of Damas model in Khorezm region" on 21 February 2013. Consequently, in 2015 share of machinery and metallurgy became 31 percent of industrial output of the region, where it was just 4,5 percent in 2010.

In 2015 Khorezm branch of GM Uzbekistan JSC in Khazarasp district has manufactured 49 thousand "Damas", 2984 "Orlando" and 1431 "Labo" vehicles. Moreover, there is another company, UzXMG joint venture that specialized to produce agricultural machinery. This company manufactured 232 agricultural machineries, in particular 149 excavators, 72 bulldozers and 12 units of lifting equipment in 2015 [2].

There we would like to compare some indicators related with automobile business and services. First, we would like to mention that in 2000 in the region there was only one dealer and until 2015, it became three. However, it is just 5 percent of the dealers in Uzbekistan; therefore, we think that increasing number of dealers will support development of automobile business in the Region.

Automobile business is not just manufacturing or selling a car but it also covers automobile services and other technic services for automobile. Therefore, we will look through the dynamics of auto-technic services in Khorezm region (figure 1).



Source: [5]

Figure 1. Dynamics of auto-technic services in Khorezm region.

In 2000 there were 86 technic auto-technic servicing places in Khorezm, which decreased four times until 2005. From the figure 1 we can see that it increased until 2012 and became 82. Interestingly, in 2015 it decreased and became 56 that is 26.3 percent less than 2014.

As we can see, the number of auto-technic services (car wash, vulcanization, oil change, car body repair, tire repair and adjust tire pressure) are changeable as the most of them formed as an individual entrepreneurship or work as craftsman. Therefore, they do not need to be officially registered or if they are working as an

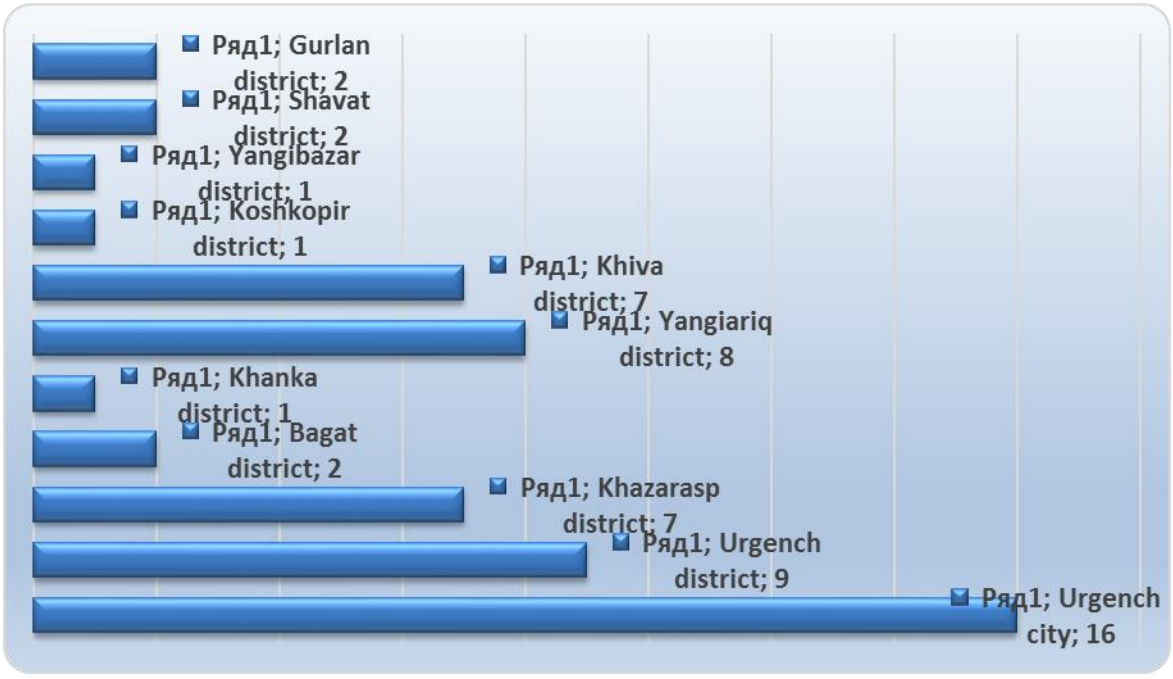
individual entrepreneurship they could stop their activities for a while and start it again, when they want. In Uzbekistan there were 1774 auto-technic services in 2015 while in Khorezm there were just 56 only 3 percent of it.

From the information given above, we conclude that for improving and developing automobile business and service, it is important to increase the number of auto-technic services.

For that, we have to help them to increase their business and open their own auto-technic servicing entrepreneurship. For solving this problem government is giving special credits with low interest rate and privilege period to the craftsman or population to start their own business.

In addition, there is another problem with this services is that, auto-technic services are not equally or normally distributed among the districts of the region. Statistic data shows that 25 of 56 auto-technic servicing subjects situated in Urgench city and district. But Khorezm region consists of ten districts. In some districts such as Khanka, Koshkopir and Yangiarik district there is just one auto-technic servicing place for whole district. In Shavat, Gurlan and Bagat district there are 2 auto-technic services. In Khazarsp and Khiva districts, there are 7 auto-technic services and in Yangiarik there are 8 auto-technic services (Figure 2).

As we mentioned above some people work as an craftsman and they are not registered, therefore, there are more auto-technic servicing places, but as they are small they do not have enough equipment or space. As well as more of them are specialized on just one of the following directions; car wash, vulcanization, oil change, car body repair, tire repair and adjust tire pressure. Our observations show that, because of the problems mentioned above the owners of the automobiles usually come across with the problem of the auto-technic servicing.



Source: [5]

Figure 2. Number of auto-technic services in Urgench city and districts of Khorezm region in 2015.

Sometimes in the districts it is difficult to find skilled and well-equipped auto-technic servicing places. So if drivers have serious problems they have to come to Urgench city that is 25 kilometers far from the nearest district. Sometimes they have to wait for a while in queue, as the number of good auto-technic servicing places are limited.

According to the results of our observation, drivers complain about the non-skilled and non-experienced masters. Often some masters cannot establish the real problem of the car, so drivers have to address several other masters for solving single problem.

Conclusion

Based on the results of the analysis and observation we conclude that auto-technic servicing is an important branch of automobile business. As it has direct connection with the usage of automobile. However, in Khorezm region the number of auto-technic services comes to three percent of the Republican indicator. They are not normally distributed among the districts. Sometimes drivers complain about the skills and experience of the master.

We thought that creating minimum one special universal auto-technic servicing center in all districts, that has all kind of technic services and offering there best experienced and skilled masters of the district will help to solve the problems and intensifies further development of the sphere.

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UDC: 616.711-007.271:616.8-07-08

REVEALING PSYCHOGENIC COMPONENT OF PAIN AMONG PATIENTS WITH SECONDARY COMPARATIVE STENOSIS SPINAL CANAL OF SPINE CERVICAL ANDLUMBAR PART

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Summary

IDENTIFYING PSYCHOGENIC COMPONENT OF PAIN WITH SPINAL STENOSIS CERVICAL AND LUMBAR SPINE

Adambaev Z. I. *, Kilichev I.A. **

We studied 110 patients with degenerative spinal canal stenosis (51 patients with cervical localization, 69 with lumbar). Psychogenic component of pain was identified in patients, which is manifested in the form of an imbalance of the autonomic nervous system, lungs depressive and cognitive changes are more pronounced in the cervical localization process.

Key words: spinal stenosis, a psychogenic component of pain, depression, autonomic imbalance.

Хулоса

УМУРТҚА ПОҒОНАСИ БЎЙИН ВА БЕЛ-ДУМҒАЗАҚИСМИ ОРҚА МИЯ КАНАЛИ СТЕНОЗИ БИЛАН БЕМОРЛАРДА ОҒРИКНИ ПСИХОГЕН КОМПОНЕНТИНИ АНИҚЛАШ

Адамбаев З.И.*, Қиличев И.А.**

Умуртқа поғонаси бўйин ва бел думғаза қисми орқа мия канали стенози билан 110 беморлар (51 нафари бўйин, ва 69 – бел думғаза қисми) текширилди. Текширилган беморларда оғриқнинг психоген компоненти аниқланди. Бунда беморларда вегетатив асаб тизими дисбаланси, енгил депрессия ва когнитив ўзгаришлар кузатилди. Бу ўзгаришлар бўйин қисми стенози бор беморларда кучлироқ ифодалангани аниқланди.

Калит сўзлар: орқа мия канали стенози, психоген оғриқ, депрессия, вегетатив дисбаланс.

Резюме

ВЫЯВЛЕНИЕ ПСИХОГЕННОГО КОМПОНЕНТА БОЛИ ПРИ СТЕНОЗЕ ПОЗВОНОЧНОГО КАНАЛА ШЕЙНОГО И ПОЯСНИЧНОГО ОТДЕЛОВ

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Исследовали 110 больных с дегенеративным относительным стенозом позвоночного канала (51 больной шейной локализацией, 69 – поясничной). У больных было выявлено психогенный компонент боли, проявляющийся в виде дисбаланса вегетативной нервной системы, легкими депрессивными и когнитивными изменениями, которые более выражены при шейной локализации процесса.

Ключевые слова: стеноз позвоночного канала, психогенный компонент боли, депрессия, вегетативный дисбаланс.

Spinal canal stenosis diagnosed, according to different authors, from 5-65,2% of patients with long-term degenerative processes in the lumbar spine [3]. According to many authors, the representation of depressive syndromes in patients with chronic pain is very variable and ranges from 10-100%. The prevalence of

depression in the population of patients with chronic low back pain ranges from 45 to 65%. Among chronic pain patients with cervical-thoracic depression is observed in 80%. In 10-15% of patients with acute back pain is transformed into a chronic under the influence of a complex of physiological, psychological and psychosocial factors. Depression is largely influenced by the characteristics of the pain, quality of life and prognosis of the disease [2,5,6].

Aim of the research: identification of a psychogenic component of pain among patients with spinal canal stenosis of the cervical and lumbar part.

Material and methods. We studied 110 patients with degenerative spinal canal stenosis relative aged 20 to 65 years, average age was 47,1 ± 1,1, men were 61 (55,4%), women – 49 men (44,6%). Among the 110 patients, 51 were patients who had stenosis of the cervical localization, and 69 –of the lumbar. All patients underwent clinical and neurological examination, CT scan or MRI. CT and MRI studies of our patients, we calculated the spinal canal area by the formula: $S = A \times B / 2$, where A – thesize of the front of the spinal canal; B – thesize of the sagittal spinal canal [7], which in all cases regardless of the type of spinal stenosis was from 100 mm^2 to 75 mm^2– arelative stenosis.

Research methods included: assessment of pain intensity on a visual analog scale (VAS); Psycho-emotional status was assessed using the following tests: the level of situational (SA) and personal anxiety (PA) was determined by the method Ch.D. Spilberg adapted by Yu.L. Hanin (1976). Rating: high level of anxiety – 46 points or above, medium – 34-44 points, low – 20-34 points. Beck Depression Inventory (BDI), adapted to the Research Institute of V. Behterev. Rating: BDI ≤50 points – the absence of depression; BDI = 51-59 points – mild depression situational or neurotic genesis; BDI = 60-69 points – subdepressive state or masked depression; BDI≥70 – true depression. Cognitive component of pain is determined by examining the cognitive evoked potentials (CEP) on the unit Neyronspektr-5 (Neurosoft, Russia) and study of the autonomic nervous system, identifying evoked skin vegetative potentials (ESVP) – on the machine VNS-Spectrum (Neurosoft, Russia). ESVP –it is a change of electrodermal activity in response to electrostimulation. ESVP is some to vegetative suprasegmental reflex, the effector organs which are the sweat glands, and "generator" response – the posterior hypothalamus. The prevalence of the sympathetic or parasympathetic influence leads to an increase or decrease in sweating. This is manifested in the rejection ESVP in a negative or positive way. ESVP calculates the following indicators: LP – latency ESVP; A1, A2, A3 – theamplitude of the first, second and third phases; S1, S2, S3 – theduration of the ascending part of the phase. For further analysis, we have to focus on A1p and A2p – the amplitude of the first and second phases, as A1P reflects parasympathetic response and A2p – sympathetic.

CVP explored, highlighting the complex P300 by meaningful auditory stimuli using 12 channels. To evaluate the motor P300 component was conducted keystrokes in recognizing meaningful auditory stimuli. For further analysis, taking average values of P300 latency potentials [1,4].

Results and discussion.

At the time of treatment, the pain intensity on the VAS of patients had a different intensity, and, in patients with lumbar spine pain intensity was higher (7,18 ± 0,09 points) than patients with cervical localizations (4,5 ± 0,05 points).

In the study of psychogenic component of pain, it was important to study the autonomic status of the patient. Among patients with spinal canal stenosis baseline autonomic balance revealed a predominance of sympathetic tone and the weakening of parasympathetic influences, and, among patients with cervical localization of this imbalance manifested more pronounced (ESVP A1P – 0,41 ± 0,01, ESVP A2p – 3,31 ± 0,08) than in patients with lumbar spine (ESVP A1P – 0,38 ± 0,01, ESVP A2p – 3,5 ± 0,08).

Evaluation of psychological parameters among patients with spinal canal stenosis analyzed in terms of reactive and personal anxiety that patients with cervical localization (RA – 51,53 ± 0,92, PA – 46,43 ± 0,62) was higher than in patients with lumbar localization (RA – 45,08 ± 0,52, PA – 42,05 ± 0,41). When the level on the scale of BDI in patients with spinal canal stenosis true depressive state has not been revealed. Some patients had no depression, part –identify and easy subdepressive state. Middle BDI with cervical localization was 56,01 ± 0,5 points, while the lumbar – 53,23 ± 0,8 points. If CVP study in patients with spinal canal stenosis found that patients noted an increase in the latency of P300, and in patients with cervical localization (320,51 ± 2,18) compared with lumbar (315,98 ± 2,85), these changes were P300 more pronounced. Thus, as a result of our research showed that in patients with degenerative relative stenosis of the spinal canal can be identified psychogenic component of pain, which is manifested in the form of an imbalance of the autonomic nervous system with a predominance of sympathetic tone, a moderate increase in reactive and personal anxiety, mild depression and cognitive changes in the form of slowing the speed of information processing, and these changes in patients with cervical localization compared to patients with lumbar spine are more pronounced, although the pain intensity VAS in patients with lumbar localization was higher than in the cervical localization. These results clarify the pathogenetic mechanisms of psychogenic component of pain in patients with degenerative spinal canal stenosis, in the genesis which play the role of not only peripheral but central mechanisms. This marked and long-lasting pain of peripheral origin leads to dysfunction of central nociceptive and antinociceptive systems, resulting in a slight depression and cognitive changes. It is known that depression forms in the patient's state of helplessness and total dependence on pain formed a kind of vicious circle between pain and depression, in which one condition aggravates the other [2]. In this regard, the therapeutic effects should be aimed at both the level of formation of pain - both peripheral and central mechanisms of pain, along with nonsteroidal anti-inflammatory drugs should be prescribed antidepressants.

Conclusions

1. Among patients with degenerative relative spinal canal stenosis can identify psychogenic component of pain, which is manifested in the form of an

imbalance of the autonomic nervous system with a predominance of sympathetic tone, a moderate increase in reactive and personal anxiety, mild depression and cognitive changes.

2. The psychogenic component of pain is more found among patients with cervical spinal canal stenosis localization as compared with the lumbar.

3. In the treatment of spinal canal stenosis it is necessary to consider the presence of psychogenic component of pain with the appointment of antidepressants.

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UDC: 613.2-058

THE RESULTS OF THE STUDY OF THE PHYSICAL DEVELOPMENT

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Annotation. Physical development of children who are at the age of school is considered to show index their organisms' health condition, outdoor environments effects' are good or bad. Observation on children shows that normal physical development on boys goes up at the same rate, but physical development's index on girls does not go up at the same rate.

Аннотация. Показателем определяющим состояние здоровье и негативное воздействие условий внешней среды на организм являются

показатели физического развития детей дошкольного возраста. У мальчиков количество детей со средним физическим развитием возрастает соответственно возрасту, а у девочек происходит неравномерно.

Аннотация. Мактабгача ёшдаги болаларнинг жисмоний ривожланиши кўрсаткичлари улараорганизмининг саломатлик ҳолатини, ташқи муҳит шароитининг ижобий ёки салбий таъсирини белгилайдиган кўрсаткич ҳисобланади.Кузатувдаги болаларда ўртача жисмоний ривожланишга эга бўлиш ўғил болаларда бир текисда юқорилашиб борса, қиз болаларда эса жисмоний ривожланиш кўрсаткичлари бир текисда кечмайди.

Key words: Physical development, health condition, growing up, morphologic condition, development.

Калит сўзлар: жисмоний ривожланиш, саломатлик ҳолати,сигмал оғиш,камол топиш, ўртача ривожланиш, морфологик белги, ўсиш, ривожланиш.

Ключевые слова: физическое развитие, состояние здоровье, сигмальное отклонение, морфологический признак, рост, развитие.

Physical development is considered an important indicator of health and living conditions, in relation to the upbringing of the younger generation, will serve as a method of objective control of the effectiveness of health interventions.

Physical development is the development of biological age determines the level of morphological development of the complex character of the body's natural biological laws and reflects the general laws of growth and development.

Physical development of children and teenagers is one of the data representing the status of the indicators of population health. In addition, the indicators of the physical development of children and adolescents in their quality of life, as well as the growth and development of external environmental conditions, positive or negative effects.

Research aims and objectives. The provision of kindergarten-age children attending preschool children and to assess the state of development of the physical and hygienic.

Research methods and facilities. Research facilities located in the city of Urgench kindergarten №1. Physical development generally accepted in the first half of the day in a manner determined by using anthropometric measuring instruments studied.

The results of the research. The information learned in preschool children's physical development is determined as follows. Sigma deviation limits of the low level of a certain amount of physical development of the 3-4-5 year-old children's encounters were identified (3.8; 2.9; 3.1); among boys, the figure is characterized as follows: 3-year-old children; 4-aged male, 2.7% and 4.9% of those age 5. 6 and 7-year-old boys and girls and the low level of physical development in a different form, was -2.9%.

Mid-low indicator of physical development were as follows: children between 3 and 4-year-old boys and girls, the indicator is expressed in higher -mos

13.3 and 10.0% of girls in the corresponding figures of 11.5 and 5.9 %; children 5-6 years old below-average physical development occurs more among girls: 15.5% 5-year-old, 6 years old, 14.4% and 9.7% of the age of 7; The boys 8.8; 8.6; 12.6%.

Average analysis of the physical development of the following numbers: 3 and 4-year-old girls among the children to be more physically apart. (Corresponding to the age of 73.1 and 78%), 69.9 and 71.8 percent of boys; 5 years, on the other hand, boys in physical development to higher numbers represent the average: 74.5% in 5 years, and 6 years of age and 75.2%, 7 years - 74.8%; girls, holds- 71.1%, 69%, 76.7%, the same figure a smooth high boys than girls' physical development is not smooth.

Mid-high number that represents the physical development of the following form: a girl between 3 and 4-year-old boys the same indicator showed a higher number of children - 14.2% and 15.5% females were 11.5% and 10.8%, respectively; 5th year of development, physical development of boys and girls, children with the highest average in almost the same way: 5 years - 11.8% and 12.4%, -13.3 and 13.5% at the age of 6, 7 years old - 8.7 10.7 (girls between the age of 7, this figure will rise to the border). Physical development indicators, which allows the analysis of the results.

Conclusions and recommendations. Sigmal deviation of the low level of development than other age limits 3-4-5-year-old girls is in high level. Physical development of children between 3 and 4-year-old boys and girls that the higher figures identified. Average physical development with a smooth high boys than girls' physical development is not smooth. The results of the observations to determine the causes of changes in anthropometric changes in the bodies of children (especially boys) will need to establish appropriate health measures.

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UDC: 612.921.39:613.7/9:612.014.46

HEALTH AND THE PSYCHOLOGY OF ACQUIRING UNHEALTHY HABITS

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Annotation. Acquiring unhealthy habits takes a special place among other negative factors such as smoking, drinking, drug addiction, hypodynamia, overeating that leads to the pathology of an organism. Acquiring of such habits is directly connected to different actions which happen under influence of human environment, family, different social institutions and human mental set.

Аннотация. Инсон организмига салбий таъсир қилиб, ҳар хил касалликларнинг келиб чиқишига сабаб бўладиган салбий омиллар ичида орттирилган зарарли одатлар, жумладан тамаки чекиш, спиртли ичимликларни истеъмол қилиш, гиёҳвандлик, камҳаракатлилик, овқатхўрлик ва бошқа қатор омилларнинг тутган ўрни катта. Айнан ана шу салбий одатларни ўзлаштириб олиш шахс томонидан атрофда кечаётган жараёнларга нисбатан бериладиган ижтимоий руҳий ҳолатларга, айниқса бу каби ҳолатларнинг ёшларда кечиши биринчи галда унинг оила аъзоларига, атроф-муҳитга ва бошқа ижтимоий институтларда олдиндан шаклланган ижтимоий меъёрларга яъни одатларга кўп жиҳатдан боғлиқ бўлади.

Аннотация. Среди отрицательных факторов, которые приводят к патологии организма занимает особое место приобретение вредных привычек как курение табака, употребление спиртных напитков, наркомания, гиподинамия, переедание и другие факторы. Приобретение данных вредных привычек на прямую связанны между процессом которые происходят под воздействием окружающей среды и в частности в семье и других социальных институтах и той социально-психологической установки личности.

Key words: Health, social, psychological, negative, factor, unhealthy, habit, disease, standard, set.

Калит сўзлар: Соғлиқ, ижтимоий, руҳий, одат, зарарли, касаллик, меъёр. омил, салбий, ҳолатлар.

Ключевые слова: Здоровье, социальный, психологичесий, отрицательный, фактор, вредные, привычки, заболевание, нормы, установка.

In many countries of the world, such as in our country acquiring different harmful habits among the youth is increasing, amongst them the rise of various diseases is considered as major problem not only in keeping health, but also the problem of a human being.

As the human is a conscious creature, he does not change and achieve unless he gives specific psychological condition to acquire social harmful habits. Simply, psychological state is the internal decision of a person. The decision not made by a person is not achieved through internal social sanction and external characters.

People sometimes acquire different kinds of harmful habits willingly or unwillingly, for example, smoking, consuming alcoholic drinks, drug addition, greediness, laziness in their lifetime. We have decided to mention about the process of acquiring bad habits like smoking among young generation which is growing rapidly. The person should have a motivation or stimulus to decide to smoke. It can only be social condition (which surrounds him), for instance, family, the place of study, labour community or something which surrounds him and the place where he works. People never simply be a smoker or drinker. A person has to acquire such kind of negative social habit with his activity. Simply, appropriate and natural question arises: When and where must we start to work in order not to acquire smoking, for example, a social negative habit. Today there is a scientific proved respond to this question. The work must be started while the baby is ìn the body of a mother. According to scientific reports, if anyone smokes beside a pregnant woman, nicotine will place in the brain of a baby after 30 minutes having been exhaled. So, if this chronic situation lasts 9 months, does the adaptation to the smoke of tobacco? Obviously, we may say the baby in the body of a mother is not a conscious creature. However, people are not accustomed to smoking consciously. Exactly unconsciousness, weak - will, carelessness may be cause of smoking.

What if the pregnant woman consumes tobacco? According to some literatures 60-75% of children who were brought up by the parents who smoke, have a tendency to smoke. We mentioned above for consuming alcohol and smoking cigarette by a conscious person social - psychological condition and stimulus are required. During the conducted research, we took various answers to the question" Why and where did you smoking?" 25% of smoking students do so by being interested in others,16,9% of them because of worries and 16,9% of them do not really know the exact cause of it (particularly it is the unawareness) 6,8% of them smoke to stand out among his peers,9,3% do so being encouraged by friends, 6% of them due to idleness,2,5 % of people when they are in the army,10% of them being just mischievous, 2,5% of them following their family members,2,5 % of them do in order to be attracted by girls, only 1,1% of them to lose weight or when they have a toothache and for some other reasons.

These mentioned negative conditions are primary symptoms of smoking but it's harmful effects are ahead. I have conversed with many smokers, however, none of them could say any good reason for smoking. Because there is no good reason for it. It is not worth saying the negative impact on the health of the smoker, economical harm and wasted time. For smoking a packet of cigarettes smoker spends at least 2 hours. It means, he smokes cigarettes nearly 25 days non-stop (If it takes 5 minutes every time he smokes). So the person who has been smoking for 35years will spend 2,5 years only with smoking. If a packet of cigarettes costs 3 or 5 thousand sums on average, a person smoked for 35 years will spend less than 50-55 million sums of money through smoke. Spend this money on meat or some other household products! You can feed the family for a long time. It is possible to provide the family with meat who consume 0,5 kilo of meat daily for 10 or 13 years. Moreover, it is possible to buy a car or 400-500 packs of flour.

Well, it can be said that why pupils need this all! However, we accomplish these process by visualizing through our consciousness and thoughts.

So, it is way practical to analyze all peculiarities, while assimilating any kind of unhealthy social habits into your daily norms. Imagine, a jobless breadwinner of the family smokes in that manner, would not the economic condition of family encounter impoverishment?

It is not normally demanded to have a high intellect to acquire those unhealthy habits. But in order to get rid of them person deeply needs an excessive courage, patience, stableness and tolerance. Naturally, an individual is required to possess a valuable quality, namely intellect to apply those peculiarities in reality. Let's look through the process of giving up smoking and its relevant psychological sides. There are various internal as well as external factors (motivations) that play a part in giving up smoking like in terms of taking up this habit. They may encompass parental advice, admonition, at times restrictions, doctors' recommendations, advice of sensible-minded people surrounding them, peers, a beloved wife and children. Similarly, laws banning this manner and most importantly, the diseases gained as a result of smoking. It does not matter how strong and influential abovementioned effects are, the smoker must provide himself with high social and spiritual condition. That is to say, he must make decisions for himself and carry out this with the help of inner social sanction power, or else his mind is obsessed with the opinion «Smoking cannot be given up" and consequently, he really fails to give up. Once in a while, smokers undergo heart attack, paralysis and some other ailments, after they recover from disease they smoke unconsciously one or two cigarettes a day due to lack of their firmness. Additionally, they may consume alcoholic drinks subconsciously which undoubtedly entails negative effects.

There is such a statement among Russians "Give up smoking prior to it leaves you or break it prior to it breaks you." Unfortunately, we occasionally comprehend this all later. At that moment, tobacco would have already broken or left us. All aforementioned events are the results of our positive or negative consciousness and spirit. Thus every parent, teacher, educator should endeavor to explain youth all elements of healthy lifestyle types. Firstly, they should explain them to analyze, after a fixed age, the core and causes of an activity before engaging in. In most cases, we can hear statements like « I did it unconsciously", " I did not understand".

Well, if you do not understand, have you not ever read the warnings on the cigarette packets about its harm?! Have you not ever seen the ones who ruined their life, family as well as children owing to alcoholism and drug addiction. If you ask some young people why they smoke or you advise like " Give up, that is not wholesome to your health", their response is certain " You do not understand it, it is improbable to give up." Every person is capable of getting rid of bad habits with strong determination. Any human leaves not only tobacco but also everything in this world. We have to work individually with this kind of young people acquiring unhealthy social habits. Every sensible-mined person, particularly adults should be

good psychologists and influence their children's minds positively no matter their occupations are. Otherwise, fighting by obligating them is the toughest way.

1. Detrimental habits impact a lot on the origin of socially vital ailments acquired by people amongst population.

2. In order to acquire these detrimental habits, it is demanded from an individual to provide himself with a social as well as spiritual condition.

3. Acquired detrimental habits among youth is due to their lack of knowledge on the consequences, medical-hygienic symptoms of those habits and not completely shaped morally healthy lifestyle.

4. People acquire those detrimental habits as a result of their weak minds and cannot give up due to same reason.

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UDC: 616.711-007.271:616.8-07-08

NEUROLOGIC MANIFESTATIONS AND CONSERVATIVE TREATMENT OF PATIENTS WITH DEGENERATIVE LUMBAR SPINAL STENOSIS

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SUMMARY

NEUROLOGICAL SYMPTOMS AND CONSERVATIVE TREATMENT OF PATIENTS WITH DEGENERATIVE SPINAL STENOSIS LUMBAR SPINE

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We offered complex therapy of diseases with degenerative spinal stenosis lumbar spine. Comparative estimation of the method is made between 70 patients (the main group) and group of the comparison - 40 patients, who got the traditional treatment. Comparative analysis revealed reliable efficiency of proposed method, as the most optimal. On background proposed therapy was noted reliable reducing of the pain and muscular – tonic syndromes, increase the volume of the motion in spine, reduction of neurogenic intermittent claudication.

Key words: spinal stenosis, conservative treatment.

ХУЛОСА

УМУРТҚА ПОҒОНАСИ БЕЛ-ДУМҒАЗА ҚИСМИ ДЕГЕНЕРАТИВ ОРҚАМИЯ КАНАЛИ СТЕНОЗИ БИЛАН БЕМОРЛАРНИНГ НЕВРОЛОГИК КЎРИНИШИ ВА КОНСЕРВАТИВ ДАВОЛАШ

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Умуртқа поғонаси бел думғаза қисми дегенератив касалликларида умуртқа поғонаси канали стенози бўлган беморларни комплекс даволаш таклиф килинган. Таклиф қилинаётган даволаш усули самарадорлиги таққослаш асосида ўрганилди. Бунда 70-та беморда асосий гуруҳ – таклиф қилинаётган усулида даволанган ва 40-та бемор таққослаш гуруҳи – анъанавий усулда даволанган. Таҳлиллар таклиф қилинаётган усулнинг ишонарли даражада самарали эканлигини кўрсатди. Таклиф қилинаётган даволаш усулида беморларни оғрик ва мушак-тоник синдромларининг ишонарли камайиши, умуртқа поғонаси ҳаракати кўламининг ошганлиги ва оёқларда кучсизликнинг камайиши кузатилди.

Калит сўзлар: орқа мия канли стенози, консерватив даволаш.

РЕЗЮМЕ

НЕВРОЛОГИЧЕСКИЕ ПРОЯВЛЕНИЯ И КОНСЕРВАТИВНОЕ ЛЕЧЕНИЕ БОЛЬНЫХ С ДЕГЕНЕРАТИВНЫМ СТЕНОЗОМ ПОЗВОНОЧНОГО КАНАЛА ПОЯСНИЧНОЙ ЛОКАЛИЗАЦИИ

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Предложена комплексная терапия больных с дегенеративным стенозом позвоночного канала поясничной локализации. Проведена сравнительная оценка метода у 70 больных (основная группа) и группу сравнения – 40 больных, получавших традиционную терапию. Сравнительный анализ выявил достоверную эффективность предлагаемого метода. На фоне предлагаемой терапии отмечалось достоверное уменьшение болевого и мышечно-тонического синдромов, увеличение объема движений в позвоночнике, уменьшение нейрогенной перемежающей хромоты.

Ключевые слова: стеноз позвоночного канала, консервативное лечение.

Lumbar spinal stenosis (LSS) diagnosed, according to different authors, from 5-65,2% of patients with long-term degenerative processes in the lumbar spine [6]. With the widespread introduction into clinical practice of the computer (KT) and magnetic resonance imaging (MRI) significantly increased the capacity of diagnosis of spinal stenosis [10]. However, the key issues of etiology, pathogenesis, clinical manifestations, and treatment strategy allows narrow channel remain largely unresolved, despite the long history of the study of pathology. Patients with a narrow spinal canal is traditionally carried out surgical treatment [2,13]. Some authors have noted the positive results of periradicular and epidural corticosteroids in 75% of patients with LSS [14,15].

The purpose of the study is to identify clinical and neurological symptoms in patients with degenerative lumbar spinal stenosis (DLSS) and to evaluate the effectiveness of the proposed conservative therapy.

Material and methods. We studied 110 patients with DLSS aged 20 to 65 years, average age was 44,1 ± 1,1 years, men were 61 people (55.4%), women - 49 men (44.6%). All patients underwent clinical and neurological examination, CT and MRI studies of our patients, we calculated the spinal canal area by the formula: S = A * B / 2, where A – the frontal size of the spinal canal; B – the sagittal size of spinal canal [11], which in all cases regardless of the type of spinal stenosis was from 75mm^2 to 100mm^2 – comparative stenosis.

We have proposed and carried out in the study group (70 patients), the complex of therapeutic measures – drug (non-steroidal anti-inflammatory drug,

muscle relaxants, dehydration therapy, vitamins, vasoactive drugs, anticonvulsants) in combination with physical therapy (with the inclusion of the spine traction, electrophoresis with drugs, heat treatments (DDT, paraffin), laser therapy, massage, chiropractic) in the strict implementation of the procedures carried out by the sequence. The control group (40 patients) received drug therapy, electrophoresis with anesthetics, massage and physiotherapy exercises.

Physiotherapy patients began to "dry" stretching on the horizontal mechanical traction table length from ten to forty minutes. On Course - 10 sessions. As a basis we adopted traction regimen in spinal osteochondrosis in muscularly relaxing (soft) mode by Drivotinovmethod [3]. During the traction treatment, except for the age and weight of the patient, further take into account the severity of the muscular corset, sex of the patient [4, 9, 12]. In carrying out the thrust loads traction women decreased to 5-10 kg, and the exposure, respectively, for 5-10 minutes.

Electrophoresis drug extract papaya tree papaya (Karipazim, Papain, Karipain PE 350) was carried out using the "Potok-1" apparatus (produced in Uzbekistan). Karipazim introduced by electrophoresis with the positive pole. Bottle karipazim 350 PE were diluted in 5-10 ml saline immediately before the procedure. The solution was added 2-3 drops Dimexidum. The solution was applied on filter paper placed on the electrode pads. Electrode dimensions – 10-15 cm. Temperature of layer – strictly 37-39ºS. Exposure time – 20 minutes. Courses of treatment – 10-12 procedures.

In the presence of contraindications to electrophoresis (cardiovascular failure, the presence of an artificial pacemaker, arrhythmia, cancer and skin diseases) used phonophoresis karipazim [1]. Karipazim 350 PE mixed with 2 ml indomethacin ointment was applied to the affected symmetric region along the spine portion. The exposition of 10 minutes. In the course of 10-12 procedures.

After electrophoresis is performed DDT or paraffin, which also improves the microcirculation in the affected area and thus potentiates the action of enzyme preparations, and indirectly enhances the reparative processes in the spinal motion segment, as well as relaxes the muscles [1].

Low-intensity laser radiation acts on almost all links of the pathogenesis of degenerative spine disease, providing anti-inflammatory, analgesic, decongestant, an immunomodulating effect [7]. Particularly good effect of treatment is observed in conjunction with exposure to laser constant magnetic field, because the two physical factors are synergistic [7]. Laseromagnetotherapy held device "Vityaz" long laser wavelength of 0.89 microns (infrared radiation). The impact exerted on the area of greatest pain on palpation and movement of the vertebrae on either side of the spinous processes, the segment above and below the most painful. If necessary irradiated point along the diseased segment. Total 7-8 impacts, for 1 minute to the area, no more than 10 minutes. Immediately after laseromagnetotherapy almost without interruption, patients received a classic back massage and associated limb for relaxing the procedure followed by manual therapy, which eliminates the functional blocks in the vertebral-motor segment

(removes muscle défense and aligns muscle imbalance) [11]. All procedures were performed daily, in the above defined sequences rate was 10 to 12 treatments.

The efficacy of the treatment was evaluated on the following criteria: 1) the intensity of pain on a visual analog scale (VAS – 10 points); 2) muscle-tonic manifestations; 3) the amount of motion in the spine; 4) the distance before the emergence of neurogenic intermittent claudication. The degree of the musculo-tonic syndrome (MTS) was determined by calculating the index of muscle syndrome (IMC):

1) spontaneous pain evidence: 1 point – no pain at rest, appear under load; 2 points – insignificant pain at rest, aggravated by movement; 3 points – pain at rest, disturbed sleep, forced to pose;

2) muscle tone: 1 point – finger easily immersed into the muscle; 2 points – for immersion requires a certain force; 3 points – muscle density stone;

3) muscle soreness: 1 point – palpation patient indicates the presence of pain; 2 points – response to palpation of the facial reaction; 3 points – answer general motor reaction;

4) duration of pain: 1 point – soreness cease immediately; 2 points - continued to 1 minute; 3 points – lasts more than 1 minute;

5) the degree of irradiation of pain on palpation: 1 point – pain is localized at the site of palpation; 2 points – the pain spreads to the tissue located near; 3 points – pain spreading to remote areas.

IMC is assessed by the total score of these signs: I degree (mild) – IMC to 5 points; II (average, reasonable) – from 5 to 12 points; III (hard, severe) – more than 12 points [12].

Range of motion in the affected segment was assessed by patient – 4 scale (0 – the amount of movement is not limited to, 1 point – a slight limitation, 2 points – moderate limited 3 points – severely restricted). [3].

Distance to the occurrence of neurogenic intermittent claudication determined by the patients complains.

Results. All patients on CT and MRI was detecting DLSS. The causes of stenosis in our patients was spondyloarthrosis in 93 (84.5%), of whom 18 (16.4%) had a combination spondyloarthrosis with hernias of intervertebral discs of various localization. In 17 (15.5%) – was the cause of stenosis spondylolisthesis I and II degree, of whom 12 (10.9%) persons it was combined with a medial hernia. The amount of disc prolapses by CT and MRI ranged from 5.5 mm to 10 mm. Clinical and neurological picture of the disease was presented in the form of radiculopathy (81 patients, 73.6%), radikuloishemie (25 - 22.7%), myelopathy (at 4-3.6%). Sensory disturbances in the lower extremities were detected in 75 (68.2%) patients, 5 (4.5%) –in the anogenital area. Violations of pelvic organs by delay type diagnosed in 5 (4.5%) patients. Periodic cramp in the calf muscles in 15 (13.6%), neurogenic intermittent claudication – in 95 (86.4%). Radicular pain syndrome manifested by 2 to 7.5 points on the VAS. Pain in the lumbar region, often two-way, extends to the buttocks, thighs and then the feet. In other cases, on the contrary, appear in the feet and legs and lifted to the hips and lower back. The

syndrome of intermittent claudication patients describes as pain in the legs accession fatigue, weakness, pain and numbness in the legs and feet. In some cases, they describe their feelings on the part of the lower limbs as burning, convulsive grip, tingling, "wicking" vague fatigue, stiffness in the hips and legs. Pain disappears or decreases in a sitting position, when bent or crouching position to a greater extent than the distance at the termination. In patients with moderate radikulomieloishemie observed and expressed motor disorders. It noted the relationship of neurological symptoms (muscle weakness, loss or reduction of reflexes, sensory disorders) with a load. Symptom Lasegue (or test right outstretched leg) increasingly negative. In contrast, discogenic pain, bending or verticalization does not increase symptoms. To measure our pain intensity visual analogue scale (VAS) was used. In the primary treatment of pain intensity on the VAS was similar in the groups: 7,4 ± 0,3 points in the control group and 7,5 ± 0,2 - in the primary. During treatment, pain intensity decreased in both groups. However, in patients with a core group of pain intensity on the VAS was significantly ($P < 0.05$) lower than 2,0 ± 0,1 points, than in the control group - 2,7 ± 0,3 points (see Table.). Muscul-tonic manifestations in the surveyed groups corresponded to the degree of pain severity was comparable: at 12,5 ± 0,2 points in both groups. After 10 days of IMC in both surveyed groups declined: in the control – up to 4,8 ± 0,2 points, and in the main - to 2,0 ± 0,2 ($P > 0.05$). The positive dynamics of pain and accompanied by a significant decrease in IMC pain paravertebral points in the projection of the L3-S1 segments (see Table.). In assessing the effectiveness of the treatment of the restoration of the affected organ function is no less important than the disappearance of pain. Restoring the spine function characterized by an increase range of motion in the affected PDS. During the initial examination, the majority of patients in both groups observed a sharp limitation of movement in the affected PDS: in the main group – 2,5 ± 0,2 points, the control – 2,5 ± 0,3 points. Recovery of motion in the course of treatment were observed in both groups, however, in the exhaust gas (1,0 ± 0,1 points) these data were significantly better than in the CG (1,5 ± 0,2 score) (Table.). Neurogenic intermittent claudication is the primary symptom of the LSS, was observed in patients in the MG and CG before treatment and data were comparable. The improvement of the patients in the form of increasing distance until neurogenic intermittent claudication was observed after treatment in both groups, however, the data in the exhaust gas were significantly better than in the CG (Table.1).

Discussion. As shown by the comparative analysis of the dynamics of clinical manifestations in patients with MG and CG significantly better results ($P < 0.05$) were observed in patients treated with the proposed method of treatment. This can be attributed to the correct sequence of applied physiotherapy factors. Using them in the proposed sequence, we have achieved the best results. In our opinion, held in the beginning of treatment Traction effect on vertebral-motor segment leads to a slight retraction of herniation (due to the "vacuum effect"), a decrease in compression of the spinal root, as well as a decrease in compression sciatica-medullary vessels. This in turn leads to a reduction in edema and restoring

the microcirculation in the affected area. Recovery microcirculation increased bioavailability of drugs delivered physiotherapeutic methods (electrophoresis with enzyme preparations), and administered enterally. After that DDT is performed or paraffin, which also improves the microcirculation in the affected area and thus potentiates the action of enzyme preparations, and indirectly enhances the reparative processes in the spinal motion segment. Assign, subsequently, has also laseromagnetotherapy vasoactive, immunomodulatory, analgesic and reparative action. At the end of the treatment session conducted by manual therapy and massage, which cascade increases blood circulation, eliminates the function blocks in the vertebral-motor segment (removes muscle défense and aligns muscle imbalance). This "cascade" effect on the vertebral motor segments, when each subsequent physiotherapy factor enhances the effect of the previous one, allows to achieve the maximum therapeutic effect.

Conclusion. In patients with degenerative lumbar spinal canal stenosis localization of clinical and neurological picture characterized by radiculopathy (81 patients, 73.6%), radikuloishemiey (25 - 22.7%), myelopathy (at 4 - 3.6%), intermittent claudication in 95 (86.4%) patients and in 5 epikonus syndrome (4.5%) patients in the form of perineal pain and dysfunction of pelvic organs. Our proposed package of medical measures – drug (non-steroidal anti-inflammatory drug, muscle relaxants, dehydration therapy, vitamins, vasoactive drugs, anticonvulsants) in combination with physical therapy (with the inclusion of traction of the spine, electrophoresis of drugs, thermal procedures (DDT, paraffin), laser therapy, massage, manual therapy) in a strict sequence of procedures carried out by performing an effective, pathogenetically justified complex conservative treatment of these patients.

Table.1

Some clinical information on examined patients during treatment

Indicators	**Main group**		**Control group**	
	Before treatment	After treatment	Before treatment	After treatment
Intensity of pain in movements	7,5±0,2	2,0 ± 0,1#*	7,4 ± 0,3	2,7 ± 0,3
Capasity of movement in affected PDS	2,5 ± 0,2	1,0±0,1 #*	2,5 ± 0,3	1,5±0,2
IMC	12,5 ±0,2	2,0±0,2 #*	12,5±0,2	4,8±0,2
neurogenic intermittent claudication	545,29± 60,71	863,0± 62,24#α	588,16± 82,52	722,06± 81,74

Note: # reliability > 0,001 between 2 groups before and after treatment.
* reliability > 0,05 between main and control groups after treatment.
α - reliability> 0,001 between main and control groups after treatment.

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UDC:616.1.:616-071.6.616-079.5.

CLINICAL AND DIAGNOSTIC ASPECTS OF ARTERIAL HYPERTENSION IN YOUNG ADULTS

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Abstract. The aim of our research is based on the study of clinical and functional features of arterial hypertension to identify the most informative diagnostic criteria for initial stage of hypertension in young adults. During the diagnosis of arterial hypertension in young adults, a comprehensive assessment of all parameters of circadian blood pressure profile is required.

Anotatsiya. Ushbu izlanishning maqsadi: arterial gipertoniya klinik va funktsional xususiyatlarini o'rganish asosida yosh bemorlarda gipertoniya boshlang'ich bosqichi uchun eng axborotli diagnostic mezonlarini aniqlash. Yosh bemorlarda gipertoniya tashxisi koyishda barcha ko'rsatkichlarni har tomonlama baholash talab etadi.

Аннотация. Целью нашего исследования явилось: на основе изучения клинико-функциональных особенностей течения артериальной гипертензии, морфофункционального состояния сердечно-сосудистой системы выявить наиболее информативные диагностические критерии начальной стадии артериальной гипертензии у лиц молодого возраста.

Key words*:* arterial hypertension, clinic, diagnostic.

Kalit s o'zlar: arterial gipertoniya, klinika, diagnostika.

Ключевые слова: артериальная гипертензия, анамнез, клиника, диагностика.

The age of the first displays of a disease, being considered earlier peculiar only as the adult, has considerably gone down, and AG is registered in earlier age groups [3,7]. AG is not only one of the most widespread, but also one of the least diagnosed diseases. The feature complicating diagnostics of AG at early stages at young people is the transitory nature of increase in the arterial pressure (AP) [6] The practical doctor not always manages to register BP at the moments of its increase at young people with passing and short-term rises BP. Meanwhile it is known that rare episodes of increase can lead BP to sudden cardiovascular complications [3,5]. Other important feature of the initial stages of AG is the long asymptomatic period in this connection; young people do not know long time about availability of a disease, seldom see a doctor and are not inclined to

independent control BP, even during the feeling sick periods. However, when low readiness of patients for inspection and accomplishment of medical recommendations are observed, diagnostics and treatment of essentially AG are especially effective [1,2,4].

Not specificity of clinical implications of AG at young people and lack of the adequate algorithms of diagnostics focused on this age complicate medical assessment of symptoms of a disease. The role of probabilistic methods of assessment of clinical data repeatedly increases in these conditions.

Research objective: on the basis of studying of clinic-functional features of a course of arterial hypertension, a morphofunctional condition of cardiovascular system to tap the most informative diagnostic criteria of an initial stage of arterial hypertension at persons of young age.

Materials and methods of a research.

Researches were conducted on without changes out-patient departments No. 2 of Urgench and Rural medical point "Goybu" Urgench region. RMP "Goybu" being sample rural medical point, serves 16 548 people of the population from whom 8263 - men (49,9%), 8285 – women (50,0%), teenagers – 740 (4,47%), children up to 14 years – 4420 (26,7%).

The "case control" research which included 114 patients with transitional rising of the ABP to the I degree at dynamic observation and lack of the lesions of target organs taped at standard clinical inspections (group 1) is executed; 53 patients with AG with stable rising of the ABP of the I-II degree and existence of lesions of the target organs (group 2) and 32 young men which do not have at dynamic observation of rising of the ABP (control group). Groups were comparable on gender and age.

Criteria of including: men and women aged from 18 up to 27 years; patients with the increased level of ABP of I-II degrees; the informed consent of the patient to participate in a research.

Criteria of an exception: symptomatic arterial hypertension; pregnancy; use of the hormonal contraceptives, non-steroidal anti-inflammatory drugs and other curing agents promoting rising of the ABP; an exacerbation of chronic or emergence of acute inflammatory diseases in the course of the research; unwillingness of the patient to participate in a research.

Comprehensive clinical examination included the collecting of complaints, the anamnesis, assessment of risk factors of AG, determination of weight, body height, a waist circle. The diagnosis of AG was established according to references of the All-Russian Scientific Organization of Cardiologists (ARSOC) (2003, 2007) — at the level of the systolic arterial pressure (SAP) $\geq$ 140 m hg and/or the diastolic arterial pressure (DAP) $\geq$ 90 mm of mercury. [7]. The exception of the AG symptomatic forms was carried out according to references of Committee of experts ofWorld Science Society of Cardiologist [7].

Daily monitoring of the ABP (DMABP) was carried out on an outpatient basis in a regimen of "the typical working day" by means of the Bplab monitor (LLC Pyotr Telegin, Nizhny Novgorod) by a standard technique. An

echocardiography (ECG) was carried out from the standard positions in situation on the device "Ultramark-9 HDI ATL" (USA). In a research one-dimensional and two dimensional methods of ECG.Vo, all procedures of the statistical analysis were applied the critical significance value p was accepted per 0,05.

Results and discussion.

Diagnostics of AG in the 2nd group came easy. Average values daily /DABD made respectively 148,61 ± 6,79/96,32 ± 5,33 mm of mercury. At patients of this group stable rising of the ABP level was observed: in 42,3% of cases — constantly within a day, in 27,5% — with its daily rises on 3–5 hours from one to several times a day, and in 30,2% of cases — about one days and more. Therefore, it was not difficult to confirm rising of the ABP at repeated measurements: on average in 9 of 10 measurements the ABP ≥ 140/90 mm of mercury was administered. At 58,5% of patients the level of the day ABP corresponded to degree AG II. Feature of group was quite high frequency of structural changes of a myocardium of the left ventricle (LV): in 34,0% of cases the concentric hypertrophy ofLV is taped. Thus, stable rising of the ABP, existence of lesions of target organs indicated that at patients of this group the initial stage of a course of a disease was passed.

Diagnostics of AG at patients of the 1st group, on the contrary, represented extremely complex challenge. So, average values clinical systolicblood pressure and diastolic blood pressure were in range below 140/90 mm of mercury. (137,64 ± 6,68/88,78 ± 4,70 mm of mercury.). However, in the anamnesis at all patient's episodes of rising of the ABP to degree level II became perceptible: in 38,5% of cases with a frequency up to 1-2 times a week, in 31,6% — to 1–2 times a month and in 29,9% — 1 time in 2–6 months. And most of young people's (56,1%) ABP raised quickly, in a span of one or two hours, in 36,0% of cases — in a span of 2-6 hours, and only in 7,9% of cases- during about one day.

As results of clinical measurements of the raised ABP, this group of patients differed in low reproducibility, for confirmation of rising of the ABP ≥ 140/90 mm of mercury. repeated day measurements with long (more than two weeks) an interval were required. As a result, only in 4 office measurements from 10 at representatives of group 1 rising of the ABP level was registered. At the same time in spite of the fact that in 6 cases from the 10th the ABP level at them was in range from optimum to high normal, average values office the SABD and DABD were significantly above, then at healthy peers of control group (116,55 ± 5,94/73,92 ± 5,62 mm of mercury.; p<0,0001).

<! -- 0-->Thus, well-timed diagnostics of AG at patients of this group became possible only thanks to repeated day measurements of the ABP and quite long period of observation. While the standard approach which is limited to triple measurements of the ABP with an interval between measurements not less than a week did not provide sufficient reproducibility of results of clinical measurements of the ABP at young patients with unstable rising of the ABP level. It is obvious for this reason patients of this category most often are left without observation, and the disease at them is taped already at a stage of a lesion of target organs.

In group 1 episodes of rising of the ABP were registered within the last 3 years, and in the 2nd group -7 years (p = 0,041).

Assessment of subjective symptomatology testified to absence of any complaints at the considerable part of patients of the 1st and 2nd groups (33,9% and 31,7% respectively). If complaints took place, it came down to a headache of different localization (44,4% and 47,2%; p = 0,47), to dizziness (9,1% and 10,5%; p = 0,06), to tachycardia (6,3% and 5,7%; p = 0,89), to discomfortable feelings in heart (4,3% and 2,5%; p = 0,054). In 2,0% and 2,4% of cases only the general complaints-weakness, fatigue, gravity in all body were marked.

The emotional pressure (specific weight in structure of the reasons - 58,6% and 56,1%), intensive or moderate physical activity (4,6% and 5,1%), a weather changing (3,8% and 2,2%), mental tension (3,1% and 2,0%) was called the most frequent reason of complaints.

Thus, owing to not specificity of subjective symptomatology, low knowledge of the factors promoting development of AG, young patients with AG are not inclined to measure level ABP during the periods of deterioration in health that complicates early diagnosis of a disease at persons of a young age.

The analysis of the risk factors (RF) showed statistically absence of significant distinctions between representatives of the 1st, 2nd and control groups on prevalence of smoking, low physical activity, the excess use of table salt, frequent alcohol intake. The heredity burdened on early cardiovascular diseases in groups 1 and 2 met equally often (79,5%). Data received testified to low informativeness of risk factors for early diagnostics of AG at persons of a young age.

At the same time in the analysis of the reasons existence of significant connection of FR with increase stabilizing ABP is set. So, such factors as smoking (p<0,0001), including passive (0,0001), AG at mother exerted impact to AG on formation of labile AG, at the father, alcohol intake frequency more than 1 time a week, a male (p = 0,003), increase ABP at mother during pregnancy (p = 0,008).

Exerted impact on formation of stable AG: liberation from physical culture in educational institution, excess body weight (p< 0, 0001), smoking, an obesity at mother, existence of strokes in the area of mother (p = 0,042), existence of strokes in the area of the father (p = 0,023), a pyelonephritis at mother during pregnancy (p = 0,028), low body weight at the birth (p = 0,052).

It was succeeded to confirm the existence of AG in day of monitoring at patients of the 1st group in 78, 1% of cases. Moreover, the average SABP and DABP values within a day, during the periods of wakefulness and a dream did not exceed critical norms values. Thus, for early diagnostics of AG young patients in the conditions of infrequent episodes of rising of the ABP of assessment only of one average value of the main indicators of DMAD have not enough. In this regard we carried out the complex analysis of all components of the ABP daily profile.

With transitional rising of the ABP the average SABP and DABP values in day of monitoring can remain unchanged with persons. Therefore, at diagnosis of AG complex assessment of all parameters of the ABP daily profile is required that will allow doctors of primary link, specialized units of hospitals to open a short of the

available divergences of the conclusions ofDMAD and results of clinical measurements of the ABP at young people with infrequent episodes of rising of the ABP and to define tactics of maintaining young patients.

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CORRELATION ANALYSIS AND ITS RELATION WITH DISORDERS INTESTINAL MICROFLORA IN CHILDREN WITH DIARRHEA LIVING IN THE SOUTH ARAL REGION

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Annotation. The article noted that microbiocenosis in children living in the Southern Aral Sea region has a correlation between indigenous and facultative organisms, at diarrheal diseases “physiological” decline and “pathological” correlation increased.

Аннотация. Мақолада Жанубий Орол бўйида яшовчи болалар микробиоценозида индинген ва факультатив микроорганизмлар орасида корреляцион боғликлик бўлиб, диареяли касалликларда “физиологик” боғланишлар камайиб “патологик” богланишлар сони ортиши кузатилгани баён қилинган.

Аннотация. В статье отмечено, что в микробиоценозе у детей проживающих в Южном Приаралье имеется корреляционная связь между индигенной и факультативной микроорганизмами, а при диайрейных заболеваниях уменьшаются “физиологические”, увеличиваются “патологические” корреляционные связи.

Keywords: diarrhea, microbiocenosis, correlation analysis, positive relationship, negative relationship, pathological correlation relationship, colon, indigenous,microflora, facultative microflora.

Калит сўзлар: диарея, микробиоценоз, корреляционтахлил, ижобийбогланиш, салбийбогланиш, патологиккорреляционбогланищ, йўгоничак, индигенмикрофлора, факультативмикрофлора.

Ключевые слова: диарея, микробиоценоз, корреляционный анализ, положительная связь, отрицательная связь, патологически-корреляционная связь, толстый кишечник, индигенная микрофлора, факультативная микрофлора.

The notion that between the various signs of living beings there is some relationship, originated in ancient times (Hippocrates 460-377. BC). However, the first major compilation in this area belongs to Zh.Kove, who in 1806 first proposed the term "correlation", and in 1815 put forward the principle of two-coordination and correlation.

For a complete understanding of the correlation structure of the body it is necessary to study how the coefficients of the linear (X), and non-linear (n-correlation ratio) correlation. As a rule, the functioning of biological systems is characterized by non-linear nature of the correlations. Although these properties can not be interpreted as having a causal relationship between the studied traits, however, it reflects the nature of the statistical relationship (1,3).

We examined the relationship between indicators of the main representatives of the normal microflora of the large intestine using correlation analysis. Correlation analysis of the basic parameters of the intestine microbiocenosis held us with Spearman rank correlation coefficient of determination in healthy children and patients with dysentery, salmonellosis, colienteritis and diarrhea and other unknown bacterial etiology. When determining the end, we used the correlation coefficient at a value of> 0.5. It was found that in healthy children the total number of related options was 8 of 21 (38%), the most significant positive relation between marked: bifidobacteria /lactobacilli, bifidobacteria / lactose "+" E. coli, lactobacilli "+" E. coli; Staphylococcus / enterococcus (2,4).

Patients dysentery marked preservation of a large number of positive and negative connections, occurring in healthy, but at the same time, new

communication: bifidobacteria /Candida; Bifidobacteria /lactose "-" E. coli; Lactobacillus /Candida; Lactobacillus /lactose "-" E. coli; Streptococcus / Candida; Streptococcus / lactose "-" and others. The total number of connections as compared with healthy and increases of 91% (19 of 21). Also, attention is drawn to a large number of positive and negative contacts of patients with salmonellosis 16 of 21 (76%). Some appeared due disappeared compared to patients with dysentery bifidobacteria / streptococci; Lactobacillus /Streptococcus; Candida / lactose "+" E. coli, as well as there is a weakening of some connections compared with those with dysentery. (Table 1.)..

The smallest number of links indicated in patients colienteritis 38% (8 of 21). There are new communications bacteria /Candida; Staphylococcus /Candida; and disappear, such as the connection latobatsilly / lactose "-" E. coli; staphylococcus /streptococcus lactose and "+" E. coli / lactose "-" E. coli compared to healthy people.

Patients children diarrheas unknown etiology number of connections is significantly higher than in healthy children, 62% (13 of 21). Attention is drawn to the emergence of new relations bifidobacteria / staphylococcus; Lactobacillus / staphylococcus, which were absent in healthy children and in patients with dysentery, salmonellosis and colienteritis. In addition, new communications bifidobacteria /Candida; Staphylococcus /Candida; Staphylococcus / lactose "+" E. coli: streptococci / of Candida and of Candida / lactose "-" E.colis disappearance of lactobacilli relations / lactose "-" of E.coli: Staphylococcus / Streptococcus as compared with healthy children. Analysis of related variants of the intestinal microflora in patients with children with diarrheal diseases other bacterial etiology indicates that the figures obtained were not significantly different from those patients kolienteritami children apparently microorganisms belonging to the same family have the same effect on the intestinal microflora.

Table 1.

Correlation analysis between the basic parameters of the intestine microbiocenosis patients with diarrheal diseases of children

№	Groups	Bifid. Lact.	Bifid. Staph.	Bifid. Strep	Bifid. Candida	Bifid E.coli lac.+	Bifid E.coli lac. -	Lac Staph.	Lact. Strep.	Lact. Candida	Lact E.coli lac+	Lact. E.coli lac-
1	General groups	0,8	-0,2	-0,4	-0,9	0,7	-0,8	-0,3	-0,4	-0,8	0,7	-0,7
2	Dysentery	0,9	-0,3	-0,5	-0,9	0,9	-0,9	-0,3	-0,5	-0,9	0,9	-0,9
3	Salmonellosis	0,8	-0,2	-0,4	-0,7	0,8	-0,8	-0,2	-0,3	-0,7	0,8	-0,7
4	Colienteritis	0,7	-0,2	-0,2	-0,7	0,5	-0,5	-0,3	-0,2	-0,7	0,5	-0,3
5	Undetermined etiology	0,7	-0,8	-0,4	-0,7	0,5	-0,5	-0,4	-0,4	-0,7	0,7	-0,4
6	Other bact. Etiologies	0,7	-0,3	-0,4	-0,8	0,5	-0,5	-0,1	-0,3	-0,7	0,6	-0,4
7	Health II-control group.	0,8	-0,3	-0,2	-0,1	0,8	-0,7	-0,4	-0,2	-0,7	0,7	-0,6

Continuation of the table

№	Groups	Staph Strept	Staph Cand.	Staph. E. coli. lac+	Staph. E. coli lac-	Strep.Cand	StrepE. colilac +	StrepE. coli lac -	Cand E. coli lac. +	Cand E. coli lac. -	E.coliлак + E.colilac. -	P>0,5
1	General groups	0,7	0,8	-0,7	0,6	0,8	-0,6	0,7	-0,5	0,7	-0,8	17/21-81%
2	Dysentery	0,7	0,8	-0,8	0,7	0,9	-0,7	0,9	-0,6	0,9	-0,9	19/21-91%
3	Salmonellosis	0,5	0,7	-0,7	0,6	0,7	-0,5	0,8	-0,4	0,8	-0,9	16/21-76%
4	Colienteritis	0,4	0,6	-0,4	0,3	0,5	-0,3	0,2	-0,2	-0,4	-0,4	8/21-38%
5	Undetermined etiology	0,4	0,6	-0,6	0,4	0,6	-0,4	0,3	-0,3	0,6	-0,7	13/21-62%
6	Other bact.etiologies	0,6	0,6	-0,3	0,2	0,5	-0,2	0,4	-0,3	0,4	0,3	9/21-43%
7	Health II - control group	0,9	0,4	-0,2	0,4	0,3	-0,3	0,4	0,2	0,3	-0,9	8/21-38%

Noteworthy is the fact that between bifidobacteria and lactose "+" E. coli has a moderate and strong positive, between bifidobacteria and lactose"-"the average E. coli and a strong negative correlation in both healthy and all patient’s diarrheal diseases children.

In healthy children in a quiet functioning bowel microbiocenosis number of statistically significant relationships is low 8 of 21 (38%) to the "pathological" correlations that appear during diarrheal diseases in children (dysentery, salmonellosis, colienteritis and diarrheal diseases and other unknown bacterial etiology) in children the Southern Aral Sea region.

are bifidobacteria /staphylococci; Bifidobacteria /Candida; Lactobacillus /staphylococcus; Lactobacillus /Streptococcus; Streptococcus /Candida; Staphylococcus / lactose "+" E. coli; Streptococcus / Candida; Streptococcus / lactose "+" E. coli; Streptococcus / lactose «-» E. coli; Candida / lactose "+" E. coli and Candida / lactose "-" E. coli. The greatest number of related variants have been reported in children dysentery, salmonellosis, diarrhea of unknown etiology, which indicates the severity of a pathological process in diseases of the data (5).

Thus, in patients with diarrheal diseases of children, dysentery, salmonellosis, kolienterit, diarrheal diseases and other bacterial, of unknown etiology in the Southern Aral Sea region is detected an increase in the number of inter-related indicators microbiocenosis colon with the advent of so-called "pathological" correlations. This points to the tension in the activities of the main representatives of indigenous and optional colon microflora when a pathological process.

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UDC:618.11-008.64:616-06

NEW APPROACHES TO THE DIFFERENTIAL TREATMENT OF HYPERTENSION BY OBESITY IN WOMEN IN THE PERIMENOPAUSAL PERIOD

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Summary. Object to study effects of treatment of obesity on main cardiovascular risk characterictics in premenopausal women. In the study 46 women in perimenopausal period with obesity and arterial hypertension (AH) were recruted. The accomplished investigation demonstrated that the complex obesity therapy with gomeopatic remedy was given successfully results.

Аннотация. Перимнопаузал даврдаги семизлик таъсирида ривожланган Агни коррекциялашдаги полипидемик препаратнинг гомеопатик препарат билан биргаликдаги таъсирини ўрганиш мақсадида 46 нафар климактериксиндромнинг семизлик асосида АГ билан асоратланган аёл кузатув остида даволанди. Натижалар гиполипидемик препарат ва гомеопатик дори воситасининг ижобий таъсирини кўрсатди.

Аннотация. Для оценки влияния гиполипидемического препарата в комбинации с гомеопатическим препаратом для коррекции артериальной гипертензии на фоне ожирения в перименопаузальном периоде наблюдали 46 женщин с различными проявлениями КС с осложненный АГ на фоне ожирения. Данные позволяют считать оправданным назначение комплексного гомеопатического препарата в сочетании с гиполипидемическим препаратом.

Key words: menopause, premenopausa, atherosclerotic lesions, hypertension, dyslipidemia, metabolism, headaches, insomnia, hormone.

Калит сўзлар: менопауза, пременопауза, атеросклеротик ўзгаришлар, гипертензия, дислипедемия,бош оғриғи, метоболизм, уйқусизлик, гормон.

Ключевые слова: менопауза, пременопауза, атеросклеротическиеизменение, гипертензия, дислипедемия, метоболизм, бессоница, гормон.

Actuality of the theme: In menopause transition a lot of women have vasomotor symptoms which may affect their normal daily activities. With the decline in estrogen levels, risk factors for coronary heart disease (CHD) become more apparent, especially hypertension. The onset of hypertension can cause a variety of complaints that are often attributed to the menopause. Risk factor identification is poorly managed in middle-aged women and should be the first step in the evaluation and treatment of women with premenopausal symptoms. With the decline in endogenous estrogenic production after 40 years of age, women gradually develop atherosclerotic lesions with fibrous cap formation. Signs of subclinical atherosclerosis can already be found with intima-media thickness measurements in women before menopause, especially when several CHD risk factors are present. After menopause, atherosclerosis becomes more extended with the involvement of inflammation and the appearance of calcified atheroma's in the vessel wall.

Mean age of the women included in these trials, however, was 43 to 67 years, with a mean interval of 1,5 to 15 years since menopause when the use of HT is no longer appropriate. Hypertension as a key risk factor in menopause, because the loss of ovarian hormones around menopause has many adverse effects on CHD risk factors. Clinical manifestation of CHD occurs ten years later in women compared with men and the risk increases rapidly after the age of 50 years. About 30 to 50% of women develop hypertension (RR >140/90 mmHg) before the age of 50 and the onset of hypertension can cause a variety of symptoms that are often attributed to menopause. Hypertension often clusters with other risk factors such as overweight, elevated insulin resistance, diabetes and lipid abnormalities.

Cardiologists and gynaecologists have recently reached consensus on the importance of CV risk factor assessment as the first step in managing women with premenopausal symptoms.

The aim of study: estimate of efficiency of hypolipidemic remedy and hormone replacement therapy and correction of hypertension by obesity in the premenopausal period.

Material and methods: were investigated about 46 menopausal women at premenopausal period with hypertension shown by obesity I - II in raising aged from 42 to 56 years. Inclusion criteria were women with A/D-140/90 mm Hg and leaching, body mass index (BMI) greater than 25, the ratio of the circumference of waist-to-hip ratio greater than 0.8, i.e. abdominal obesity, combined with dyslipidemia and 20 women with hypertension who are taking anti-hypertensive therapy by appointment cardiologist. Diagnosis of the first and second degree of obesity adjusted for body mass index, and after consultation Endocrinology and technology to eliminate endocrine obesity. These women were noted to increase

blood pressure in history, increasing the pressure started to bother throughout 6-8 months after menstrual irregularities, menstruation become irregular (in 2-3months), developed symptoms of menopause such as hot flashes, heart palpitations, sweating, increased blood pressure, headaches, and insomnia. Women with hypertension by obesity, menopause is included in the core group Remens take 1 tablet per day Xenical and 120 mg per day. The studies were conducted on the basis of 9 PCA for 6 months and in outpatient cardiology department clinics TMA-2. Women were observed regularly every week on active and passive type of visit.

Methods: anthropometric and objective - a daily self monitoring of blood pressure, headaches, seizures, angina. were determined l and lipid spectrum: total cholesterol (TC), LDL cholesterol (LDL) and high (HDL) density, triglycerides (TG). For a complete picture of obesity in clinical practice, the easiest and most common way - calculating the relationship of waist circumference (WC) to hip circumference (HC)-WC/HC.

Results and their discussion. Studies have shown significant disorders of lipid metabolism in women with hypertension by obesity, cuttings and intensity of which depended on the degree of obesity and body mass index. Significant changes in lipid burdened of arterial hypertension and the manifestation of menopausal symptoms. Therapy should be aimed not only at reducing of body weight, but more on the prevention of the development of obesity-related diseases, the improvement of metabolic parameters, and for the retention of relatively progress and that it is very important to solution quality of life of the patient. The measure of obesity is weight loss, the index WC/HC, improved lipid profile, with Xenical treatment led to a natural decrease in body weight, which was achieved in 78, 8% of patients. After 6 months of taking the drug weight loss was 11,8 ± 4,1 kg. The most rapid loss of body weight was observed in the initial 3 months of therapy. By the end of treatment, 68, 7% of patients with reduced body weight by more than 18% of baseline values. Only 6.2% cases are not occured positive effect, it is associated with other extragenital diseases. The treatment of hypertriglyceridemia with xenical was normalized in all degrees of alimentary obesity. Total cholesterol, VLDL cholesterol and LDL cholesterol in patients with 1st and 2nd of obesity and the treatment with Xenical had a tendency to decrease, and at the 2nd b extent these changes were statistically significant in nature. The coefficient of atherogenic decreased by 1.35, 1.47 and 1.33 times, respectively degrees. The therapy can be considered very successful, as the most significant positive changes in the form has decreased in menopause symptoms still as hot flashes, heart palpitations, sweating, increased blood pressure, headaches, and insomnia.

Conclusions

The results obtained suggest that therapy with Remens with Xenical contributes to a reduction of menopausal disorders in women with hypertension by obesity in the premenopausal period. Homeopathy and allopathy are complementary to each other equal treatment to facilitate individualization of therapeutic approaches with minimal side effects.

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UDC: 616-001.516

OPERATION INTRAMEDULLARY NAILING OF THE CLAVICLE USING ILIZAROV SPOKES

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Annotation. This article deals with the results of operations intramedullary nailing of the clavicle with the help of pins of Ilizarov which conducted at theDepartment of general surgery, traumatology and orthopaedics, despite comminuted complex fractures of the clavicle; obtained results are regarded as favorable.

Аннотация: Ушбу мақолада умумий жаррохлик травматология ва ортопедия кафедрасида олиб борилаётган ўмров суягининг Илизаров спицаси ёрдамида интрамедулляр операциялари натижаларига, ўмров суяги мураккаб майдаланиб синиш ҳолатларида, ҳамда ушбу операциялардан олинган натижалари ижобий эканлиги ҳақида сўз боради.

Аннотация: Данная статья посвещено результатами операции интрамедуллярном остеосинтезе ключицы с помощю спицами Илизарова которого проводились на кафедре общей хирургии, травматологии и ортопедии несмотря оскольчатых сложных переломов ключицы; полученные результаты расценены как благоприятный.

Key words: fracture of the clavicle, intramedullary osteosynthesis, Ilizarov’s pin.

Калит сўзлар: ўмров суягининг синиши, интрамедулляр остеосинтез, Илизаров спицаси.

Ключевые слова:перелом ключицы, интрамедулляр остеосинтез, спица Илизарова.

Introductory part

Fractures of collar bone composes 15-18% of the locomotor apparatus breakdown [2; 3]. Yumashev G.S considered in his statistics,that diaphysis of collar bone fracture relatively composes 3-16% of all fractures[6]. It is estimated that three collar middle bones are the most sensitive parts of collar bone. In the damaging direct mechanism weight of the power spread on the outer surface of the shoulder joints, during the tapping on the sides of the shoulder joint S-shaped bruised spread around the collar. Severely scratch of the most sensitive part of the border between the middle part and the outer ends leads to the fracture [2]. However as it given in the scientific publicationsthe only method of treatment of collar bone fractures had not been still worked out.[1].His anatomico-biochemical specific features in the field of microinjuring processes of operative or conservative treatment can lead to various complications [4]. In the case of collar bone fracture operative interventions are performed by using a clamp interbone, and the bone inside, bone surface. On the other hand, bone plates used in operations osteosintez operational practices shortages, lack of operating practice leads to appearing of deep infections in the operative areas and the emergence of fracture heal, treat plates breaking, the operating area and the appearance of cosmetic defects, etc. [5].

Materials and Methods: The collar bone fracture were used in 40 patients with diaphysis. *The Ilizarov's intramedullary pin during intramedullary operation was reviewed in details on the results of the conducted operations*. During intramedullar operations metal pinsat diametersfrom-1,5mm up to 4 mmwere used in accordance with the age of the patients and to fit the size of the collar bone.

During the operation of adult patients at the same time, there were cases where two Ilizarov'spins were used, these conditions helped to stable on the surface of the broken bone. All the operations were made on the classic Portuguese style,during the years of 2014 -2016 at RMPMI patients which were treated in the department of orthopedics and rehabilitation. All operations were conducted in patients aged 18-45, there were 5 patients (12,5%) with broken apart diaphysis of the collar bone. The classic way is performed across the channel pissing peripheral collar bone, fractured bone Ilizarov's pin of the collar bone until the Acromia end by using elektrodrill. Bones broken to touch a flat surface entered with the pin toward the central fragment of 2.0 - 3.0 cm along the bone channel list. Having cutting out using a pin unnecessary metal, bulging of the skin, its finite part half incurvated remains under the skin. Diaphyses oblique radial fractures broken collar bone fragments bound and fixed with metal wire.

Outcome and discussion. In all performed operations, only in 1 out of 40 (2.5%) occurredas a case of migration. In the remaining 39 patients (97.5%) with postoperative complications were not observed. In our opinion, one of the main reasons for the development of successful operations using the Ilizarov's pins is taking with the size of the collar bone in accordance with diameters of chosen metal pins and rather good fixing have been good enough to treat.

After surgery, rentgengraphia was carried outwith all patients, conducted in accordance with a period of 4-5 weeks Kang CASTlitorakobroxial sized dressings.

Conclusion: It is proved that intramedullary osteosynthesitis operations conducted with the help of Ilizarov's pin are less painful and have less effective infectious complications, held for a short time, and they are more effective than intramedullary operations conducted using other fixatives.

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UDC: 616.831-009-053.2/.5:6/2.85

AUDIOLOGICAL HEARING TESTING IN CHILDREN WITH CEREBRAL PALSY

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Annotation. The objectives of the present work were to study and evaluate the state of the acoustic analyzer in children with cerebral palsy. The measurements were made by the so-called evoked otoacoustic emission technique. A total of 67 childrens with various forms of cerebral palsy were available for the examination. Screening of the hearing function by the method of evoked otoacoustic emission was performed using an «Neuro-Audio-Screen» device (Neurosoft, Russia). Analysis of the results of audiological examination indicates that up to 58,3% children showed otoacoustic emission from both ears and from one ear respectively. 41,7 % of the children failed otoacoustic emission screening.

Аннотация. Ушбу илмий мақолада болалар церебрал фалажида эшитув анализаторини скрининг текширувдан ўтказиш масаласи баён

қилинган. Унда 67 та бемор болалар отоакустик эмиссия текширувдан ўтказилганлиги хақидаги маълумотлар келтирилган. Эшитув анализаторининг скрининг текширувдан ўтказишда махсус «Нейро-Аудио-Скрин» (Нейрософт, Россия) аппаратидан фойдаланилди. Изланишлар натижаси шуни кўрсатдики, текширув остидаги 58,3% беморда отоакустик эмиссия аниқланди, қолган 41,7% беморда аниқланмади.

Аннотация. Цель работы-изучение и оценка состояния периферического отдела слухового анализатора у детей с ДЦП, методом вызванной отоакустической эмиссии. Проведено обследование 67детей с различными формами ДЦП. Диагностика слуховой функции методом вызванной отоакустической эмиссии проводилась на приборе «Нейро-Аудио-Скрин» фирмы «Нейрософт» (Россия). При оценке результатов аудиологического обследования вызванная отоакустическая эмиссия зарегистрирована на оба уха у 58,3%, не зарегистрирована у 41,7%.

Key words: otoacoustic emission, cerebral palsy, hearing function.

Калит сўзлар: отоакустик эмиссия, болалар церебрал фалажи, эшитув анализатори.

Ключевые слова: отоакустическая эмиссия, детский церебральный паралич, слуховой анализатор.

Introduction. Cerebral palsy (CP) is one of the more common congenital problems in pediatric neurology [1,2]. Its importance is determined by the increasing prevalence and social significance of the disease, and holds one of the avant-garde positions among disabling diseases of children and adolescents. Currently, there is a steady increase in the number of patients with cerebral palsy. The frequency of cerebral palsy in foreign countries is about 2-3 per 1,000 newborns, in Uzbekistan - 8.9 cases per 1,000 live births.

Cerebral Palsy represents a group of disorders of variable etiology and variable clinical presentation. Cerebral palsy is known to have a higher risk association with other disabilities. These risks include, but are not limited to: seizures 35-45%, intellectual disability-40-60%, visual impairments-20-60%, communication impairments, including hearing-30%, feeding difficulties, behavioral and other. This disorders requires the participation of, respectively in medical and social rehabilitation various specialists (neurologist, orthopedic surgeon, psychiatrist, otolaryngologist, ophthalmologist, psychologist, speech therapist, teacher and etc.). This allows to get 80% of the positive dynamics of the flow disease in children with various forms of cerebral palsy. [2]

It is known that in the development of speech is of great importance prelingual or preparatory period which lasts during normal development from birth until the end of the first year of life. During this period begins to develop visual and auditory perception, formed the initial objective and game activity, the ability to imitate the sounds of speech, one word appears necessary prerequisites for the child to communicate with the people around him. [3,4] Children with cerebral palsy have features of speech development, even a cry of the newborn can serve as

a diagnostic criterion. A normal baby cry loud, clear, with a deep breath and extended output, and in children with cerebral palsy cry in the first week of life may be absent, or has a painful character.

The disorder of speech is closely associated with the defeat of the general motor skills and speech [5,6]. As speech is a complex multi-level functional system, the children is an important correction of speech disorders parallel study of auditory function.

It is well known that the earlier identified hearing impairment and rehabilitation starts, the better the performance of the speech and psychosomatic development of the child. Hearing Research in children with cerebral palsy is a complex problem requiring highly skilled professionals from the training. Currently, one of the most common and affordable methods of screening hearing test is the otoacoustic emission (OAE). The most effective system for early identification of children with hearing impairment involves the first phase of registration of the OAE, which reveals the fact of hearing abnormalities ("pass / fail")

Objective: to study the prevalence and nature of the pathology of the auditory analyzer in young children with various forms of cerebral palsy by screening.

Materials and methods. The material of this study covers 67 (134 ears) of children with various forms of cerebral palsy (Table №1). Screening group were children from 6 to 16 years, boys- 36 (53.7%) and girls with 31 (46.3%). The largest number of 47 (71%) children had a common forms of cerebral palsy (spastic diplegia, hemiparetic, atonic-astatic form). With the most severe (hyperkinetic and bilateral hemiplegia) were - 20 (29%) children.

Pic.1. The percentage of CP cases by sex

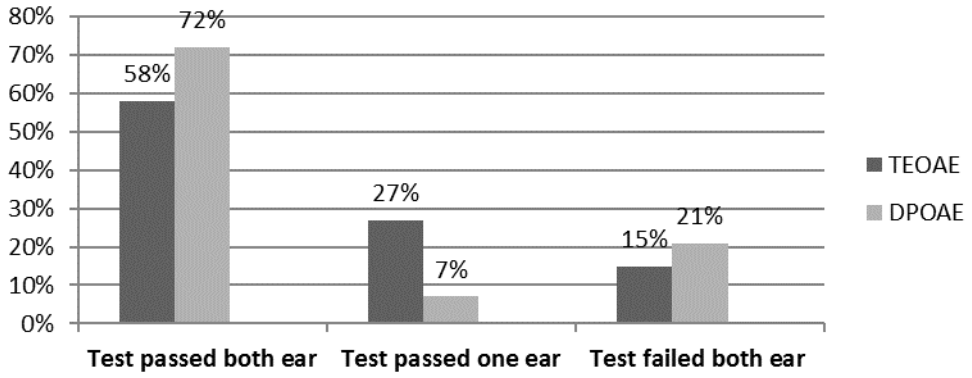
Tab.1.

DISRUPTION OF CHILDREN BY FORMS OF CEREBRAL PALSY

Forms of CP	**Children from 6 per 10**		**Children from 11 per 16**		***TOTAL***
	M	**F**	**M**	**F**	
1. spastic diplegia	**2**	**3**	**5**	**5**	***15***
2. hemiparetic	**5**	**3**	**7**	**4**	***19***
3. atonic-astatic form	**3**	**2**	**5**	**3**	***13***
4. hyperkinetic form	**1**	**2**	**5**	**2**	***10***
5. bilateral hemiplegia	**2**	**2**	**3**	**3**	***10***
TOTAL:	***13***	***12***	***25***	***17***	**67**

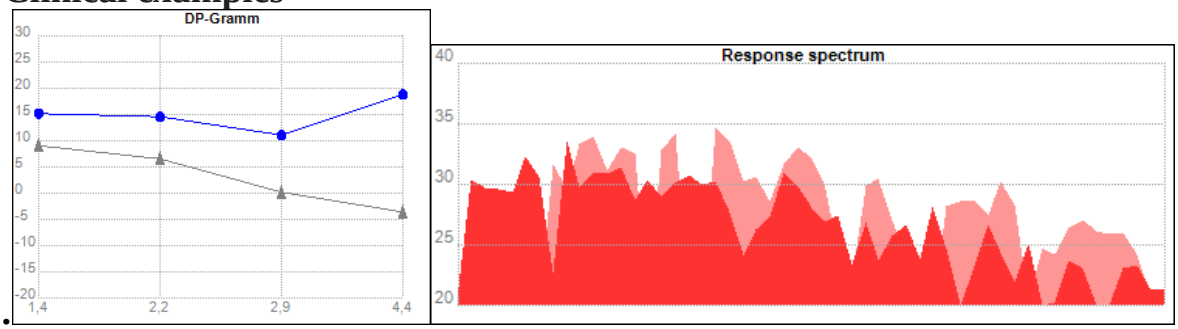
The study of auditory function was examined on the device "Neuro-Audio-Screen" Company Neurosoft (Russia) TEOAE two classes: transient evoked otoacoustic emission (TEOAE) and emission at the frequency distortion product (DPOAE). All studies were conducted in soundproof chamber in the waking state. To exclude results pseudo-deafness, all children held otorhinolaryngological examination to detect inflammation in the nasal cavity, oropharynx, external and middle ear, estimated the number of cerumen in the ear canal, and at the same time define the personality of the size of the insert for each child.

Conducting DPOAE revealed the following results: 67 of the child test is passed in both ears in 39 children (78 ears), in one ear - in 18 children (36 ears), the test failed on both ears in 10 children (20 ears). Conducted simultaneously study of auditory function by TEOAE gave somewhat different results: 67 of the child test is passed in both ears in 48 children (96 ears), in one ear - in 5 children (10 ears), the test fails on both ears in 14 children (28 ears). (pic.2.)



Pic. 2. RESULTS OF TESTING OF HEARING FUNCTION BY TEOAE AND DPOAE

Clinical examples

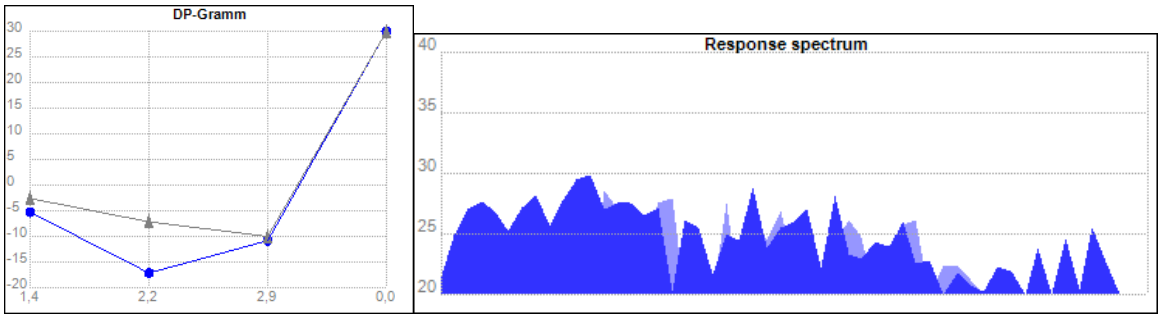


A. B.

PIC. 3. RESULTS OF TRANSIENT EVOKED OTOACOUSTIC EMISSION IN PATIENT X.

a- transient evoked otoacoustic emission –test passed in both ears;

b- otoacoustic emission at the frequency distortion product- test passed in both ears;



A. *B.*

PIC. 4. RESULTS OF TRANSIENT EVOKED OTOACOUSTIC EMISSION IN PATIENT T.

a- transient evoked otoacoustic emission –test FAILED in both ears;

b - otoacoustic emission at the frequency distortion product- test FAILED in both ears;

Results. We studied 67 children with various forms of cerebral palsy. All patients underwent a comprehensive study: study of complaints, medical history of the child, much attention was paid to the mother obstetric history, and carefully about otorhinolaryngological history (ENT- diseases).

Most of the surveyed children (45) were born preterm (24 to 36 weeks gestational age), post-term (2), with a history of consanguineous marriages (19) and the twins - 1 child.

The position of tympanic picture in children with middle ear pathology characterized by a set of the most common signs: retraction of the tympanic membrane, light distortion reflex color change and presence of air bubbles. The prevailing was retraction of the eardrum which is usually accompanied by deformation of the light cone. How contact was established with all the symptoms associated hypertrophy of adenoid vegetations, and a chronic process.

All children performed optoacoustic emission distortion product. In neither case, we have not received an answer that confirmed the existence of sensorineural

hearing loss. The registration process is done automatically artifact rejection implementations activity, characterized a high level of background noise or not stable level test tones. Register DPOAE for a couple of tones automatically stopped the allocation DPOAE or after a specified time Registration consistently tested the right and left ear. Overall the duration of the survey was 10-20 minutes. The intensity of the stimuli used in the range of 50 to 70 dB, and the level of the two tones were identical or differed 5-10 dB. Based DPOAE amplitude measurements obtained bypresentation of tones of different frequencies, automatically builds DP -gram - DPOAE graph of amplitude versus frequency tone. For each point of the curve was calculated as the background noise level. DPOAE amplitude greater than the noise level of not less than 3 dB.

According otoacoustic emission, auditory analyzer revealed pathology in children with cerebral palsy, which was 41,7%. So, the study of hearing at an early age by using screening methods contributes to the timely detection of hearing impairment.

Conclusions:

1. It was found that in patients with cerebral palsy occur both conductive and sensorineural hearing loss. Causes of conductive hearing loss in children with cerebral palsy are exudative otitis media (14%), adhesive otitis media (24%), chronic suppurative otitis media (19%), the adenoids (20%) (observed abnormality in the structure of soft and hard palate, and also shortened the bridle).

2. The high prevalence of latent occurring diseases of middle and inner ear in early childhood in patients with cerebral palsy accompanied by hearing loss, leads to the need for mandatory audiological examinations.

3. Early diagnosis of acoustic analyzer pathology provides timely correction of hearing - speech disorders in children with cerebral palsy.

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UDC:618.3-06:618.36-002

UP-DATE PROBLEM OF PREECLAMSIYA AND IT S THEORY OF DEVELOPMENT

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Summary. In that article are analyzied modern opinion of author by reins development of preeclamsiya, risk of factors and prediscope of factors in organs of women for development current pathology in aim. Information is showed that preeclamsiya is not only reason of death of mothers and babies but is become array haemorrhage and pus-septic complication.

Аннотация. Мазкур мақолада муаллифларнин гпреэклампсия муаммоси ва унинг ривожланиш назариялари ҳақида замонавий қарашлари, ривожланишидаги хавф омиллар таъсири ва аёл организмидаги мойиллик омиллари таҳлил килинади. Маълумотлар таҳлили шуни кўрсатадики, преэклампсия нафақат оналар ва болалар ўлимининг бевосита сабабчиси ҳисобланади, балки массив конкетишилар ва йирингли-септикжараёнларкабиасоратларнихамкелтирибчиқаради.

Аннотация. В данной статье анализируются современные мнение авторов по поводу развития преэклампсии, факторы риска и предрасполагающие факторы организма женщин для развития данной патологии в целом. Данные позволяют считать, что преэклампсия является не только непосредственной причиной материнской и младенческой смертности, но и индуктором многих случаев массивных кровотечений и гнойно-септических осложнений.

Key words: Preeklampsia, bleeding, edema, extrahenital diseases, perinataly deads, proteinuriya, hipertensia, hipovolemy, uterus-placentary inadequacy.

Калит сўзлар: Преэклампсия,перинатал ўлим, қон кетиш, экстрагенитал касалликлар,шиш,бачадон-йўлдош етишмовчилиги,гипертензия,гипоксия, гиповолемия, протеинурия.

Ключевые слова: Преэклампсия, Перинатальная смертность, кровотечения, экстрагенитальные заболевания, гипертензия, протеинурия, отеки, маточно-плацентарной недостаточность, гипоксия, гиповолемия.

Preeclampsia, either alone or superimposed on another disorder, is a major cause of maternal and fetal death and the leading cause of premature delivery worldwide. Underappreciated is the strain that preeclampsia places on the health care resources of all nations. This disease increases the need for neonatal intensive care; in addition, early birth may lead to health problems later in life. Considerable evidence suggests that premature delivery increases the incidence of remote cardiovascular and metabolic health problems, which themselves create enormous economic health burdens. Thus, the ability to predict or prevent preeclampsia or the development of therapy that safely prolongs gestation would be a major advance in prenatal care [1,3,4].

Preeclampsia, a heterogeneous, multisystem disorder defined by the new onset of hypertension and proteinuria after 20 weeks of gestation, affects 2 to 5% of pregnancies worldwide. Preeclampsia is associated with high risks of iatrogenic preterm delivery, intrauterine growth restriction, placental abruption, and perinatal mortality, along with maternal morbidity and mortality. Proteinuria and elevated blood pressure are diagnostic criteria for preeclampsia, but the clinical presentation is variable. The Elecsys immunoassays for sFlt-1 and PlGFhave received Conformité Européenne (CE) marking for use as in vitro medical devices. The sFlt-1: PlGF ratio has been approved as a diagnostic aid for preeclampsia in conjunction with other clinical findings [3,4].

There is a need for a reliable predictor of preeclampsia (particularly its absence) in the short term in women with suspected preeclampsia. Women with suggestive symptoms or signs are often hospitalized until preeclampsia and related adverse outcomes have been ruled out. Others who require hospitalization may be overlooked. Although no preventive or therapeutic strategy is yet available, with the exception of low-dose acetylsalicylic acid, which has a moderate preventive effect in high-risk pregnancies after the first trimester, clinical experience suggests that early detection and monitoring are beneficial [1,5].

The cause of preeclampsia is incompletely understood, but the disorder is thought to be due to placental malperfusion resulting from abnormal remodeling of maternal spiral arteries. In preeclampsia, circulating maternal serum levels of soluble fms-like tyrosine kinase 1 (sFlt-1) are increased, and placental growth factor (PlGF) levels are decreased. An antagonist of PlGF and vascular endothelial growth factor, sFlt-1 causes vasoconstriction and endothelial damage that may lead to fetal growth restriction and preeclampsia. A high ratio of sFlt-1 to PlGF is associated with an increased risk of preeclampsia and may be a better predictor of risk than either biomarker alone. PROGNOSIS (Prediction of Short-Term Outcome in Pregnant Women with Suspected Preeclampsia Study) was designed to investigate the value of using the sFlt-1: PlGF ratio for the prediction of the presence or absence of preeclampsia in the short term [3,4,5].

Several investigations have suggested that preeclampsia may be associated with the development of cardiovascular disease, renal disease, and cardiovascular risk factors for several years after pregnancy. Other studies have shown increased rates of microalbuminuria up to 5 years after pregnancy in women with previous preeclampsia, a finding that is compatible with the presence of underlying unrecognized renal disease or a damaging effect of preeclampsia on the kidney. It is uncertain whether these associations are explained by adverse effects of preeclampsia itself or by underlying risk factors that predispose women to both preeclampsia and later cardiovascular and renal disease [2,3.4].

We previously reported that preeclampsia in a woman's first pregnancy is a risk marker for undergoing a kidney biopsy later in life. However, it is not known whether preeclampsia is associated with end-stage renal disease (ESRD) and, if so, whether a history of preeclampsia in more than one pregnancy increases this risk.

Preeclampsia is a leading cause of maternal and neonatal death in the United States and worldwide, yet effective strategies are lacking for prevention and treatment. Since delivery remains the only "cure," preeclampsia is a major cause of iatrogenic prematurity. Although the pathogenesis of preeclampsia is not completely understood, altered levels of angiogenic factors appear to play a role. Elevated levels of soluble fms-like tyrosine kinase 1 (sFlt-1; an inhibitor of vascular endothelial growth factor), reduced levels of placental growth factor (PlGF), and an increased sFlt-1: PlGF ratio have been reported both in women with established preeclampsia and in women before the development of preeclampsia. However, the values in women in whom preeclampsia develops overlap with the values in women in whom preeclampsia does not develop, and it has been unclear whether these values can be used to discriminate between these women in practice. Prospective studies assessing whether the levels of these angiogenic factors early in pregnancy (before 20 weeks of gestation) could predict preeclampsia have yielded disappointing results. However, prospective single-center studies of women later in pregnancy have suggested that the sFlt-1: PlGF ratio may be useful as a diagnostic aid for triaging women with singleton pregnancies and suspected preeclampsia [4,5].

Caring for women who present with elevated blood pressure in the second half of pregnancy, without other signs of preeclampsia, can be extremely challenging. The presentation may reflect gestational hypertension, previously undiagnosed chronic hypertension (which may go unnoticed earlier in pregnancy, when blood pressure typically falls), or an early stage of preeclampsia. With monitoring and treatment as indicated, women with gestational hypertension and chronic hypertension generally have good pregnancy outcomes. However, preeclampsia requires careful inpatient monitoring of both the mother and the fetus and possibly early delivery. Given the uncertainty and the serious maternal and fetal risks associated with preeclampsia, women presenting with hypertension after 20 weeks of gestation are often hospitalized for evaluation and monitoring, with substantial attendant costs. Therefore, a test that could help clinicians decide which women can be followed safely on an outpatient basis and which women need to be admitted to the hospital would be of great benefit [1,3,4].

As the authors acknowledge, a randomized trial is needed to determine the effects of the use of the ratio, as compared with usual care, in triage decisions. Of particular interest would be its effects on the rates of hospitalization, preterm delivery, and other adverse pregnancy outcomes, as well as on the costs of care. Meanwhile, because a low sFlt-1: PlGF ratio has a very high negative predictive value for the development of preeclampsia and HELLP, the use of the ratio has a role in identifying women with singleton pregnancies and suspected preeclampsia who have a very low risk of the development of preeclampsia in the ensuing week.
Soluble fms-like tyrosine kinase 1 (sFlt1) (also known as soluble vascular endothelial growth factor [VEGF] receptor 1 [sVEGFR1]), a circulating antiangiogenic protein that sequesters the proangiogenic proteins placental growth factor (PlGF) and VEGF, is increased before the onset of clinical disease in the

circulation of women with preeclampsia. Circulating levels of sFlt1 correlate with the severity of preeclampsia and proximity to the onset of hypertension or proteinuria. Serum free PlGF and free VEGF levels are decreased before the development of preeclampsia.

Overexpression of sFlt1 in pregnant rats results in a preeclampsia-like phenotype. Furthermore, anti-VEGF therapy in patients with cancer has been associated with hypertension, proteinuria, and the reversible posterior leukoencephalopathy syndrome, which are hallmarks of preeclampsia and eclampsia. Therefore, an imbalance in circulating angiogenic factors may be associated with vascular endothelial dysfunction and the maternal syndrome of preeclampsia. Endoglin, a coreceptor for transforming growth factor β1 and β3 (TGF-β1 and TGF-β3, respectively), is highly expressed on cell membranes of vascular endothelium and syncytiotrophoblasts. Placental endoglin is up-regulated in preeclampsia, releasing soluble endoglin into the maternal circulation. Soluble endoglin is an antiangiogenic protein that may inhibit TGF-β1 signaling in vasculature. In one study, overexpression of soluble endoglin in rodents by means of adenoviral vectors led to increased vascular permeability and induced modest hypertension without significant proteinuria. Adenoviral-mediated overexpression of both sFlt1 and soluble endoglin caused severe vascular damage, nephrotic-range proteinuria, severe hypertension, a syndrome similar to the HELLP syndrome (hemolysis, elevated liver enzymes, and low platelets), and fetal growth restriction. Thus, soluble endoglin and sFlt1, two antiangiogenic proteins operating through separate mechanisms, may combine to produce endothelial dysfunction and severe preeclampsia.

Research on the disease was neglected and sporadic until about 20 years ago. Since then, both basic and translational research concerning preeclampsia have increased exponentially and, as a result, we now have a plethora of information supporting several plausible hypotheses about the cause of the disorder, including the roles of oxidative stress, inflammation, and circulatory maladaptation, as well as humoral, mineral, or metabolic abnormalities. Here we focus on the roles of circulating antiangiogenic factors in the pathogenesis of the most dangerous phenotypes of preeclampsia, as well as on the article by Levine et al [1,3,4].

In 2003, Maynard observed that soluble fms-like tyrosine kinase 1 (sFlt1), a protein that binds (and inactivates) the proangiogenic proteins vascular endothelial growth factor (VEGF) and placental growth factor (PlGF), was among the genes up-regulated in the placentas of women with preeclampsia. These investigators, also involved in research on cancer and basic vascular biology, were familiar with the adverse effects (e.g., hypertension and proteinuria) of certain antiangiogenic compounds used to treat tumors. Thus, they focused on sFlt1, hypothesizing that it entered the maternal circulation, where it bound free (active) VEGF and PlGF, and that excessive circulating sFlt1 would create an imbalance between intravascular antiangiogenic and proangiogenic factors, leading to the preeclampsia syndrome.
Indeed, maternal sFlt1 levels were increased in women with preeclampsia, and levels of free VEGF and PlGF were decreased. Taking clinical observations to the

bench, Maynard et al. then showed that serum from women with preeclampsia, as well as sFlt1 itself, inhibited both angiogenesis and renal arteriolar vasodilatation in vitro (these phenomena were reversed with VEGF). The highlight of their studies was the observation that adenoviral vector–mediated overexpression of sFlt1 in pregnant rats resulted in hypertension, albuminuria, and glomerular endotheliosis (the renal lesion characteristic of preeclampsia in humans), which established a plausible explanation for two of the phenotypes of the disease, hypertension and proteinuria, and created a potential animal model. However, preeclampsia is a multisystem disorder, and absent from this model were other serious manifestations of this disease seen in women, including liver involvement, microangiopathic hemolytic anemia, and generalized vascular "leakiness."

The observations by Levine et al. place the measurement of angiogenic proteins at the forefront of tests that are potentially useful for predicting preeclampsia. These investigators had already suggested the use of angiogenic proteins for prediction when they measured samples stored from a previous prevention trial, noting elevated sFlt1 levels and decreased circulating free VEGF and free and urinary PlGF levels approximately 5 weeks before overt preeclampsia. Others reported similar findings.Levine et al. have now combined soluble endoglin levels and sFlt1:PlGF ratios, measured in stored samples from the same study, and show that this combination markedly increases the odds ratio for predicting both early and late preeclampsia, the most striking observation being the prediction of severe outcomes (e.g., early preeclampsia, fetal growth restriction, and perhaps the HELLP syndrome [hemolysis, elevated liver enzymes, and low platelets]) as much as 10 weeks before the onset of clinical manifestations. It is important to note that levels were not elevated in patients who were destined to have gestational hypertension or to remain normotensive but deliver growth-restricted neonates. Thus, the authors now have strong evidence to suggest the usefulness of these proteins in predicting preeclampsia, and they propose proceeding to prospective studies. They further conclude that their data, when combined with the reports of animal models, constitute evidence that circulating soluble endoglin and sFlt1, each causing endothelial dysfunction by different mechanisms, act in concert to mediate the maternal syndrome of preeclampsia.

What can we make of all this? The World Health Organization (WHO) has just initiated a large prospective, observational study to evaluate the usefulness of sFlt1, soluble endoglin, and PlGF in the prediction of preeclampsia (Villar J, Widmer M: personal communication). The WHO study will take place in developing nations, where maternal and fetal deaths from preeclampsia are greatest and tertiary care facilities are limited. Validating tests to predict preeclampsia before onset could conceivably reduce maternal and fetal deaths in these nations by guiding the allocation of their limited capacities for tertiary care or the close surveillance by appropriate caregivers. Therapeutic studies involving the animal models described above are under way, and preliminary results suggest that VEGF-121 can reverse the hypertension, proteinuria, and renal lesions in the sFlt1 model [1,3,4,5].

In conclusion, growing evidence links antiangiogenic factors to preeclampsia phenotypes. There are still unknowns — for example, why is sFlt1 up-regulated in the placentas of women with preeclampsia, and what is the mechanism of proteolytic cleavage leading to an increased generation of soluble endoglin? But we can now confidently state that a disorder once considered a mysterious disease is sufficiently understood to permit mechanistically rational studies of its prediction, diagnosis, prevention, and treatment [2,4].

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UDC:612.017

THE IMPACT OF PLANT COLLECTIONS AT IMMUNOGENESIS WITH ACUTE TOXIC HEPATITIS IN EXPERIMENTATION

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Summary: It was found that infusions of fireweed, “filipil” and “tribulipil” have the ability to repeatedly increase the number of antibody forming cells in the spleen and anti body titer to sheep erythrocytes in the peripheral blood of mice with acute toxic hepatitis.

Резюме. Мақолада кипрей, “филипил” ва “трибулипил” дамламалари талоқдаги антитело ҳосил қилувчи хужайралар сонини бир неча бараварга ошириш хусусиятига эга бўлиб, шунингдек ўткир токсик гепатит билан касалланган каламушларнинг периферик қонидаги куйларнинг эритроцитларига бўлган антителолар титрини хам ошириши баён қилинган.

Резюме: В статье анализировано что, настои кипрея, «филипила» и «трибулипила» обладают способностью в несколько раз повышать число антителообразующих клеток в селезенке, также титр антител к эритроцитам барана в периферической крови мышей с острым токсическим гепатитом.

Keywords: fireweed, filipil, tribulipil, antibody forming cells, sheep erythrocytes, splenocyte, herbal infusions.

***Кал*ит сўзлар:** кипрей, филипил, трибулипил, антитело ҳосил қилувчи ҳужайра, қўй эритроцити, спленоцит, ўсимликлар дамламаси.

Ключевые слова: кипрей, филипил, трибулипил, антителообразующих клеток, эритроцит барана, спленоцит, растительный настой.

Currently herbal medicines widely used for treating various diseases, particularly in the treatment of liver pathologies (1,3,4,6,7). Previously, it was found that the plant collections "Philip" and "pribulipil" have anti-inflammatory (5) and immunomodulatory (2) activities.

The purpose of this study is to investigate the effect of these charges on immunological parameters in acute toxic hepatitis (ATH).

Material and methods. In experiments were used outbred white mice weighing 20-22 g. For modeling them ATH subcutaneously mice were injected in the femoral region 20% oil solution of carbon tetrachloride (CCl4) 0.2 ml for 3 days. On the day of the last administration of CCl4 them once intraperitoneally immunized with sheep red blood cells (SRBC) in a dose of 2 × 108. Then, during 4 days they were administered intragastrically investigated plant extracts. The animals were divided into 5 groups of 7 animals.

Group 1 received only the DL (control). Group 2 - OTG + DL. Group 3 - OTG + EB + infusion of fireweed (1:10); administered at a dose of 15.0 ml / kg. Group 4 - OTG + EB + infusion "tribulipila" (1:10); administered at a dose of 15.0 ml / kg. Group 5 - OTG + EB + infusion of "Philip" (1:10); administered at a dose of 15.0 ml / kg.

The composition of infusion following four plants are: Cyprus, Tribulus, yarrow, calendula (in a ratio of 25: 25: 25: 10 gr.). The structure of "tribulipila" infusion include Cyprus and Tribulus (in the ratio 1: 1).

On day 5 after immunization were determined by the number of antibody-forming cells (AFC) in the spleen of the direct method of local hemolysis by Jerne and Nordin (1963), as well as the total number of nucleated spleen cells (TNNSCKS) (8). In peripheral blood antibody titer was determined to SRBC.

Table. 1

Effect of plant extracts of the immune response to sheep erythrocytes in mice with acute toxic hepatitis (OTG) (M ± m, n = 7)

Group	Substance dose, ml / kg	Quantity TNNSCKS 10x6	RI	Quantity on the antibody-forming cells			
				the spleen	RI	10^6 spleen cells	RI
1.Kontrol	-	151,6 ± 9,0	-	3807,1 ±237,9	-	25,9 ±2,7	-
2.ATH	-	101,1 ± 4,5[a]	-1,50	850,0 ±58,8[a]	-4,48	8,5 ±0,7[a]	-3,05
3. ATH + infusion fireweed	15,0	122,3 ± 7,3[аб]	+1,21	1892,9 ±127,9[ab]	+2,23	15,9 ±1,9[ab]	+1,87
4. ATH + infusion of "tribulipila »	15,0	132,4 ± 6,6[б]	+1,31	2571,4 ±177,6[abc]	+3,0	19,7 ±1,7[b]	+2,31
5. ATH + infusion "philip »	15,0	127,3 ± 6,0[аб]	+1,26	2228,6 ±155,4[ab]	+2,62	17,8 ±1,6[ab]	+2,1

Note: TNNSCKS - nucleated spleen cells, integrated circuits - the ratio of the index (-) with respect to 1 g, (+) - in relation to 2 g, and - significantly for 1 c, b - significantly to 2 c,.in - reliably to 3 g, z -. significantly to 4 m.

Results and discussion. As shown in Table 1 in the spleens of the mice in the control group formed 3807,1 ± 237,9AFC. In the process of forming the deep ATH secondary immunodeficiency: the total number of the AFC in the spleens of mice reduced to 4.48 times as compared to the intact group and it amounts to 850,0 ± 58,8. With the introduction of herbal infusions on mice with ATH comes a significant increase in immune response to SRBC. From three plant substances most active have infusion of "tribulipila" and the infusion of "Philip": the number of AFC in the spleen increased respectively by 3.0 and 2.62 times. Infusion enhances fireweed immunogenez mice ATH by 2.23 times.

Thus, these data indicate the ability of the studied herbal infusions to some extent correct the depressed immune response to SRBC in mice with ATH. In all cases, the number of AFC in the spleen is significantly lower than the control group. In other words, the full restoration of immunological reactivity in the pathology and treatment of liver herbal infusions are not observed.

It should be noted that the immunostimulatory activity of infusion "tribulipila" significantly higher than the infusion of fireweed. Activities infusion and infusion fireweed "Philip" was not significantly different from each other.

AFC Calculation for 1 million spleen cells showed that it is equal 25,9 ± 2,7 (Table 1) in the control group. In the group of mice with ATH, do not get herbal infusions, the number of AFC for 1 million splenocytes is 8,5 ± 0,7, in 3.05 times lower than the control values. Therefore, when the number of AFC per 1 million spleen cells decreases to a lesser extent than in the calculation of AFC to the whole

spleen (RI = -4.48). When administered to mice with fireweed infusion ATH number of AFC for 1 million spleen cells increased in 1.87 times, infusions "tribulipila" - in 2.31 times and infusion "Philip" - in 2,10 times. The greatest activity possesses infusion "tribulipila", and the least - the infusion of fireweed. Under the influence of infusion "tribulipila" AFC for 1 million spleen cells rises to the level of the control values.

Thus, the counting results as AFC whole spleen, and at 1 million splenocytes indicates that the investigated plant extracts are able to stimulate oppressed immune responsiveness in the pathology of the liver.

As can be seen from Table 1 the total number of TNNSCKS in control is equal 151,6 ± 9,4'106. Under the influence of hepatotropic poison (CCl4) significantly reduced the number of TNNSCKS for 1.5 times. It was found that under the influence of infusions fireweed, "tribulipila" and "Philip" observed a significant (compared to the untreated group) increase in the number TNNSCKS respectively in 1.21, 1.31 and 1.26 times. Under the influence of infusion "tribulipila" the total number of splenocytes approaching to the control values.

The next step was to study the effect of herbal infusions on the antibody titer to SRBC in the peripheral blood of mice with ATH (Table 2). In the late-control group antibody titer to SRBC is 6,3 ± 0,2. At ATH observed the weakening of antibody forming process. Thus, to SRBC antibody titers in the blood compared to control it is reduced by 1.85 times and amounts to 3.4 ± 0.2.

Table. 2

Effect of herbal infusions for antibody titer to sheep erythrocytes in the blood serum of mice with acute toxic hepatitis (ATH) (M ± m, n = 7)

Group	substance dose ml / kg	Titre of antibody	RI
1.kontrol	-	6,3 ± 0,2	-
2 ATH	-	3,4 ± 0,2[a]	-1,85
3. ATH + infusion fireweed	15,0	4,4 ± 0,2[ab]	+1,29
4. ATH + infusion of "tribulipila »	15,0	5,0 ± 0,2[ab]	+1,47
5. ATH + infusion "philip »	15,0	4,7 ± 0,2[ab]	+1,38

(Log2) EC

Note: RI- ratio index (-) with respect to 1 g, (+) - in relation to 2 g, and - significantly for 1 c, b - significantly to 2 g in - reliably to 3 c.., g - significantly to 4 m.

It was found that under the influence of all studied plant there is a significant increase in antibody titer to SRBC in the peripheral blood of mice with ATH. So, with the introduction of infusion fireweed antibody titer to SRBC as compared to the immunodeficient group increased significantly to 1.29 times infusions "tribulipila" - in 1.47 times infusions "Philip" - 1.38 times.

Thus, these results demonstrate the ability of the studied herbal infusions to increase a reduced level of antibody titer to SRBC in mice with ATH.

it can be concluded on the basis of the data that extracts fireweed, "Philip" and "tribulipila" are quite effective immune modulating agents capable to correct irregularities in the immune status of the pathology of the liver.

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UDC: 616.61-002.616:12-089

THROMBOCYTE AGGREGABILITY AND HEMODYNAMICS IN THE GLOMERULONEPHRITIS

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Annotation. The thrombocyte aggregability (TA) and central, peripheral, renal hemodynamics were studied in relation to therapy in patients with acute, chronic, lupus nephritis (AGN, ChGN, LN). The investigation showed that it was noted the increase TA in the cases of AGN, ChGN and LN with nephricotic form and decrease after pathogenic therapy. TApatients with latent variants of GN was in normal limited as before, so as after symptomatic therapy. In all forms of GN it was noted hypokinetic type of hemodynamics, considerable aggravation of renal hemodynamics: decreaseof effective renal plasma flow (ERPF) and blood flow (ERBF), increase of renal vascular resistance (RVR).

Аннотация.Убольныхострым, хроническимиволчаночнымнефритом (ОГН,ХГН, ВН) изучалась агрегационная активность тромбоцитов (ААТ), центральная, периферическая ипочечная гемодинамика подвлиянием проводимой терапии. При ОГН, ХГН и ВН с нефротическим синдромом отмечалось повышение ААТ, которое под влиянием патогенетической, антиагрегантной терапии существенно снижалась. При латентных формах ГН ААТ оставалась низкой и симптоматическая терапия не оказывала на неё действия. Во всех обследованных группах отмечались гипокинетический тип гемодинамики, ухудшение почечного кровотока и плазмотока, рост почечного сосудистого сопротивления.

Аннотация.Ўткир, сурункали, люпус-нефрит (ЎГН, СГН, ЛН) билдан оғриган беморларда тромбоцитларнинг ёпишқоқлик фаоллиги (ТЁФ), марказий, периферик ва буйрак гемодинамика ҳолати ўтказилган даволаш таъсирида ўрганилди. ЎГНда, СГН ва ЛН нефротик шаклларида ТЁФ ошганлиги ва патогенетик даво, антиагрегантлар (АА) қўллаш натижасида пасайганлиги аниқланди. ГН латент шаклларида ТЁФ паст бўлиб, назорат гурух натижаларидан фарқ қилмади ва симптоматик даво ТЁФ таъсир кўрсатмади. ГНни ҳамма текширилган шаклларида гемодинамиканинг гипокинетик тури, самарали буйрак қон ва плазма айланишининг сезиларли даражада ёмонлашиши, буйрак томирлар қаршилигининг ошиши кузатилди.

Keywords: glomerulonephritis, thrombocyte aggregability, hemodynamics, renal plasma flow, renaland blood flow, lupus nephritis.

Калитсўзлар: гломерулонефрит, тромбоцитларнинг ёпишқоқлик фаоллиги, гемодинамика, буйрак қон айланиши, буйрак плазма айланиши, люпуснефрит.

Ключевые слова: гломерулонефрит, агрегационная активность тромбоцитов, гемодинамика, почечный кровоток, почечный плазмоток, волчаночный нефрит.

The urgency of the problem. The role of immunoinflammatory mechanisms in the pathogenesis of glomerulonephritis (GN) is not in doubt. The course and outcome of the disease is largely determined by secondary processes: changes in the hemostatic system, changes in blood rheology, disturbances inrenal and systemic hemodynamics, microcirculation. By-way research of platelet aggregation activity (AAT), divergencyof results, the lack of work while studying platelet haemostasis and hemodynamic both in active and latent forms of GN determines the need for scientific research in this direction.

Objective: To study platelet aggregation activity and hemodynamics in patients with acute, chronic and lupus GN (AGN, CGN, LN) in view of the therapy.

Materials and Methods. The study involved 165 patients with glomerulonephritis. In the 1st group there were 15 patients with AGN. In the second groupthere were 92 CGN patients: of these 72 patients with nephrotic form of CGN (NF CGN), 20 - with CGN with isolated urinary syndrome (CGN IUS). Group 3was consisted of 58 patients with LN: 18 people from LN with nephrotic syndrome (LN NS), 17 patients with active LN (ALN), 23 patients with latent LN (LLN). The control group consisted of 15 healthy people of comparable age. In all patients were studied AAT, central and peripheral hemodynamics methods EchoKG, tetrapolar rheography (TPRG), effective renal blood flow (ERBF) and the plasma flow (ERPF) by radioisotope renography. The patients were examined before the start of medical treatment provided to lack of receiving antiplatelet agents (AA) and other drugs in the prehospital phase. The choice of therapy was carried out in view of nosology, clinical variant of the disease, coagulation and AAT. In 42 patients (5 people with AGN, 17 patients with CGN, 20 with LN) were investigated the AAT and peripheral hemodynamics in 1, 3, 6 months after discharge from hospital.

Results and Discussion. In the course of the studyit was found that the clinical forms of GN with nephrotic syndrome (NS): AGN, NF CGN LN NS - have a high AAT with forming larger and stronger platelet aggregates. AAT rises among LNNS - NF CGN - AGN. Significant difference AT by indicators AT(IAT) is installed between the above three groups on the one hand and the other a control group. Latent options GN (CGN IUS, LLN), ALN proceed without changing the platelet aggregation, characterized with the formation of unstable platelet aggregates, undergoing disaggregation process. IAT with latent cases of GN and ALN are not different from the results of the control group. Theadministering therapeutic remedies must be decided individually in each case of GN. So when AGN, NF CGN, LN NS is necessary to include AA in a comprehensive scheme of pathogenetic therapy. Along with the numerous processes leading to an increase of the functional activity of platelets in NShypoalbuinemia, hyperlipidemia, hypercholesterinemia are important. Plasma transfusion liquid portion of the interstitial space at the NS results in a clotting of the blood, increasing in viscosity and increasing platelet aggregation.

Thus, the activation of platelet hemostasis phenomenon is not accidental, but pathogenetically caused. Activation of platelets at LN NS is less seen than in patients with AGN, NF CGN. This phenomenon is probably due to feature of lupus NS - rare high cholesteremia.

Study AAT depending on the duration of the disease showed the following:in the concurrency of AGN the highest values of AAT areobserved. In patients with NF CGN higher values of IAT correspond shorter duration of disease. When LN NSit is vice versa, with increasing term of the disease growth indicators of AAT is observed. At latent variants of nephritis dependence on duration of the disease is not detected. Therefore, for patients with AGN, NF CGN at the outset of the disease intensified antiplatelet therapy is proved. The need for antiaggregation therapy LN NS increases with age.

Study AAT depending on seasonal variations showed a rising trend of AAT in winter and some reduction AGN, NF CGN and LN NS in autumn. Spring and summer are intermediate. In patients with latent options of GN marked AAT normal values throughout the year. There is a need to strengthen the pathogenetic therapy including AA, throughout the year, especially during the period of maximum activity of platelet haemostasis: winter, spring and summer. In autumn there is a need for a reduction in dose to reduce the incidence of side effects in their long reception.

In the study, there was a tendency to an increase of AAT with the growth activity of LNNS and AVN. The highest values of the induced AT were identified in the IIIrd degree of activity. Consequently, the AAT can be regarded as a measure of the activity of LN. Another confirmation that the AAT reflects pathological process activity is a direct connection AT with finding LE-cells in the blood of patients LNNS, ALN. Such kind of tendency was not revealed at LLN it can be explained with high immunological activity of LNNS, ALN and less suppression of immune processes at LBH.

Pathogenetic therapy GN with suppression of immunological processes indirectly leads to a reduction of aggregation responses.

As a result of antiplatelet therapy was a significant reduction of platelet aggregation when the AA in a comprehensive treatment regimen, due to the addition of antiplatelet and hemodynamic actions of the past to the anti-inflammatory, immunosuppressive properties of corticosteroids (GCS) and cytotoxic drugs.

Analysis of the effectiveness of antiplatelet curantyl dose of 75-150 mg/day (15 patients), sermion at a dose of 30 mg/day (16 patients), trental a dose of 300 mg/day (10 patients) with GN showed a significant decrease AT influenced by curantyl and sermion. The study results allow a reasonable and specifically administering AA. So by increasing the spontaneous aggregation can restrict trental. With a slight increase of the spontaneous and Ca-dependent aggregation, followed by a deterioration of renal hemodynamics, it is advisable to use curantyl. A significant increase in all IAT requires the appointment of sermion.

During dynamic ambulatory monitoring of patients AGN, CGN, LN in terms of 1, 3, 6 months after discharge from the hospital AAT under the influence of corticosteroids remained within the normal range throughout the observation period. At latent cases of GN AAT to discharge after symptomatic therapy and for 6 months in the absence of outpatient treatment remained within normal limits. GCS vast network switching mechanisms mediated leads to a reduction of platelet aggregation.

Research of central and peripheral hemodynamics revealed hypokinetic variant of hemodynamics with increasing TPVR expressed violations of renal blood flow in the absence of changes in the central hemodynamics, a significant decrease in the ERPF and ERBF along with a large increase in PVR in all forms of GN. The lowest values of ERPF and ERBF, high PVR performance were observed in AGN, LN NS. Less seen deterioration in renal hemodynamics noted in cases of latent nephritis. It is known that changes in renal hemodynamics is evaluated as one of nephrology non-immune GN progression mechanisms. Patients NF CGN by correlation analysis established negative relationship AATwith ERPF ($r = - 0,68$, $p < 0,01$) and ERBF ($r = - 0,53$, $p < 0,01$), a positive relationship with PVR ($r = 0,56$, $p < 0,01$) and the ratio of PVR/TPVR ($r = 0,49$, $p < 0,02$). In addition, it sets the PVR strong negative correlation with ERPF and ERBF in all observed groups of patients. Thus, while reducing the ERPF and ERBF, accompanied by the growth of the PVR, set up the conditions that lead to an increase in AA.

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UDC: 618+616.89+615.832.9+615.851.

CLINICAL EVALUATION OF COMPLEX THERAPY PREMENSTRUAL DYSPHORIC DISORDER

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Annotation. The objectives of this study were to compare the efficacy and acceptability of traditional and suggested type of therapy in women with severe premenstrual dysphoric disorder and determine the postmenstrual symptom severity as covariate of the treatment response of 56 patients who met inclusion criteria and reported impaired functioning after three screening cycles were assigned to three cycles of suggested type of treatment.

Suggested treatment was superior to traditional method of therapy, as demonstrated by endpoint analysis of Daily Record of Severity of Problems score.

Аннотация. Ушбу изланишнинг асосий мақсади ҳайз олди дисфорик бузилишлари бўлган аёлларда анъанавий ва тавсия этилган даволаш турини таққослама самарасини ўрганишдир. 56 нафар аёллар уч ҳайз цикл мабойнида ўрганилди. Олинган клиник натижалар тавсия этилган даволаш усулини анаънавий даволаш усулига кўра самарали эканлигини кўрсатди.

Аннотация. Целью данного исследования явилось сравнение эффективности и переносимости, традиционной и предлагаемой видов терапии женщин с предменструальным дисфорическим расстройством. 56 пациенток, соответствовавших критериям включения в исследования после трех скрининговых циклов оценки состояния, были распределены в группы традиционной и предлагаемой терапии для проведения трехмесячного лечения. Согласно результатам анализа ежедневного вопросника выраженности симптомов, предлагаемая терапия оказалась эффективнее традиционной.

Keywords: Premenstrual syndrome, premenstrual dysphoric disorder, diagnostics, treatment.

Калит сўзлар: ҳайз олди синдроми, ҳайз олди дисфорик бузилишлари, диагностика, даволаш.

Ключевые слова: предменструальный синдром, предменструальное дисфорическое расстройство, диагностика, лечение.

Premenstrual dysphoric disorder - a severe form of premenstrual syndrome, which is characterized by various clinical manifestations, including depressed mood, irritability, anxiety, mood swings, poorly controlled feelings of anger, impaired concentration, loss of energy, such physical symptoms as swelling and engorgement.

To date, accumulated a vast amount of information on the effectiveness of serotonin reuptake inhibitors in the treatment of severe premenstrual syndrome (PMS). However, the faster the effect of the appointment of these drugs calls for a full-scale study destination modes and optimal dosages.

Is widespread theory that the development of symptoms triggered by an increase in production of progesterone in the period after ovulation [1]. In this connection, ovulation suppression or surgical medical methods may in some cases be justified step to achieve a therapeutic effect [2]. There are opinions according to which the development of menstrual disorders is a reflection of the failure of important physiological mechanisms for the exchange of trace elements such as calcium, and adequate restoration of the balance can promote regression of neuropsychiatric and physical manifestations of premenstrual disorders. To date, proposed various methods of treatment of premenstrual disorders, with basic methods are considered to be the use of serotonin reuptake inhibitors, and oral contraceptives. However, evaluation of the effectiveness of combined therapy lit state in the literature is extremely insufficient.

The aim of this study was to conduct a clinical evaluation of the efficacy of combination therapy for severe premenstrual disorders to include selective serotonin reuptake inhibitors, oral contraceptives containing drosperinone, calcium and omega-3 polyunsaturated fatty acids.

Material and methods.

In 328 women participated in the study aged between 20 and 35 years old. In selecting patients for inclusion in the study were guided by the following criteria: the presence of regular menstrual cycles lasting 21 to 35 days; presence of clinical manifestations of premenstrual syndrome for at least 6 months; the impact of symptoms on daily activity performed, the absence of mental illness, a satisfactory state of health, in general, the presence of PMS confirmed criteria, according to the drawn two-month prospective evaluation of health with the use of "premenstrual Profile". Exclusion criteria are chosen: mental illness, eating disorders, alcohol abuse, use of psychotropic drugs, taking any medicines to treat PMS symptoms before the study, pregnancy, breast-feeding, a hysterectomy, the clinical manifestations of endometriosis in the form of pain, irregular menstruation, what - or serious physical illness, the risk of suicide.

The diagnosis of severe PMS and premenstrual dysphoric disorder (DDA) previously exhibited on the basis of the analysis of the completed self-assessment questionnaires "Premenstrual profile" (3), i.e. in cases where an overall assessment of symptoms observed during the luteal phase, higher than the estimates during the follicular phase 50% or more. This questionnaire was chosen by researchers as distinguished by simplicity and ease of filling. Further, during a structured interview to the distribution group therapy and further monitoring of the patients used a daily questionnaire of symptoms (Daily Record of Severity of Problems (DRSP)) (4). Establishing a diagnosis of severe PMS / PDR conducted daily interviews in the calculation of total well-being Questionnaire DRSP estimates. The questionnaire consists of all 24 points, reflecting the presence of premenstrual dysphoric disorder, included in the DSM -IV. Twenty-one question helps to assess the severity of psychological and physical symptoms of the DA, the last three are aimed at assessing the functionality of the three domains of the patient: 1) productivity at work, home or school; 2) social activity; 3) the degree of

preservation of interpersonal relations. The severity of each of the questions was evaluated on a 6-point scale: 1 no symptoms, mild symptoms of 4-, 6- most severe manifestations. During the therapy, the patients were asked to fill out questionnaires on a daily basis. To participate in the study for each of the last three points of patients required to obtain at least 2 points.

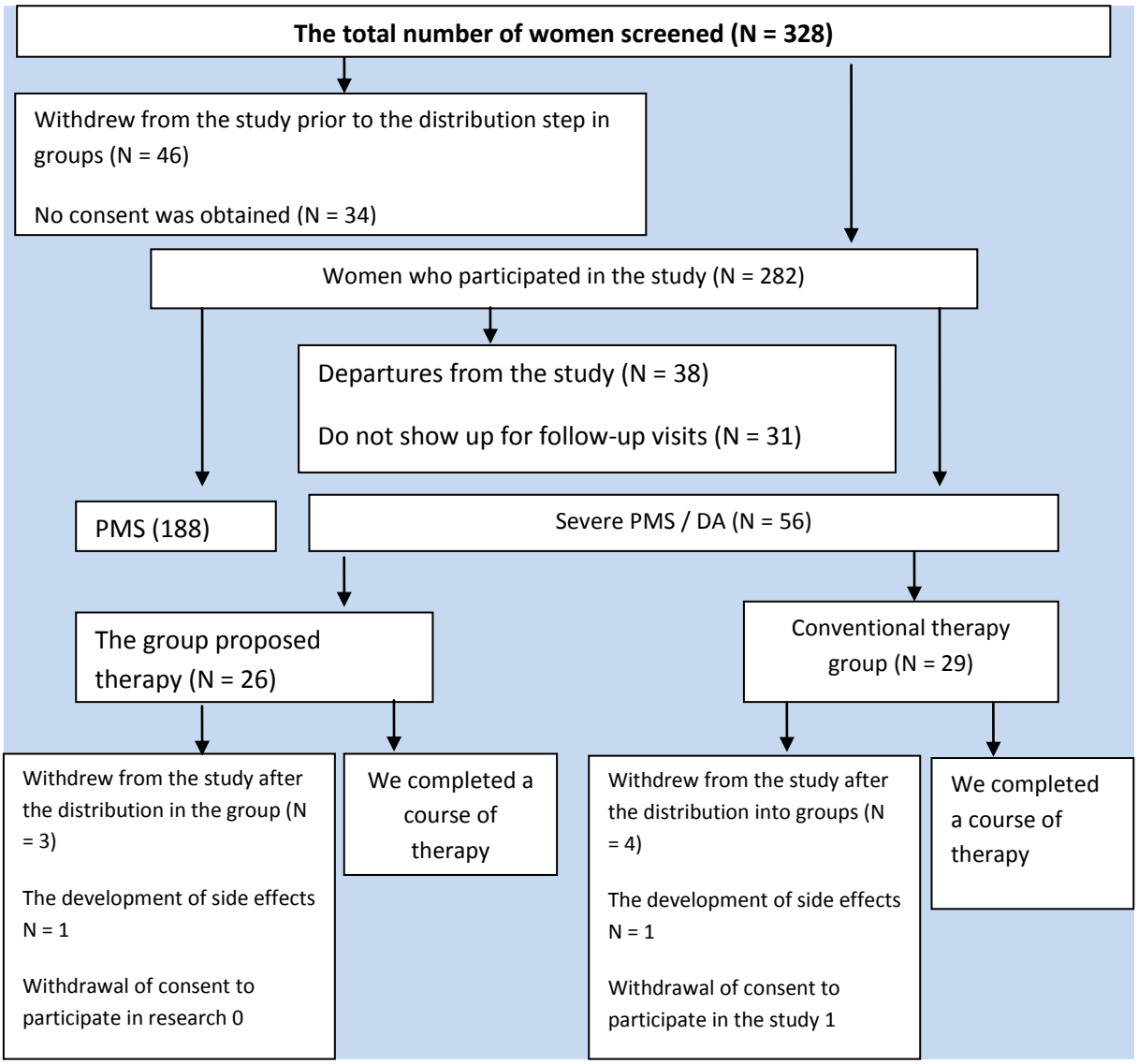
To confirm the diagnosis of severe PMS / DA was necessary to at least 5 symptoms questionnaire rating of DRSP was assigned to a patient 4. In order to assess the state of the aggregate used in the further evaluation, which is calculated by adding the rating assessments for post-menstrual (follicular) days - the first to fifth and menstrual cycle days - six days before menstruation. If necessary, patients were sent to a specialist to rule out mental illness.

After the diagnosis of patients included in the study, we were invited to visit a specialist in the luteal phase of the cycle. During this visit, the expert assessed the general health status, presence and severity of premenstrual symptoms, conduct the necessary Physical and gynecological examination, distributed patients in the treatment group. Laboratory studies included blood chemistry, the profile of thyroid hormones, FSH, complete blood count, blood tests and urine tests. Therapy and dynamic assessment was carried out for three months, follow-up visits to a specialist planned once a month. In total, each of the women participating in the study had to make seven visits to the hospital: the first screening visit, two visits during the filling of "premenstrual Profile" three visits during the prescribed therapy and one visit at the end of treatment. In the study, it was decided that at the admission of prescribed therapy for 6 days and unfilled diaries patient self-assessment considered as having left the study because of the violation of the therapeutic regimen.

All patients participating in the study were divided into an experimental group and conventional therapy.

Traditional treatment of severe premenstrual dysphoric disorder begins with the first day of the menstrual cycle, and consisted in the appointment of an oral contraceptive containing drosperinone (Jess), from the first day of menstruation in a mode 24/4. In the group of proposed therapies for oral contraceptives at the same time added with serotonin reuptake inhibitor (paroxetine) 20 mg per day in the luteal phase (from 13-day cycle), calcium supplements and fish oil to 1 g per day in a continuous mode, the first day of menstruation.

The circuit design of the study.



The basis of the evaluation of the effectiveness of therapy was the dynamics of severity during the luteal phase of therapy cycles. Symptoms were divided into three groups: 1) symptoms associated with negative emotions; 2) The symptoms associated with changes in appetite; 3) The symptoms associated with fluid retention (Table 1).

Table 1.

Ten of the questionnaire items DRSP, in selected clusters for analysis

Symptoms associated with negative emotions
3a. Moodswings 3b. Hypersensitivity to the failure of others to the requests of the patient, quickly advancing sadness or tearfulness 4a. Distinct anger or irritability 4b. Increasedinterpersonalconflicts 5. Reduction of interest in daily activities (eg, work, school, friends, hobbies) Symptoms associated with changes in appetite
8a. Change of appetite, overeating

8b. The specific taste preferences Symptoms associated with fluid retention
7. Apathy, fatigue, a clear decrease in vigor. 11a. Hypersensitivitybreastengorgement. 11b. Breast tenderness, headaches, little swelling, increased body mass.

Statistical analysis of the results was performed using Epi Info Version 3.5.3 software (http://wwwn.cdc.gov/epiinfo/)

Results and its discussion

Of the 328 women, passed initial screening, 46 were eliminated at the stage prior to distribution groups. Of these, 34 did not give consent to participate in the study, 12 did not meet the inclusion criteria. It does not appear for follow-up visits 31 women. In 3 patients identified medical problems that prevented further continuation of participation. Spontaneous improvement reported in 4 women. 244 women have different shapes premenstrual syndrome have been identified. The focuses of this study were 56 patients who had the criteria for premenstrual dysphoric disorder / severe form of premenstrual syndrome.

A typical patient - a participant of the study had the following demographic characteristics: higher education (35.4%) or incomplete higher education (54.2%), housewife (25.0%), or attending school (68.8%), married (85, 4%) and having one or two children (83.3%). (table 2)

Table 2.

The main socio-demographic characteristics of the study sample.

Variable	The group proposed therapy (N = 23)	Conventionaltherapygroup (N = 25)
Age	26,5±6,5	28±7
Agerange	20-33	21-35
Familystatus (%)		
Single	13,0	12,0
Married	87,0	84,0
Divorced	0,0	4,0
Education (%)		
Higher	34,8	36,0
Incompletehigher	52,2	56,0
Specializedsecondary	8,7	4,0
Average	4,3	4,0
Professionalemployment (%)		
A working	4,3	8,0
A housewife	26,1	24,0
Student / student	69,6	68,0
FullTermPregnancyhistory (%)	82,6	84,0

Postpartumdepressioninhistory (%)	13,0	12,0
The presence of a deep depression in history (%)	4,3	4,0
The presence of PMS in the immediate family (%)	56,5	56,0
The use of oral contraceptives in history (%)	26,1	24,0
The duration of the PMD mean ±. off)	5,4±2,5	5,9±3,1
Range	2,9-7,9	2,8-9

During the screening conversation revealed that 37 (77%) of participants noted a decrease of efficiency in the days before menstruation for at least the last month. Large number of women mentioned the use of oral contraceptives in history (25%).

Reducing mood postpartum medical history indicated 12.5% of the participants. At the time of inclusion in the study the mean scores of health, according to the questionnaire Daily Record of Severity of Problems, amounted to 158 and 145 in the group proposed and conventional therapy, respectively (Table3).

Table 3.

Baseline clinical characteristics of the patients at the time of enrollment

Characteristics	The group proposed therapy (N = 23)		Conventionaltherapygroup (N = 25)	
	Average	Statisticaldeviation(SD)	Average	Statisticaldeviation. (SD)
Average ratings of health (on the questionnaire DRSP) to the beginning of the study				
Thedaysbeforemenstruation	158	59	145	52
Daysaftermenstruation	31	24	33	26
Functionalassessment				
Familylife	2,7	0,8	2,8	0,9
Job	2,4	0,9	2,4	0,9
SocialActivity	2,2	0,7	2,3	0,8
Sexualactivity	2,3	1,1	2,1	1,1

The manifestation of the side effects of drugs was observed in 7 patients. In general, the side effects were insignificant and disappear spontaneously with continued therapy. Among all the possible side effects range prescribed drugs account nausea, feeling of dry mouth, insomnia. Three women intensity of undesirable effects of therapy has been expressed so that was an obstacle to the continuation of the study. In the group of conventional therapy of the patients noted the development of excessive nausea and expressed migraine headaches,

which was the reason for the termination of further participation in the study. In the experimental group, one of the women pointed out the development of skin rashes and itching, whereby the further administration of drugs was discontinued.

Of the 56 patients in the group allocated to the final study treatment continued only 48 (25 - a conventional therapy group and 23 - in the proposed group). The reason was the drop-out: withdrawal of consent to participate in issledovanii- 1, violation of the prescribed regimen terapii- 2, failure to appear on the control vizity- 2. Dynamic monitoring and assessment of patients within three treatment cycles in both groups showed a reduction in symptom scores from baseline (Table 4).

Table 4.

Dynamic observation and assessment of the state of patients for three cycles of therapy (group therapy offered)

Groupofsymptoms		Initialdata (N = 26)	cycle №1 (n=23)	cycle №2 (n=23)	cycle №3 (n=23)
Symptoms associated with negative emotions	Theaverage statisticald eviation	24,3±4,5	11,8±5,4	8,5±5,1	7,8±5,2
	Median	24,1 (10,1-29,0)	8,7 (5,6-28,7)	7,6 (4,2-28,7)	7,5 (4,5-28,7)
Symptoms associated with changes in appetite	Theaverage statisticald eviation	9,4±2,4	3,8±1,8	3,6±1,7	3,3±1,6
	Median	9,4 (3,5-11,5)	3,4 (3,2-11,5)	3,2 (2,0-10,8)	3,1 (2,0-10,0)
Symptoms associated with fluid retention	Theaverage statisticald eviation	12,9±2,9	6,8±2,2	5,2±1,9	4,5±1,4
	Median	12,9 (4,1-17,6)	6,4 (3,2-17,5)	4,8 (3,0-16,2)	4,0 (2,3-16,2)

Dynamic monitoring and evaluation of the state of patients for three cycles of therapy (group of traditional therapy)

Groupofsymptoms		Initialdata (n=29)	cycle №1 (n=25)	cycle №2 (n=25)	cycle №3 (n=25)
Symptoms associated with negative emotions	Theaverage statisticald eviation	23,8±4,2	15,2±5,6	15,1±6,1	14,7±6,7
	Median	21,8 (7,6-29,7)	14,5 (7,6-28,7)	14,6 (7,6-27,7)	13,9 (7,8-27,7)

Symptoms associated with changes in appetite	Theaverage statisticald eviation	9,2±2,6	4,5±1,1	4,2±1,5	4,1±1,2
	Median	8,9 (2,5-11,5)	4,2 (2,5-11,5)	3,9 (2,5-11,5)	3,8 (2,5-11,5)
Symptoms associated with fluid retention	Theaverage statisticald eviation	12,8±3,1	7,1±2,4	6,8±1,8	6,2±2,1
	Median	12,1 (5,3-17,8)	5,9 (2,8-17,8)	6,3 (3,2-17,8)	5,4 (3,3-17,8)

The mean percentage reduction estimates for each group of symptoms was larger in the proposed therapy group. When comparing groups greatest effect in reducing the symptoms observed among patients estimates experimental group after the first month of treatment.

The trend towards improvement being observed in both groups and in the future, for 2 and 3 months of therapy, but was slightly higher efficiency of the proposed therapy. Analysis of the effectiveness of both types of treatment carried out, taking into account groups of symptoms, it showed that the most significant results in reducing health assessments have been made in the experimental group in terms of improved emotional state and reduce the severity of symptoms of fluid retention. The proposed treatment group patients increasingly marked improvement in family relationships, interpersonal communication, increase the level and quality of social activity.

All patients discontinuing therapy proposed taking the drug for at least a month, although it is all women noted improvement of health, manifested mainly in the form of reduced emotional stress and improve mood.

Response to therapy against symptoms disappear after menstruation was also more important in the proposed therapy group, however, despite the fact that the improvement noted as women with initially symptomatic and those whose symptoms were minor, clinically significant efficacy therapy has achieved only among the latter category of patients. Women had higher scores of symptoms in the postmenstrual period marked improvement, however, the level of symptoms still remained high. The clinical response to therapy, according to the percentage reduction of health assessments, was 69.6% (16 people) in the proposed therapy and 52% (13 people) in the group of conventional treatment. Reducing the average premenstrual symptoms by 75% was observed in 26% of women in the proposed therapy group. Violation of indicators common laboratory tests in both groups of patients were observed.

By definition, the PRD is a condition that can seriously reduce the quality of life and disrupt your normal daily rhythm of suffering from this disease woman affect relationships with family members of patients, colleagues, peers at school.
Effect of DA on family relationships and parenting is compared with the violations found in patients with major depression (5,6). Surveys devoted to the study of severe PMS / DA, show that 3 to 16% of women can not comply with the relevant

duties at work as a result of developing the clinical manifestations of the disease. (7).

In a recent study on a global scale, aimed at clarifying the impact of PMS / DA symptoms on the daily activity of women, it has been proven that most affected the scope of the relationship between the spouses, family members, reduced working capacity (8.9).

The results of our study show that the study participants also had higher baseline assessment of the intensity of the clinical manifestations observed noticeable mood swings, feeling a sharp decline in the possibility of establishing interpersonal relationships.

Some of the performance of individual components of the proposed therapy proven in much serious scientific research. Thus, the data obtained during the double-blind, placebo-controlled randomized trials and meta-analyzes indicate steady improvement of health of women taking selective serotonin reuptake inhibitors in the luteal phase of the cycle.

The results of this work show that the inclusion of this class of drugs in the complex of the proposed treatment and the limitation receiving serotonin reuptake inhibitors, a luteal phase of the cycle has led to a decrease in the probability of side effects while maintaining a stable positive dynamic in response to therapy. In addition, the observed positive effects in the appointment of paroxetine in relatively low doses can serve as proof of the involvement of serotonin in the pathophysiology of premenstrual symptoms, as well as point out the existing differences in the mechanisms of development of premenstrual syndrome and premenstrual dysphoric disorder. Existing theories explain this difference in the presence of dynamic emerging vulnerability to fluctuations in hormones caused by genetic and environmental factors, as well as interactions between the fluctuations of hormones and neurotransmitters.

The growing interest in omega-3 polyunsaturated fatty acids in the treatment of various types of mood disorders, including bipolar disorder, appeared after the publication of the results of the well-known placebo-controlled study (10).
It provided evidence that the omega-3 fatty acids may modulate the metabolism of neurotransmitters and their expected ability to inhibit neuronal signal transduction type drugs lithium and valproate. (eleven). In addition, well-known proof of the effectiveness of nutritional support omega-3 polyunsaturated fatty acids in the treatment of severe types of disease as severe depression and schizophrenia, borderline personality disorder (12-15).

From this perspective seems warranted inclusion in the complex therapy of fish zhira- main natural source of omega-3 polyunsaturated fatty acids.

A number of studies have shown the existence of an association between the cyclical changes in calcium metabolism and mood instability in women with premenstrual disorders during the menstrual cycle (16). Also, some authors have shown a link between a decrease in the function of the parathyroid glands, hypocalcaemia in the development of depression. (17). The results obtained in the course of the study results support the hypothesis put forward in the literature

about the importance and the need to support women with premenstrual disorders of calcium to reduce the intensity of the clinical symptoms (18).

However, to obtain full evidence should undertake a study of changes in kaltsemii groups of women involved in the study.

This work, together with the results of studies published by other authors (19-21), confirms the presence of periodicity and the cyclical nature of the pathology for which therapy can show their effectiveness if held in a certain period of the menstrual cycle and is justified from the standpoint of existing and studied pathogenic mechanisms. (22,23)

Results of the study demonstrate that the approach to the treatment of severe PMS / DA using a complex etiopathogenic means to achieve a significant reduction in the clinical manifestations of this disease. According, to the analysis of this work offers a comprehensive treatment of premenstrual dysphoric disorder to include selective serotonin reuptake inhibitors, oral contraceptives containing drosperinone, calcium and omega-3 polyunsaturated fatty acids was more efficient than traditional.

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UDC:577.25

SOME ASPECT MECHANISM OF INFLUENCE OF ELECTROMAGNETIC FIELDS ON LIVING ORGANISMS

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Abstract. In this article complexities of research of influence of electromagnetic fields (EMF) of low-frequency and high-frequency ranges on biological objects are considered. Attempt has been undertaken to estimate influence of EMF on biological objects and to assume the possible mechanism of their action. Under action of variables of EMF in tissues of the test-objects there are processes of two basic types fluctuations of free charges and turns of dipole molecules according to the frequency of EMF.

Аннотация. Ушбу мақолада билогик объектларга паст частотали ва юқори частотали электромагнит майдонларни тадқиқ этиш мураккаблиги баён қилинган.

Аннотация. В данной статье рассмотрены сложности исследования влияния электромагнитных полей (ЭМП) низкочастотного и высокочастотного диапазонов на биологические объекты. Предпринята попытка оценить влияние ЭМП на биологические объекты и предположить возможный механизм их действия. Под действием переменных ЭМП в тканях тест-объектов происходят процессы двух основных типов колебания свободных зарядов и повороты дипольных молекул в соответствии с частотой ЭМП.

Keywords: electromagnetic field, the frequency of electromagnetic field, free charges, the biological test-objects.

Калит сўзлар: электромагнит майдон, электромагнит майдон частотаси, эркин зарядлар, биологик тест-объектлар.

Ключевые слова: электромагнитное поле, частота электромагнитного поля, свободные заряды, биологические тест-объекты.

Introduction

The influence of electromagnetic fields (EMF) on the living organisms require coordinated interaction of physicists, biologists and physicians.

Primary task of biologists and physicians is to provide an efficient and reliable method for determining the EMF effects on living organisms. Problematic is the identification of a reliable assessment of changes in the physiological state and the vital functions of biological objects exposed to electromagnetic radiation. You need the right choice of model objects, suitable for solving these problems.

For a more complete understanding of the EMF effects on the body is necessary to use modeling techniques. We must remember that the body's response to its different levels can be different. Trying to understand the impact of factors at the molecular or even atomic level, we should not forget that the effects do not

necessarily determine the reaction of the whole organism. It is known that the system is more complex level of organization - it is not just a set of simpler systems, it has new features, it is not inherent in the constituent parts. That is why it becomes difficult correlation effects arising at different levels of the organism, and the search for their relationship.

For the most complete explanation of the effect of EMF on the object you need to study first integrated reaction of the organism, its hierarchical systems of varying degrees of complexity, as well as the determination of physiological and biophysical changes in tissues and organs. The second stage of the study of the mechanism of the effect of EMF - this simulation. With enough data about the physiological reactions of the body and having knowledge of the physical and chemical mechanisms associated with the study of the biological reaction of the object to an external stimulus, it is possible to bring the study of the mechanism and to consider appropriate processes at the molecular level.

Effect of EMF on the body depends on many factors: the EMF type, its characteristics and properties of the medium on which it acts.

Used in low-frequency EMF 5Hz (industrial frequency.) – fielddecamegametric wave length range of 10^{7}-10^{8} m The sources of low frequencies are especially all systems of production, transmission and distribution of electricity (power lines - transformer substations, power plants, electrical systems, various cable systems); home and office electrical and electronic equipment, etc., transportation to the drive: w / d transport and its infrastructure, the city - metro, trolley, tram.

High-frequency EMF at 27 GHz - the radio waves of ultrahigh frequencies (UHF) band waves - microwaves centimeter length 10^{-1}-10^{-2}m. This radiation is used for medical therapeutic and diagnostic facilities, home appliances (microwave oven), display means information for CRT (personal computer monitors, television, etc.) [1].

In the range of low to ultrahigh frequencies in the vicinity of the EMF generators should be considered as the induction field instead of radio waves as a stream. induction fields quickly attenuated with distance from the source and outside the neighborhood radius of several wavelengths of EMF intensity is already a small fraction of its initial value.

Study EMF effects on the organisms in the induction zone, showed that the induction zone *E* (electric field intensity) and *H* (magnetic field strength) do not vary in phase and decreases rapidly when the distance from the source (inversely proportional to the square and cube, respectively), and the ratio between the average values of them can be any. The induction area of energy passes alternately in the electric, the magnetic field, so we evaluated separately *E* and *H*.

The generators are designed harmonic electromagnetic oscillations (sinusoidal electromagnetic waves). High-frequency EMF characterized by the following values: *E*=200 *V/m*, *H*=6,5 *A/m*, *B*=5200 *nT*; low frequency EMF: *E*=90 *V/m*, *H*=1,9 *A/m*, *B*=1500 *nT*.

In order to attach the EMF energy of a physical object with the maximum linear dimension *l*, there are two ways (depending on the ratio *l*/λ, where λ-wavelength) can either move the object as the load element lumped capacitance or inductance in the oscillator circuit EMF, or affect the object with electromagnetic waves.

In the experiment, quasi-stationary condition $l<<\lambda$ was performed for all organisms, where the impact on the objects can be estimated from the DC laws. Consider this as an example of semi-conductive cylinder forming *l*, the greater the radius *R*, et circular cross-section area *S*.

Suppose that an object placed in an electric field between the capacitor plates so that the ends of the cylinder and parallel plates are equidistant from them. Then, the induced current in it will be expressed as follows [2]:

$$I = \frac{V_{cyl}}{Z}, \tag{1}$$

whereV_{cyl} - thevoltage drop between the ends of the cylinder; $Z = \frac{l}{S(\sigma - j\omega\varepsilon'\varepsilon_0)}$ - its impedance.

The voltage drop on the cylinder is only a fraction of the voltage V0 applied to the capacitor plates:

$$V_{cyl} = V_0 - \frac{2d}{S\omega\varepsilon_0} I, \tag{2}$$

where *d* - the distance from the end of the cylinder to the condenser plate.

According to the literature, EMF effects on living organisms is a comprehensive complex, but the main impact is still associated with the properties of cells and tissues [3].

Tissues of living organisms in their electric and magnetic properties are electrolyte solutions containing protein molecules with weak diamagnetic or paramagnetic properties and electrical polarity characterized by a dipole moment.

Under the influence of the electrostatic fields in such environments move "free" electrical charges (electrons, ions and other charged particles), there is polarization, i.e. offset "bound" charges (electrons in the atoms, the atoms in the molecules), the molecular orientation occurs and possessing a permanent dipole moment (protein molecules and water molecules). Magneto static field causes the orientation of diamagnetic and paramagnetic molecules, and on the moving electric charges, it operates with the power defined by the equation [3]:

$$F = qvH, \tag{3}$$

where *q* - the quantity of electric charge; *v* - the speed of movement; *H* - magnetic field strength.

Under the influence of variables EMF processes in two basic types will occur in the medium: vibrations and rotations of free charges of dipole molecules in accordance with the frequency of the EMF change. As the medium has an electrical resistance and toughness, both of these processes are associated with loss

of EMF energy in the first case they are called conduction losses in the second - dielectric losses.

The magnitude of the losses, or other type and their share in the total absorbed energy in the medium EMF depend, firstly, on its electrical parameters – the electrical conductivity and permittivity, and, secondly, by influencing the frequency of the EMF.

The ratio between the conductivity and dielectric losses are usually expressed either loss tangent of loss angle $tg\delta$ or complex permittivity ε^*. These valuesare linked by the following relations [4]:

$$tg\delta = \frac{\varepsilon''}{\varepsilon'} = \frac{\delta}{\omega\varepsilon'\varepsilon_0}; \quad (4)$$

$$\varepsilon^* = (\varepsilon' - j\varepsilon'')\varepsilon_0,$$

where ε'' - the loss factor (or loss factor); σ - conductance, which takes into account both types of losses.

The medium is considered as conductive, conduction loss if it significantly exceeds the dielectric, i.e. when $tg>>1$; a semi-conductive when both types of losses are approximately equal, that is $tg\approx 1$; as a dielectric when the dielectric loss greatly exceeds the conduction losses, i.e.$tg<< 1$.

As can be seen from equation (4), the value of $tg\delta$ frequency dependent, therefore, the same fluid may behave as a conductive with respect to EMF one frequency range exhibit properties of semiconducting when EMF another band and finally the dielectric properties relative to the EMF the third frequency band. This fact should be taken into account when assessing the effects of electromagnetic waves on living tissues.

The power dissipated in the dielectric medium per unit volume, depends also on the frequency as seen from the expression

$$P_D = \omega\varepsilon'\varepsilon_0 tg\delta E^2. \quad (5)$$

Besides, the value of ε^* EMF varies with frequency (dispersion) since any polarization associated with transient relaxation processes. This means that the charge and discharge processes occur not instantaneously, but after some finite time - the relaxation time τ, depending on the structure of polarizing elements, viscosity of the medium and its temperature. Arising in connection with the frequency dependence of ε^* is expressed as follows [5]:

$$\varepsilon' = \varepsilon'_\infty + \frac{\varepsilon'_S - \varepsilon'_\infty}{1+(\omega\tau)^2}; \quad \varepsilon'' = \frac{(\varepsilon'_S - \varepsilon'_\infty)}{1+(\omega\tau)^2};$$

$$\sigma = \sigma_S \frac{(\sigma_\infty - \sigma_S)(\omega\tau)^2}{1+(\omega\tau)^2}, \quad (6)$$

where s is the index characterizes the values at a very low frequency, and the index ∞ - at very high frequencies.

These equations describe the three types of relaxation processes.

The first type - the relaxation of molecules with a permanent dipole moment, when the equation (6) is called the Debye equations and τ is determined by the viscosity of the medium η, and the radius of the molecule$a$ and the absolute temperature T:

$$\tau = \frac{4\pi a^3 \eta}{kT}, \tag{7}$$

where k - is Boltzmann's constant.

The second type of relaxation characteristic of the heterogeneous structure - suspension of spherical particles with a dielectric constant ε'_i and conductivityσ_i, holding in solution (ε'_a and σ_a) share of volume equal to p. In this case, the equation (6) is called the Maxwell's equations - Wagner at the following parameters:

$$\tau = \varepsilon_0 \frac{\varepsilon'_j + 2\varepsilon'_a}{\sigma_i + 2\sigma_a}; \; \varepsilon_S - \varepsilon_\infty = \frac{\left(\varepsilon'_i \sigma_a - \varepsilon'_a \sigma_i\right)^2}{\left(\varepsilon'_i - 2\sigma_a\right)\left(\sigma_i + 2\sigma_a\right)^2}. \tag{8}$$

The third type - relaxation associated with polarization at the interfaces in the presence of an environment containing ions of different size particles with surface electric charges. This case corresponds to have a number of equations of the type (7) for different values of τ.

The maximum dielectric loss occurs when the EMF frequency coincides with the characteristic relaxation frequency $\omega_x = 1/\tau$.

Tissues of living organisms on the electrical properties can be divided into three groups according to their content of water: The suspension of cells and protein molecules of liquid consistency (blood, lymph); similar suspension located in a compressed state (muscle, skin, liver, etc.); tissue with a low water content (fat, bone). Cells, colloidal particles, and other protein molecules micro particles being suspended in an electrolyte solution, the dipole moment of purchase. The electric charges in the tissues are also presented water dipole molecules, and finally, the electrolyte ions.

In a constant electric field in the tissue to some extent polarized - charged particles move along the field lines, dipole molecules are oriented in the same direction. In an experiment conducted by EMF constant voltage was applied directly to the skin of the body. It is assumed that in this tissue under the influence of an electric current EMF associated with ionic conductivity. Figure 1 shows the equivalent diagram of the cell to the extracellular environment.

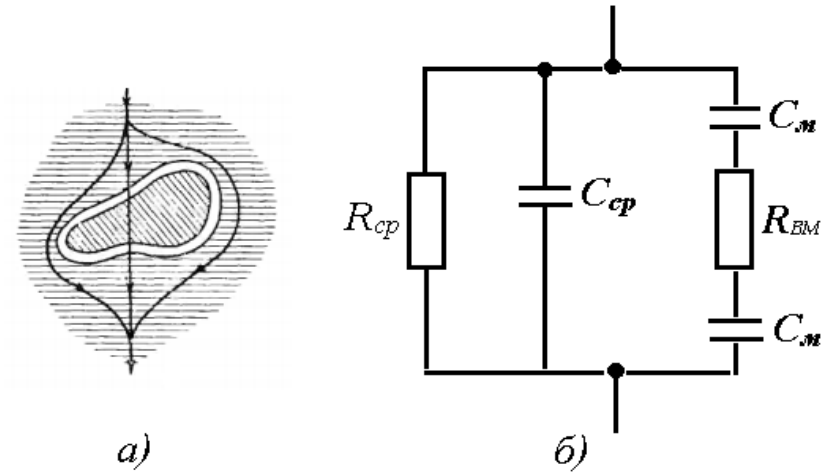

Fig.1. Passage of electrical current in the cell (*a*) and the equivalent circuit diagram (*b*): R_{cp} - resistance; C_{cp} - the capacity of the extracellular medium; R_{BM} - resistance to the intracellular environment; C_M - the capacity of the cell membrane [4].

Obviously, if a constant voltage membrane behaves as an insulator, and a current can flow only in the extracellular medium. Under the influence of the DC voltage can occur and the phenomenon of electrophoresis - the transfer of electrically charged particles (cells, macromolecules).

In these areas of EMF (low and ultra-high frequency) observed changes in ε' and σ (or ρ = 1/σ) tissues, depending on the frequency. Two dispersion range noted: α-dispersion at low frequencies (5Hz) range and γ-dispersion at high frequencies (27 GHz).

At the figure 2 is a graph of stroke dispersions muscle (humans and other mammals), which is marked as β-dispersion range registered in a radio frequency.

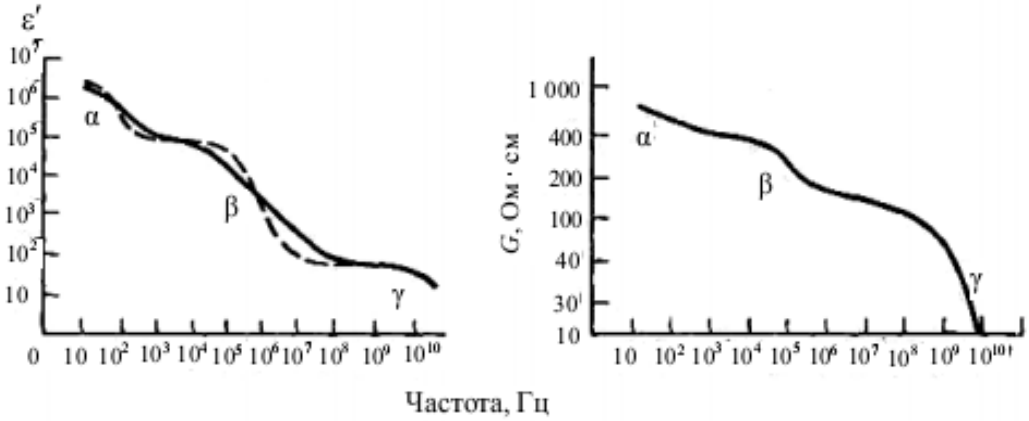

Fig.2. The dependence of the dielectric constant (*a*) and the resistivity (*b*) of muscle tissue on the frequency. Dotted - theoretical curve [6].

Regarding the mechanism of α-dispersion expressed some assumptions [6]. Since low frequency can only ionic conductivity, and the cell membranes behave as insulating layers, the low-frequency currents can flow only in the extracellular medium, which leads to low conductivity of tissue. Adipose tissue per se have a low conductivity, and content of the electrolyte is very small. Increase σ with increasing frequency can be attributed to a corresponding decrease in the capacitance of the cell membrane, leading to ever-increasing participation of the intracellular environment in general tissue conductivity.

Very high values of ε'at low frequencies and a sharp drop of this magnitude with increasing frequency associated with the relaxation of the charge and discharge processes on the cell membrane or to the relaxation caused by air ions, electrically charged surface of the surrounding cells. Frequencies still so low that the time to recharge your cell membranes (due to ions inside and outside the cells) for one period. Consequently, the total charge for the period of large capacity and significant tissue. This is equivalent to high dielectric permittivity tissue (capacity per unit volume).

Character γ-dispersion at frequencies above 1 GHz satisfactorily explained polar properties of water molecules. The dispersion curves are in good agreement with the Debye equations (6), if the expression for ε''enter the record, taking into account the ionic conductivity [7]:

$$\varepsilon'' = \frac{\varepsilon'_S - \varepsilon'_\infty}{1 + (\omega\tau)}\omega\tau + 1{,}3 \cdot 10^{13}\frac{\sigma}{\omega\varepsilon}, \quad (9)$$

where τ - relaxation time of water molecules (of the order of 10^{-11} s); σ - ion conductivity, which is independent of frequency.

The nature of the variance is due to the fatty tissues of their structure. It was established that a pure fatty tissue parameters are practically independent of the frequency range above 100 MHz, whereas the tissues consisting of adipose cells surrounded by an electrolytic medium, the dispersion is observed at [7]. For bone dispersion satisfies the Debye relaxation time at 0,7-10^{-11}swith and adjusted to the ionic conductivity.

In this way, the EMF effects on the body depends on many factors: the type and EMI characteristics and properties of the medium on which it acts. The main mechanism of EMF exposure in the living object is to change the properties of aqueous body fluids. The main targets under the influence of EMF on biological objects are: the plasma membrane of cells, intra- and intercellular fluid. Electromagnetic waves may increase the hydration of protein molecules. The electromagnetic field is strongly absorbed by water and aqueous solutions. All of this confirms the need for particular scrutiny EMF influence is on water bodies. Use objects of different levels of organization (arthropods, amphibians, fish) allows you to more fully consider the characteristics of EMF effects on living organisms.

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UDC: 16.15+615.38+616.8+616-053.2+616-092

THE STUDY OF GENETIC POLYMOPHISMS WITH THROMBOCYTOPENIA

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Annotation. It is known that in the genesis of thrombocytopenia important role identify genetic factors. Significant advances in the study of genetic polymorphisms for thrombocytopenia reveal many unknown aspects of the mechanism of the disease. However, most of these studies are conflicting data.This requires further research to study the role of genetic polymorphisms for thrombocytopenia.

Аннотация. Маълумки, тромбоцитопениянинг генезида генетик омиллар муҳим аҳамиятга эга. Тромбоцитопенияда генетик полиморфизмларнинг анча муваффакиятли ўрганилиши касалликнинг ривожланиш механизмининг кўп ноаниқ томонларини очиб бермоқда. Аммо, бу изланишларнинг кўпчилиги карама карши маълумотларга эга. Бу эса ўз навбатида тромбоцитопенияда генетик полиморфизмларнинг аҳамиятини кейинги тадкикотларда чукур ўрганишларни талаб қилмокда.

Аннотация. Известно, что в генезе тромбоцитопении немаловажную роль определяют генетические факторы. Значительные успехи в изучении генетических полиморфизмов при тромбоцитопении раскрывают многие неизвестные стороны механизма развития заболевания. Однако, большинство этих исследований имеют противоречивые данные. Это требует проведение дальнейших исследований по изучению роли генетических полиморфизмов при тромбоцитопении.

Ключевые слова: геморрагические диатезы, тромбоцитопении, диагностика, гены, полиморфизм.

Keywords: hemorrhagic diathesis, thrombocytopenia, diagnostics, gene, polymorphism.

Калит сузлар: геморрагик диатезлар, тромбоцитопениялар, диагностика, генлар, полиморфизм.

Introduction

Thrombocytopenia is a widespread disease among a group of hemorrhagic diathesis, manifested hemorrhagic syndrome microcirculatory type caused by a decrease in the number of platelets in the blood of the patient, in the absence of any other significant changes in the quantitative and qualitative composition of blood. The disease is considered to be the most common immune Blood Disorders, with a frequency of about 16-32 cases per million populations per year {1}. However, seeming external "lightness" of the disease and the relative rarity of fatal bleeding, it leads to significant psychological and social status of the patient with decreased quality of life, up to a level comparable to that in patients with arthritis and diabetes. In addition, at the risk of ITP life-threatening bleeding is quite high and amounts to 5.0%, and total mortality risk relative to the population in general, and is determined at a low rate (1.3), but it can be as high as 4.2 at the platelet duration of the observed level of at least 30 x 10 9 / l within two years after diagnosis verification {1} .

It is known that the disease may have both primary and secondary genesis and associated with various factors. Prevalence, medical and social significance of the disease, the study questions the mechanisms of its development occupy the first place.

All the more urgent in recent years in the study of pathogenetic aspects of the development of many diseases becomes the study of genetic factors. Today, in modern literature data known as thrombocytopenia with an important role in the genesis of the disease and determine the genetic polymorphisms of different genes. At the same time, the data for the study of genetic aspects in thrombocytopenia numerically small, and existing data are often contradictory {1,2}.

According to some authors, in the development of thrombocytopenia, a role played by genetic predisposition quality is defective platelet-transmitted in an autosomal dominant type {2}.

Foreign scientists studied different genetic polymorphisms with thrombocytopenia, determining a role in the genesis of the disease {3,4,7}.

It is known that an important role in the development of certain autoimmune diseases, inflammatory cytokines play, namely interleukin IL-17 F. In this connection, Saitoh T. Tsukamoto N. Koiso H. patients with immune thrombocytopenia conducted a study on gene polymorphism of interleukin-17 F. The researchers examined the association between chronic ITP and frequency of single nucleotide polymorphism rs 763 780 (7488T / C) IL-17F gene in 115 patients (50 were male and 65 females, mean age 43 years) with a diagnosis of chronic ITP and 190 healthy people (80 were male, 110 females, average age, 38 years). Po compared with the control group, patients with chronic ITP revealed a significantly lower frequency of genotype 7488 CC IL-17F (0% vs. 4,8%, p <0, 05). The frequency of alleles 7488S IL-17F in patients with chronic ITP was also significantly lower in comparison with the control group (15.2% vs 8.7%, OR = 0.48, 95% CI = 0,27-0,84, p = 0.016). Moreover, in patients with genotype presence 7488TT IL-17F marked by rather low levels of platelets in comparison

with native genotype 7488TC genotype IL-17F (20,9% vs. 0%; p = 0.04). In conclusion, the researchers concluded that the presence of allele 7488TT in the gene IL-17F ITP {7}.

Scientists Wu K.H, Peng C.T., Wan L. (2007) studied the polymorphism of interleukin IL-1 beta exon 5 and IL-1 receptors in 30 Chinese children with chronic thrombocytopenia and 50 children with acute thrombocytopenia resulting revealed that polymorphism IL-1 receptor is associated with the development of the disease {3}

Rocha A.M., De Souza C., Rocha G.A. et al. (2010) on the basis of their research conducted in 122 patients with thrombocytopenia, concluded that elevated levels of IL 1 and IL2-330G RN play a role in the pathogenesis of thrombocytopenia {7}.

Breunis W.B., Van Mirre E., Bruin M. et al. (2008) and He L. Y., Zhao M.B. et al. (2009) in their isslevaniyah revealed that patients with thrombocytopenia FCGR2C gene activates retseptoy of IgG that has antibodycreative cellular cytotoxicity by immune cells, so it may be a genetic risk factor predisposing the development of thrombocytopenia {4}.

Egyptian researchers Cairo University Anis S.K, Abdel Ghany E.A. Mostafa N.O., Ali A.A., (2011), studying the gene polymorphism PTPN 22 in 50 children with thrombocytopenia, found a high frequency of nucleotide polymorphism 1858S> T in the studied gene, as a result of which came to the conclusion that this can be regarded as a genetic risk factor in the development of thrombocytopenia in Egypt children {3}.

Chinese scientists Zhao H., Du W., Gu D. Et al. (2009), studying the role of promoter polymorphism DNMT3B 579> T in patients with thrombocytopenia Chinese population revealed no significant differences in the distribution of genotypes and alleles between patients and controls {4}.

German (2007) {7}, China (2010), {1} and Egypt (2011) {2} studies are facts. With B-cell activating factor (BAFF) is an important pathogenic factor in the development of thrombocytopenia developing conducted in 53 patients with thrombocytopenia, which showed improvement in the polymorphic site of the promoter (-871) BAFF in comparison with the control group.

In many foreign sources are conflicting reports on the role of tumor necrosis factor in the pathogenesis thrombocytopenia. So, Cambridge university for scientists have studied 206 patients with thrombocytopenia, revealed a high frequency (95%) TNF polymorphism TNFA-308g> a {4}. Japanese scientists in their research on the study of polymorphism of TNF-beta (+ 252G / A) y 84 Japanese patients vyvili high frequency of the gene polymorphism. Turkish scientists {3} studied gene polymorphisms TNF-alfa, TGF-beta 1, IL-10, IL-6. IFN-gamma, MBL. GPIA and IL-1A in 71 patients with IT. V result of the research they have found a high level of expression of TNF-alfa (-308) phenotype AG, decrease genotype TT TGF-beta 1, high levels of genotype BB MBL, genotype A1 / A2 IL- 1 in patients with RA iT, allowing them to identify genes that predispose to the disease. Whereas Atabay B., Oren H., Irken G., Et al. (2003)

studied the polymorphism of transforming growth factor beta 1 (TGF-beta1) y 40 children with IPT showed no significant differences with the control group, indicating that the polymorphism of this gene may not be a genetic risk factor in thrombocytopenia developing {4}.

Japanese scientists Nomura S., Matsuzaki T., Ozaki Y. Et al. (1998) on the basis of their research note in 111 Japanese patients with thrombocytopenia high frequency polymorphism HLA-DRB1 * 04, which shows the impact of these genetically determined factors on the development of thrombocytopenia. These data were confirmed in studies Negi R.R. Bhoria P., Pahuja A et al. (2012) {3,5}.
In turn, Negi R.R. Bhoria P., Pahuja A et al. (2012) in their studies on the basis of the DRB1 genotyping HLA alleles detected no association between HLA antigens and thrombocytopenia among the Indian population {5}.

By analyzing the above data, it can be concluded that advances in the study of genetic polymorphism with thrombocytopenia reveal its many unknown aspects. However, most of these studies are contradictory data. In this regard, the obvious need for further study researches in order to remove this contradiction, and improving diagnostic methods of monitoring and forecasting of thrombocytopenia.

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UDC: 37.052. +37.09. C

PERIODIZATION PROBLEMS, STAGES OF FORMATION AND DEVELOPMENT THE EDUCATIONAL SYSTEM OF UZBEKISTAN

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Annotation. This article depicts the study of the educational system in Uzbekistan and the definition of its trends and milestones is inextricably linked with the history of the republic Uzbekistan. Many statistical sources and numerous archival materials have been analyzed. It has been identified and justified that the history of formation and development of education system in the period of the end of 19th and mid 20th century are relayed with the feature of development of its separate stages, the socio-economic level of development of Uzbek society, trends of its cultural formation in a certain period of time. At each stage, the problem has been set and solved as possible to fulfill the educational needs of Uzbek society.

Annotatsiya. Ushbu maqolada O'zbekiston ta'lim tizimini davrlashtirishning asosiy bosqichlari va tendensiyalari O'zbekiston respublikasi tarixi bilan bog'liq ravishda o'rganilishi ko'rib chiqilgan. Ko'pgina arxiv materiallari va statistik manbalar tahlil qilingan. 19-asrning oxiri va 20-asrning o'rtalaridagi davrda ta'lim tizimining rivojlanishi va ta'lim tarixining shakllanishi, bazi bir davrlardagi rivojlanishning o'ziga hosligi va o'zbek xalqining madaniy shakllanishi tendensiyasi, ijtimoiy-iqtisodiy rivojlanish darajasi bilan bog'liqligi aniqlangan va asoslangan. Har bir davrda O'zbek xalqining ta'limga bo'lgan ehtiyojlarini bajarish imkoniyatlariga qarab hal qilinganligi yoritilgan.

Аннотация.В данной статье рассмотрены изучены периодизации образовательной системы Узбекистана, определение её тенденций и основных этапов, неразрывно связанных с историей Республики Узбекистан. Проанализированы статистические источники и многочисленные архивные материалы. Выявлена и обоснованаистория становления и развития системы образования в период с конца 19 середины 20 вв. развития ее отдельных этапов, специфики, связанных с социально-экономическим уровнем развития узбекского общества, тенденций и его культурного становления в определенный отрезок времени. На каждом этапе по мере возможности ставились и решались задачи по выполнению образовательных потребностей общества Узбекистана.

Key words: education, periodization, social and historical development of the state, education system, historical pedagogical science, history of education, scientific ethics, modernization, culture, development, study.

Kalit so'zlar: Ta'lim, davrlashtirish, jamiyatning ijtimoiy-tarixiy rivojlanishi, ta'lim tizimi, tarixiy-pedogogik fan, ta'lim tarixi, ilmiy axloq, modernizatsiyalash, madniyat, rivojlanish, tadqiqot.

Ключевые слова: Образование, периодизация, социально-историческое развитие государства, образовательная система, историко-педагогическая наука, история образования, научная этика, модернизация, культура, развитие, исследование.

This article depicts the study of trends and milestones of periodration of the education system in Uzbekistan inextricably linking with the history of Republic of Uzbekistan. Education as elaborate system and its results have the social content, an orientation, certain spatial borders caused by social historical development of the specific state, its culture. Therefore, studying of educational system of Uzbekistan, determination of its tendencies and main stages is inseparably linked with Republic Uzbekistan history.

The analysis of statistical sources and numerous archival materials, scientific research allows to speak with good reason about need of overcoming stereotypes and revaluations of the developed views about ways of development of an uzbek education system at the end of the 19th century and social consequences of educational and cultural processes in the first half of the 20th century.

The problem of a periodization of educational system in Uzbekistan create special relevance in modern conditions. It is connected first of all with emergence of topical and poorly studied issues of history of Uzbekistan – problems of a periodization of historical science, a quantity, structure, literacy of gender and age national groups of Uzbekistan of the end of the XIX beginning of the 20th century of century, etc.

Questions of a periodization of educational system in Uzbekistan have important value for identification of sources, its internal law that is important for scientific generalization in a historical pedagogical science. The periodization determines essence of the main content of the genesis of educational system characteristic of the specific country, the region or mankind in general.

In modern historical and pedagogical science there are various approaches to a problem of a periodization of educational systems. Complexity of this problem consists that very not just to establish single criterion, the basis capable to satisfy requirement as in concerned partitioning of the world historical process, so its regional histories. Specific results of educational reforms in general can't be removed from their plan and execution as their impact on education is mediated by various socio-cultural factors.

Undoubtedly, any periodization is approximate and conditions. It is very difficult to establish exact dating large historical pedagogical processes depending on tendencies of social development on this or that round of history. Questions of a periodization of history of educational system of this or that state are closely connected with common problems of outlook, movement of society from one social and economic formation to another, more progressive.

The problem of a periodization of history of educational system is as it has been already told by a problem of a methodological order. In the Soviet pedagogical historiography tried to solve problems of a periodization more than

once. Still in the late fifties on pages of the "Soviet Pedagogics" magazine the discussion on education history periodization problems was played. Scientists various periods and their time spans, the principles and criteria of a periodization moved forward. However, it wasn't succeeded to come to a consensus concerning a periodization of scientific educational system. This fact can be explained with prematurity of studying of a periodization as studying of problems of history of education and pedagogics still was not up to standard. These years' development of questions of history of education and pedagogics only began.

The periodization of history of educational system of Uzbekistan is very closely connected with a periodization of national history. But at the same time, as we know, any science has concrete features of the periodization which reflects specifics of development of her process in various historical stages. Not an exception in this plan and the historical and pedagogical science studying sources of formation and a tendency of development of educational processes, a pedagogical thought in all of them contradictions.

The research of concrete historical and pedagogical processes gives the chance of creation of a certain periodization. It is necessary to remember that the scientific periodization in any historical science is not a prerequisite of studying of history, but result of its studying.

The research of the historical and pedagogical past demands in a charge with theoretic-methodological provisions, objective approach, respect for scientific ethics in assessment of these or those pedagogical process. As shows the analysis of researches on history of education and a pedagogics, many researchers haven't departed from the traditional, not having the importance approaches in assessment of last pedagogical ideas, systems. In particular, some researchers adhere vulgar pragmatic to approach at which in the historic past only those phenomena, provisions, which is important to the defined social group are perceived and appreciated today. Sometimes researchers deliberately lower those historic facts, the pedagogical phenomena, which don't correspond to their interests, don't satisfy to today's requirements. Of course, such approach leads to falsification of historical reality, to denial of informative value of history of an education and pedagogics for society.

Also in historical and pedagogical researches the attempt of modernization, modernization of historical and pedagogical processes is observed that obviously contradicts the fundamental principles historical pedagogical knowledge.

At a research of problems of history of education, a necessary condition is observance of the main methodological functions to which belongs epistemo-logical, heuristic, predictive, social and axiological, evidential and educational.

The periodization of historical and pedagogical process, in particular, of an education system of Uzbekistan, corresponds to the main stages of social and economic development of society. Each historical period consists of several stages.

Stage – the separate period in development of some historical and pedagogical phenomenon, process which is characterized by a direction on the decision certain social and economic, the political and other tasks. The stage can be subdivided into

the separate temporary stages reflecting the changing specifics of both conditions, and the most historical and pedagogical process or the phenomenon conditionally

Despite availability of researches, in the Uzbek historical and pedagogical science the characteristics of its main stages is insufficiently proved. Characterizing stages of development of a domestic education system, it is necessary to tell also about those factors which also exerted the impact on formation and educational development. They include:

• social and economic and cultural development of the USSR and Uzbekistan during the considered period;

• literacy level, educational potential of the population;

• an educational situation in general, including features of development of general and professional education as in general in the USSR, and in Uzbekistan;

• ethnosocial, ethnocultural, ethnopedagogical factors and features of uzbek and other people of Uzbekistan.

As criteria for determination of stages of development of an education system it is possible to allocate the following:

1. Administrative-territorial changes and their influence on formation of an education system;

2. Types of educational institutions.

3. Preparation and retraining of a professional personnel for the national economy of the republic;

4. Program and substantial base of process of education at all levels;

5. Methodical ensuring didactic process in all types of educational institutions.

The analysis and comparison of a periodization in national history allowed us to offer the following periodization in formation and development of educational system of Uzbekistan.

The first period which began in the late sixties of the 19th century and lasting before establishment of the Soviet power in Uzbekistan in 20th years of the XX century, conditionally has several stages. This period is characterized by the beginning of formation of a basis of educational system, origin and development of a pedagogical thought in Uzbekistan.

The first stage – the 1860-1890th. is characterized by acceptance an imperial state of a number of administrative reforms, final accession of Uzbekistan to Russia, the beginning of intensive capitalist development in Russia and its penetration into suburbs. All these factors combined had significant effect on formation of bases of an education system in Uzbekistan, opening of various types of educational institutions, origin of an advanced pedagogical thought. Carrying out missionary policy in the field of culture, education.

The second stage – 1890-1910. These years are connected with resettlement policy of imperial Russia. The bulk of immigrants settled in the northern regions of Uzbekistan.

The periodization of historical and pedagogical process, in at the end of the XIX - the beginning of the 20th centuries Was developed and created the original education system answering to conditions, life, cultural traditions of the Uzbek

people. Succession of all types of educational institutions was undoubted advantage of this system, including also professional education. The main efforts in case of establishment of new system of educational institutions were directed to elementary school, the first and important stage of training. It was important first of all for the Uzbek people, development of its culture. If expansion of elementary schools didn't take place, then achievements in a construction of school system in the future would be impossible.

The third stage-the 1910-1920th. Revolution of 1905-1907, growth of political activity of a people at large forced the imperial government to increase assignments for education. These years were marked by a certain progress in development of school case. The number of schools, gymnasiums and pro-gymnasiums increased, teacher's seminaries open, the quality of vocational schools grows, female education finds the development, the cultural commonwealth of the Russian and Uzbek people amplifies. The education system in Uzbekistan finds the further formation and development in various types and levels of educational institutions.

Thus, since the second half of the 19th century till 20th years of the 20th century in Uzbekistan the network of educational institutions, different types, content, the orientations which were further a basis of educational system of Uzbekistan arises. Word by word, different ethics of educational institutions, a classness-all these signs were characteristic at this stage of formation of an education system.

The second period – (the 20th - the beginning of the 30th of the 20th century). It is connected with final establishment of the Soviet power in Uzbekistan, creation of the Uzbek Soviet Socialist Republic, a construction of elementary school. This is characterized by complexity as in formation of the young state, and the educational processes happening in its territory. However, it is impossible to deny also those positive facts which were observed in a construction of bases of an education system of the republic. This opening of boarding schools, active interest in education of girls both Uzbek, and other nationalities. Acceleration of rates of a school construction allowed to increase the number of pupils in all types of schools. Also average and higher educational institutions open, theoretical bases of content of education at new socialist school are developed, the state control of an education system is established. This period is characterized by the following levels of educational institutions:

1. Schools of the first step (elementary school and schools' communes).
2. Schools of the seven-year-olds.
3. Schools of the second step.
4. Technical schools (3-4 years of training).
5. Higher educational institutions.

Of course, the main efforts when forming a new education system were directed to elementary school, the being basis of educational system.

The third period – (the beginning of the 30th - the middle of the 50th of the 20th century). It is the period of further educational development in all its

contradictions, difficulties, achievements, losses. This period is subdivided into several stages.

The first stage – is characteristic the 30-40th years solutions of tasks of an initial general compulsory education, liquidation of illiteracy among the uzbek population.

Ideologization, politicization of an education system especially is actualized these years. During this period color of the Uzbek intellectuals the best representatives of the Uzbek people, people of high spiritual and intellectual culture was destroyed. Slow, but steady approach to national school, to a national component in content of education, on national languages of training, on national originality begins with the middle of the 30th years.

In the mid-thirties according to requirements of the state ideology the new educational model working in a one-man management mode according to single programs, with the accurate charter and the schedule affirmed.

The second stage – years of the World War II are connected with difficulties in educational development. The number of schools is reduced, many pupils of the senior classes together with adults worked with machines, worked in collective farms, helped with the care of the wounded. However, despite difficulties of wartime, certain success in the solution of teaching and educational tasks of high school, training of research and educational personnel, formation of educational institutions of different types and levels was achieved. The educational system of the republic continued to develop with features inherent in it.

The third stage – post war years – the middle of the 50th years. This time is connected with completing entering of seven years' education, increase in schools and the number of pupils in them, development of a professional education. Qualitative and quantitative indices of system of education both in the USSR, and in Uzbekistan have positive results. Undoubted advantage can be considered systematic, a complementary of different levels, education steps. During this period entering of an initial education comes to the end, the single typology of schools is created, the number of seven-year and high schools' increases, average professional and higher educational institutions open. High-quality changes are undergone also by content of education at all steps of training.

Thus, the research of history of formation and educational development during the period since the end of the XIX-middle of the 20th centuries allowed to reveal an originality of development of its separate stages, the specifics connected with the social and economic level of development of the Uzbek society, a tendention of its cultural formation in a certain interval of time. At each stage tasks of performance of educational requirements of the Uzbekistan society were set and solved whenever possible.

Of course, this scheme of a periodization of educational system doesn't apply for final and indisputable version. Some specifications are possible, but the main thing remains the fact that during the period since the end of the XIX to the middle of the 20th centuries the educational system of Uzbekistan was formed and has gained further development in the next years.

Achievements of today, positive experience in educational system can not be estimated correctly without knowledge of its sources, tendencies of his development, regularities and the principles, features at each stage of development of our state. It once again confirms complexity of historical and modern formation and development of educational system. Many pedagogical processes, the phenomena which were widely adopted today contain the roots, bases in the historical past.

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