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QUANTITATIVE EVALUATION OF THE PURIFYING ORGANS FUNCTION IN NUCLEAR MEDICINE: THE MEMORY OF THE FUTURE

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The disciplines of medicine and physics are like oil and vinegar, often shaken together, often appetizing but not easily miscible. We attempt to blend the soothing oil of medicine with the acid reality of physics in a study of how the kidney works.
Lloyd Luke, 1971

Abstract. *This paper is the presentation of the fundamentally new approach to the quantitative assessment purifying functions of an excretory organ based on the modern dynamic radionuclide studies. The indicator of the function state of the organ is the relative fraction of the minute circulation volume, which completely cleared by the tested organ – the effective fraction of cardiac output (EFMO), calculated from the activity-time curve, recorded over the heart after injection into the blood circulation of the testing radiopharmaceutical.*
Keywords*: nuclear medicine, dynamic radionuclide studies, purifying organs, cleaning function test*

In the recent decades, clinical radiology received unprecedented technological progress gifted by physicists. Physicists have created and perfected CT, HRCT, PET, SPECT, MRI, functional MRI, digital ultrasound, PET-CT. These new diagnostic modalities gave to physicians the ability to see not only the finer details of the anatomical structure of the internal organs and tissues of the patient, but also the mechanical properties of tissue and the mechanics of the processes of the blood circulation compared norm and pathology [1-9].

However, nuclear medicine studies of the dynamic functional processes, of the principles and the models which have been developed by physicists together with the clinicians at 60-90th years of the last century [10-18], unfortunately, remained on the roadside of the progress. This section of Clinical Radiology, whose development requires cooperation of medical researchers and physicists is used in clinical practice at a level that is too far from his significance in the clinical management of patients [19]. In addition, the cost of new technologies remained aside, and, that is the

principal impossibility, the latest technology are untenable to record of dynamic processes in the body during sufficient time (an hour or even more) that correctly to determine quantitatively of the dysfunction level.

The greatest success in nuclear medicine link of the clinical radiology have been made to create mathematical models and their practical testing for quantitative assessment of the common blood circulation and excretory organs, including the kidneys and the liver [20-28].

This paper presents the further improvement of the principles of quantification of the excretory organs function indices using the dynamic nuclear medicine tests. The impetus for this is the emergence of new radiopharmaceuticals, specifically eliminated from the blood by the different ways.

Let us consider the case of radionuclide study where using the radiopharmaceutical (RPh) that specifically removed from the blood by the examined organ (hereinafter − purifying organ). A curve of the RPh concentration in the blood in time (activity-time curve) recorded above an organ through which the vessels the circulating blood transits, e.g. the heart (hereinafter − the transit organ).

It is obvious that at the first pass through the transit organ RPh activity, present in the moment t in this organ, is the difference between the activity of the RPh, entered at this point of time in the transit organ ($a_i(t)$) and the activity of the RPh extruded from it ($a_o(t)$).

Therefore, activity-time curve R(t) can be written in such equation:

$$R(t) = k(a_i(t) - a_o(t)), \qquad (1)$$

where **k** − the proportionality factor between the RPh activity present in the organ, and the count rate recorded above organ of this time.

Obviously, the value of $\mathbf{a_i(t)}$ is equal to the product of two quantities – total activity of the injected RPh and the likelihood that the transit times of the RPh molecules to entry into the transit organ is less than or equal to **t**. This probability is a function of the distribution of transit times RPh molecules from its point of the injection to the entrance of the transit organ, i.e.:

$$a_i(t) = AF_i(t),$$

where $\mathbf{F_i(t)}$ − the above distribution function, A − total activity of the injected RPh.

Similarly:

$$a_o(t) = AF_o(t),$$

where $F_o(t)$ − distribution function of the transit times of the RPh molecules from its point of the injection to the exit from the transit organ.

Then we can write from (1):

$$R(t) = kA(F_i(t) - F_o(t)).$$

So let us calculate the area under the curve of the first pass RPh through the transit organ:

$$S_0 = \int_0^\infty R(t)dt = kA\int_0^\infty (F_i(t) - F_o(t))dt \qquad (2)$$

and convert the equation:

$$\int_0^\infty (F_i(t) - F_o(t))dt = t(F_i(t) - F_o(t))\Big|_0^\infty - \int_0^\infty t(f_i(t) - f_o(t))dt. \qquad (3)$$

Because $F_i(\infty) \equiv 1 \equiv F_o(\infty)$, the first term of the right-hand side of (3) is equal to zero, therefore:

$$\int_0^\infty (F_i(t) - F_o(t))dt = \int_0^\infty tf_o(t)dt - \int_0^\infty tf_i(t)dt = \bar{t}_o - \bar{t}_i, \qquad (4)$$

where $\bar{t}_i$ and $\bar{t}_o$ are average transit times from the point of introduction of the RPh to an entrance of the transit organ and to an exit from it, respectively.

It is obvious that $\mathbf{t_o = t_i + t_t}$, where $\mathbf{t_t}$ – transit time of the RPh in the transit organ. As the random variables $\mathbf{t_i}$ and $\mathbf{t_t}$ are independent random variables, we can write:

$$\bar{t}_o = \bar{t}_i + \bar{t}_t \quad \text{or} \quad \bar{t}_t = \bar{t}_o - \bar{t}_i.$$

Comparing the last formula on the right side of (4) and taking into account the expressions (2) and (3), it is easy to understand that:

$$S_0 = kA\bar{t}_t.$$

So, the area under the curve activity-time of first pass of the RPh through the transit organ for any law of RPh entrance in this organ is the product of the administered RPh activity with its average transit time in the transit organ and a

factor of proportionality between the count rate over that organ and RPh activity therein.

One of the most important hemodynamic parameters of the body is the minute volume of circulation (MVC shorter MV), i.e. the volume of blood, flowing through the cavities of the heart per minute. In adult MV is about 5–7 liters per minute.

Ejected by the left ventricle into the aorta the blood is distributed at the network of arteries, delivering it to the organs and tissues. Some part of the MV passes through each organ including through the purifying organs.

The most important of all purifying organs are the kidneys. In a normal adult human about 25% of the blood, ejected by the heart, passes through the kidneys. Such rich blood supply is provided by the anatomy of the renal arteries extending from the abdominal aorta like a short thick trunk.

They distinguish for the kidneys: **total renal circulation** (TRC) – the amount of blood passing through the entire kidney per minute, and **effective renal circulation** (ERC) – blood flow through functioning renal parenchyma per minute, which accounts about 90% of the TRC. TRC has the ability to autoregulation – to remain constant. ERC in renal disease is reduced in proportion to the extent of damage of the kidney purifying function. This in turn leads to lower values of the ratio of ERC/MV in this condition. Consequently, the ratio between the effective renal circulation and minute volume of circulation – ERC/MV – can be a very valid indicator of the kidneys purifying function in all circumstances, moreover independent of all other terms and conditions. In its physiological fact, this figure is the **effective fraction of minute volume of circulation** (EFMV) for the tested purifying organ.

Assessment of the ERC state is carried out by an indirect method of a clearance – measuring the ability of the cells of the renal parenchyma to the almost complete removal of the blood test substances. For this purpose, use of such compounds as paraaminohippuric acid (PAH), diodrast, creatinine. However, this method has some limitations, it is burdensome for the patient and provides significant errors, so the use of this method clinically impractical.

Let the RPh, which selectively extracted by the kidneys, is introduced into the bloodstream. Within a minute the kidneys cleanse out of the RPh from the fraction of the MV which strictly equal to the absolute value of the quantity of the ERC. Further the purified blood returns to the general circulation and reduces the concentration of the RPh in it proportionally to the ratio of ERC/MV. Thus, the ERC in the general circulation can be formally regarded as a fraction of the MV, completely free of the RPh at the same its concentration in the rest of the MV.

Denote the ratio of ERC/MV by the coefficient **φ** and write in the form of the equation: **φ =** ERC/MV = EFMV.

The coefficient **φ** is the probability that the molecule of RPh walk into a purifying organ on the first pass of blood through the circulatory system. Hence the probability $\mathbf{p_n}$ of that the molecule will be captured at the **n**-th pass is calculated as follows:

$$p_n = \varphi(1-\varphi)^{n-1}$$

Now we calculate the total area ($\mathbf{S_c}$) under of the activity-time curve recorded above the transit organ. Since, as above mentioned, when passing through a purifying organ of the RPh portion, corresponding contribution in the total area is not dependent on input law of this portion and is determined only by its activity and the average transit time of the RPh in the transit organ, it can be written:

$$S_c = k\bar{t}_t\left(a_1 + 2a_2 + 3a_3 + ...\right) = k\bar{t}_t \sum_{n=1}^{\infty} n a_n , \qquad (5)$$

where a_1, a_2, a_3, ... – activity of those portions of the RPh that were captured in the first, second, third, etc. drug passes through the circulatory system, respectively.

Clearly, $a_n = Ap_n = A\varphi(1-\varphi)^{n-1}$, therefore taking into account (5) we can write:

$$S_c = kA\bar{t}_t\varphi\sum_{n=1}^{\infty} n(1-\varphi)^{n-1}$$

Transforming the last expression and using the formula for the sum of a geometric progression, we obtain:

$$\sum_{n=1}^{\infty} n(1-\varphi)^{n-1} = \frac{1}{\varphi^2} \quad \text{and} \quad S_c = \frac{kA\bar{t}_t}{\varphi}.$$

From here: $$\frac{S_0}{S_c} = \varphi,$$

i.e. value of the EFMV is the ratio of the area under the curve of the first pass of the RPh through transit organ allocated from recorded above this organ the activity-time curve, to the area under the total activity-time curve.

It deserves to be noted that the simple calculations lead to the following interesting result: $$\frac{1}{\varphi} = \bar{n},$$

that is the inverse of EFMV, equal to the average number of passes of the RPh molecules through the circulatory system until they are captured by purifying organ.

The above principles for determining the level of kidney function by using dynamic radionuclide studies are applicable also to examine of the purifying functions of the liver using proper purpose radiopharmaceuticals.

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Кількісна оцінка функції очисних органів в ядерній медицині: спогади про майбутнє

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Резюме. Стаття стосується викладу принципово нового підходу до кількісної оцінки очисної функції будь-якого екскреторного органу на основі сучасних динамічних радіонуклідних досліджень. Показником стану цієї функції органу є відносна фракція хвилинного об'єму кровотоку, що повністю очищається органом – ефективна фракція хвилинного об'єму (ЕФМО), яка обчислюється по кривій активність-час, реєстрованої над серцем після введення в кровообіг тестового радіофармпрепарата.

Ключевые слова: ядерная медицина, динамические радионуклидные исследования, депурационные органы, тест очистительной фукции

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Количественная оценка функции очистительных органов в ядерной медицине: воспоминания о будущем

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Резюме. Статья касается изложению принципиально нового подхода к количественной оценке очистительной функции любого экскреторного органа на основе современных динамических радионуклидных исследований. Показателем состояния этой функции органа является относительная фракция минутного объема кровотока, полностью очищаемая органом – эффективная фракция минутного объема (ЭФМО), вычисляемая по кривой активность-время, регистрируемой над сердцем после введения в кровоток тестирующего радиофармпрепарата.

Ключові слова: ядерна медицина, динамічні радіонуклідні дослідження, депураційні органи, тест очисної функції

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ON ANTI-INFLAMMATORY AND ANTIPYRETIC MECHANISM OF COMBINATION DRUG EMPLOYED FOR THE TREATMENT OF BRONCHOPULMONARY ABNORMALITIES

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Abstract. *The study on 30 rats experimentally established the mechanism of anti-inflammatory and antipyretic action of amkesol. These effects depend on polytropic pharmacodynamics of the drug and are associated with restoration of oxidative balance and pro-inflammatory serum cytokine profile, impaired in bronchoalveolitis model.*

Key words: *combination drug, mechanism of action, antipyretic and anti-inflammatory effects, broncho-pulmonary pathology*

The employment of combination drugs, widely practiced in all clinical branches of modern medicine [1], is known to have a range of significant advantages in comparison to monotherapy. Along with reinforcement of therapeutic effect, combination drugs exert influence on basic pathogenesis elements of the abnormality and may even manifest new types of pharmacological action, not typical for their components [2].

Amkesol (AKS) is a combination drug administered for the treatment of respiratory system diseases with antitussive (ambroxol), anti-allergic (ketotifen), broncholytic, expectorant (theobromine, ambroxol, licorice root extract), anti-inflammatory and antipyretic action [3]. Two latter effects are achieved owing to pharmacodynamic interaction of AKS components, though their mechanism requires further study.

Purpose: to carry out a trial study of anti-inflammatory and antipyretic AKS mechanism.

Materials and methods. The experiment was performed according to the requirements of current international and national bioethics (Strasbourg, 1968; Kiev, 2001) on 30 adult outbread white rats of both sexes weighing 120-150 g who were

divided into 3 groups: 1 - intact control, 2 - pathology without treatment; 3 – pathology with treatment.

Proceeding from the premise that both types of the studied AKS action are not typical for its contents and they obviously develop due to its multicomponent pharmacodynamics, the study of their action mechanism was performed on bronchoalveolitis model mimicking inflammatory process directly in the lung tissue [4] and accompanied by an increase in body temperature. The model was induced by inhalation irritant (Sephadex A-25, Sweden) in the upper respiratory tract with further development of aseptic immune inflammation. Administration was carried out under thiopental anesthesia (60 mg/kg) at a dose of 5 mg/kg by Cyclohaler inhaler after which the development of inflammation was observed over 7 and 14 days. The mechanism of anti-inflammatory AKS action was investigated by oxidative equilibrium indices (diene conjugates (DC), malondialdehyde (MDA) and superoxide dismutase (SOD) and catalase activity (CAT)), which are considered to be the universal basis of inflammation, regardless of its origin, and pro-inflammatory cytokines (IL-1β, IL-8, TNF-α) were regarded as antipyretic AKS mechanism indices, reflecting the state of the immune response to thermal protection.

AKS (powder) was administered in isotherapeutic dose of 8 mg/kg, recalculated according to sensitivity of animals to drugs [5], in the form of 10% suspension in 1% starch mucus intragastrically once 1 hour prior to modeling. Diclofenac sodium was used as reference preparation (8 mg/kg).

Results. In bronchoalveolitis model oxidative equilibrium is impaired by an increase in lipid peroxidation (LPO) and a reduction in the activity of antioxidant (AO) enzymes, which is generally reflected in AO ratio value (Table 1).

Besides, cytokine inflammation profile was found to be activated (Table 2), which is accompanied by an increase in body temperature in rats, with a peak in 4 hours following the modeling onset, exceeding the norm during the day.

It is to be noted that the balance between LPO and AO system in the model was impaired to a greater extent at earlier stages of the trial and mainly involved peroxidation processes in comparison to AO-protection, reflecting the severity of the

disease, conditioned by a combination of lung tissue inflammation and processes in their cell membranes [6].

Table 1.

Amkesol effect on oxidative equilibrium state in rats with bronchoalveolitis

Trial conditions	LPO		AO-enzymes		AO-ratio (%)
	DC (%)	MDA (%)	SOD (%)	CAT (%)	
Intact	100	100	100	100	8,32
Bronchoalveolitis, 7th day	186*	129	74	63	2,06
Bronchoalveolitis, 14th day	161*	132	84	90	3,25
AKS, 7th day	134*,**	117	83	109**	3,33
AKS, 14th day	127*,**	104	88	91	5,88

Note: *– P<0,05 in comparison to intact control
** – P<0,05 in comparison to pathology

Table 2.

Amkesol effect on cytokine profile in rats with bronchoalveolitis

Trial conditions	Blood serum cytokines (%)		
	IL-1β	IL-8	TNF-α
Intact	0	0	0
Bronchoalveolitis,7th day	60	20	120
Bronchoalveolitis, 14th day	110*	80*	158*
AKS, 7th day	50**	18	100
AKS, 14th day	10**	5	50**

Note: *– P<0,05 in comparison to intact control
** – P<0,05 in comparison to pathology

At the same time, cytokines increase at later stages reflected the development of chronic inflammation. Against this background, AKS significantly reduces the amount of lipid peroxidation products, especially diene conjugates (from 186% to 134%) and increases catalase activity (109%), even more than in the control group. In view of the above, we can assume that anti-inflammatory AKS mechanism is associated with oxidative balance restoration owing to inhibition of lipid peroxidation processes and stimulation of enzymatic antioxidant protection activity. The dynamics of antioxidant factor alteration in this period confirms the targeting of antioxidant anti-inflammatory AKS action mechanism.

Antipyretic AKS effect as a 2.2% reduction in temperature in milk fever, exceeding the effect of diclofenac sodium both by the extent and duration, was associated with lower levels of blood serum cytokines in animals with bronchoalveolitis. In terms of their productive role in inflammation development in the lung tissue, one can assume that one of antipyretic AKS mechanisms involves a decrease in inflammation inducers IL-1β and TNF-α, which reduces fever manifestation as a pathogenic element of inflammatory response. Given that pro-inflammatory interleukins are considered to be major pathogenic factors of inflammation and its manifestation, namely hyperthermia, we can conclude that a reduction in the number of different forms of cytokines, including IL-1β, determined in our trials, reflects general mechanism of the studied AKS activity.

Conclusions:

1. The mechanism of anti-inflammatory amkesol action (8 mg/kg) is associated with restoration of oxidative equilibrium, impaired in bronchoalveolitis.

2. In the same dose amkesol reduces cytokine production, including IL-1β, elevated in bronchoalveolitis model, reflecting anti-cytokine mechanism of its antipyretic action.

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Звягинцева Т.В., Киричек Л.Т., Мироненко С.И., Кривошапка А.В., Стороженко Е.В.

К механизму противовоспалительного и жаропонижающего действия комбинированного препарата для лечения бронхо-легочной патологии

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Резюме. Экспериментально на 30 крысах установлен механизм противовоспалительного и жаропонижающего действия амкесола. Указанные эффекты зависят от политропной фармакодинамики препарата и связаны с восстановлением окислительного равновесия и провоспалительного профиля

сывороточных цитокинов, нарушенных в условиях модельного бронхоальвеолита.

Ключевые слова: комбинированный препарат, механизм действия, жаропонижающее и противовоспалительное эффекты, бронхо-легочная патология

Звягінцева Т.В., Киричок Л.Т., Мирончeнко С.І., Кривошапка О.В., Стороженко К.В.

До механізму протизапальної і жарознижувальної дії комбінованого препарату для лікування бронхо-легеневої патології

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Резюме. Експериментально на 30 щурах встановлений механізм протизапальної і жарознижувальної дії амкесола. Вказані ефекти залежать від політропної фармакодинаміки препарату й пов'язані з відновленням окислювальної рівноваги та прозапального профілю сироваткових цитокінів, порушених в умовах модельного бронхоальвеоліту.

Ключові слова: комбінований препарат, механізм дії, жарознижувальний і протизапальний ефекти, бронхо-легенева патологія

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THERAPY

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ON THE PROBLEM OF THE DIAGNOSIS OF NONSPECIFIC AORTOARTERITIS

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Abstract. *Nonspecific aortoarteritis (NAA) is a systemic vasculitis of unknown etiology mainly affecting the aorta and its branches. The article adduces the epidemiology, aetiology, pathogenesis, and diagnostics of NAA. Taking into account the scant and nonspecific clinical picture in NAA, a number of authors recommend that all persons under the age of 50 with elevated indices of erythrocyte sedimentation rate and/or C-reactive protein in the absence of obvious reasons for their increase have screening duplex scan of the arteries in the aortic arch and abdominal aorta. It is important to emphasize that proper organization of diagnostic search and subsequent implementation of therapeutic interventions help to improve the prognosis of life of patients with this disease.*

Keywords: *nonspecific aortoarteritis, aetiology, pathogenesis, diagnostics*

Nonspecific aortoarteritis (NAA) is a systemic vasculitis of unknown etiology mainly affecting the aorta and its branches [1, 2]. In accordance with the classification of vasculitis of Chapel Hill Consensus Conference (1994) this disease is defined as "granulomatous inflammation of the aorta and its major branches" [3]. Nonspecific aortoarteritis is also known as Takayasu arteritis, Takayasu disease, middle aorta syndrome, pulse lack disease, syndrome of the aortic arch, Martorell syndrome, the occlusal thromboaortopathy, young women arteritis.

The first reports of this disease appeared in the middle of the XIX century. In 1905 a Japanese ophthalmologist Mikito Takayasu first described the case of a young woman who complained of decreased vision and had specific ringlike arteriovenous anastomosis around the optic nerve head [4, 5]. Oonishi and Kagoshima were the first who connected the changes of retinal vessels with the lack of pulse in the radial artery [5]. Later several cases were registered in Japan, including Yasuzo Shinmi who first used the term "Takayasu arteritis" in 1939 [6]. To call the disease by name of

Takayasu was accepted in Japan, where the number of his descriptions was predominant up to the middle of the XX century.

Morphologically, this disease is characterized by lesion of all layers of the walls of the blood vessels originating from the aorta and mainly localized in their mouths. Therefore, the disease got the most widespread name “nonspecific aortoarteritis” that reflects the clinical-morphological nature of the process. In the English-language literature the term "Takayasu arteritis" is often used.

Epidemiology.

The disease occurs worldwide but it is most common in Japan, Southeast Asia, India, China, and Latin America [7]. Some geographical features of the distribution of NAA of different locations are distinguished: lesions of the ascending aorta and branches of its arc are more frequently observed in Japan; aortitis of brachiocephalic arteries and concomitant lesion of the branches of the aortic arch and thoracoabdominal aorta is dominated in Russia; lesions of the renal artery and the descending aorta are more often registered in South-East Asia [8, 9]. It is noted that NAA predominantly occurs in young women (the ratio of the incidence of women and men is 8:1) usually between the age of 20 to 30 [10]. At the same time, the ratio between men and women in Russia ranges from 1: 2,4 to 1,71 [11-13]. The incidence of NAA is 2,6 cases per one million of population [14] with possible increase, because the data on incidence and prevalence are limited. At the same time in East Asia its frequency is 100 times higher. It is noted that NAA is a common cause of renovascular hypertension in India [15]. In the Italian study [16] it is noted that aortic aneurysm is often found in Takayasu arteritis.

Etiology and pathogenesis.

The main stages of pathogenesis of NAA have been well studied. But the etiology of this disease still remains unknown [17, 18]. Initially the primary etiological factor was supposed to be an infectious agent (mycobacteria, intracellular bacteria and viruses) [19, 20] and even the relationship with tuberculosis was studied [21]. In 1960s it was found that autoimmune mechanisms were involved in the pathogenesis of NAA [22]. However, antigens responsible for the initiation of the

autoimmune response were not identified. It was reported that NAA was comorbid with a number of autoimmune diseases, particularly systemic lupus erythematosus, rheumatoid arthritis, juvenile rheumatoid arthritis, syndrome of Steele, ankylosing spondylitis, inflammatory bowel disease, anterior uveitis, Wegener's granulomatosis, sarcoidosis, amyloidosis, and certain conditions of immunodeficiency [23].

It has been found that NAA is a multifactorial disease. Panarteritis characterized by the infiltration of dendritic cells, T-cells, gamma/delta and others), natural killer cells and macrophages occurs in NNA. It is assumed that an unknown stimulus triggers the expression of heat shock protein 65 in the tissues of the aorta, which is also synthesized in other tissues under stress [24]. This protein, which is a homologue of mycobacteria and other bacteria, stimulates the expression of genes of the major histocompatibility complex class I (MICA). The subtypes of T-lymphocytes, which along with macrophages produce proinflammatory cytokines have been identified. So, gamma/delta T-cells and natural killer cells (NK-cells) expressing NKG2D receptors (activating cytotoxic functions of NK-cells), then infiltrate the arterial wall, recognize MICA on the smooth muscle cells of blood vessels and cause cytotoxic response initiating acute inflammation. These cells secrete perforin – one of the major cytotoxic proteins in the cytolytic granules and one of the effectors of cell lysis. Because of this, the inflammatory response is enhanced through greater infiltration of cells and stimulation of matrix metalloproteinases that contribute to the degradation of elastin and collagen in the arterial wall. Then, infiltration of alpha-beta T-cells and recognition of autoantigens, presented by common epitope (antigenic peptide) in complex with molecules of class I of major histocompatibility complex on dendritic cells, occurs. In addition, the humoral immune system plays a certain role in the pathogenesis of NAA. Thus, antibodies to the structures of endothelial cells that can lead to vascular damage through the formation of inflammatory cytokines, adhesion molecules and apoptosis are detected in patients with NAA [24].

In active phase there is an inflammation with granulomas and giant cells, which are mainly detected in the middle layer of arteries of elastic type [25]. Necrosis

can be seen in the middle layer, often surrounded by giant cells. At the early stages of lesion inflammatory infiltrates are detected in adventitia of vessel, and then they move to parabasal tissue [25]. Infiltration usually consists of lymphocytes, plasma cells and dendritic cells with different numbers of giant cells. Over time chronic changes occur. So, the replacement of the damaged parts of the middle layer of arteries with fibrous tissue, accompanied by loss of elasticity of large vessels, occurs due to chronic inflammation [26]. The lesion of intima is of secondary reactive hyperplastic nature. Myointimal hyperplasia leads to narrowing or complete occlusion of the vessel lumen. In some patients, the inflammation in the arteries is progressing so quickly that connective tissue has no time to be synthesized in sufficient quantities and aneurysms are formed. Neovascularization occurs in proportion to the thickening of the middle layer of the arteries and is a compensatory adaptation of the vessel, providing gas exchange and flow of nutrients into the deeper layers of the vessel [25].

The data of clinical studies indicate the important role of genetic factors in the pathogenesis of NAA [27]. It was demonstrated that human leukocyte antigen (HLA)-B52 and B39 was associated with Takayasu arteritis in Japan, and HLA-DR B1-1301/1302 – in Mexico [24]. Besides, it was found that the high frequency of haplotype HLA A24-B52-DR2 was observed in NAA with aneurysms of the abdominal aorta of inflammatory genesis [28]. Moreover, patients with this haplotype were observed to have more rapid progression of inflammation and more often the tendency to refractoriness to anti-inflammatory therapy [29, 30].

Diagnostics of nonspecific aortoarteritis is based on a thorough medical history collection, detailed clinical examination and necessary laboratory and instrumental studies using standardized diagnostic criteria.

In accordance with the accepted clinical classification 4 types of lesions of the aorta in NAA are distinguished [31, 32].

Type I is an isolated lesion of the branches of the aortic arch;

Type II is a lesion of only a thoracoabdominal segment of aorta with visceral branches and renal arteries, not involving the branches of the aortic arch;

Type III (or mixed) is a combination of the first two types;

Type IV – any part of the aorta can be affected, but with obligatory involvement of the branches of the pulmonary artery.

There are 4 types of vascular lesions in NAA: stenosis, occlusion, dilatation, and aneurysm. A multiple segmental lesion of the aorta and its branches with the presence of stenosis, occlusion, aneurysm formation in the same patient is characteristic for this disease [33, 34]. Initially the inflammatory process is localized in the media and adventitia of vessel, and then moves on parabasal cells. The intimal lesion is secondary reactive hyperplastic in nature.

There is no generally accepted classification. In accordance with the classification proposed by A. V. Pokrovsky (1979) basic clinical symptoms of the disease can be presented in the form of 10 syndromes [33]:

– syndrome of general inflammatory reactions;
– syndrome of lesion of the branches of the aortic arch;
– syndrome of stenosis of the thoracoabdominal aorta, or coarctation syndrome;
– syndrome of renovascular hypertension;
– syndrome of abdominal ischemia;
– syndrome of lesion of bifurcation of the aorta;
– coronary syndrome;
– syndrome of aortic insufficiency;
– syndrome of lesion of the pulmonary artery;
– aneurysmal syndrome.

As to the nature of the inflammatory process there are acute, subacute and chronic stages of NAA.

In acute period the disease begins with fever, pronounced articular syndrome accompanied with early appearance of ischemic disorders, pronounced increase of indicators of acute phase of inflammation in the blood.

In subacute stage – fever (up to subfebrile values) and slow (several months) development of symptoms of vascular lesion are observed.

The chronic course of the disease develops gradually in the form of ischemic syndrome in the pool of the vertebral artery, disorders of vision, and arthralgia.

According to the Institute of Cardiology named after A. L. Myasnikov the following variants of clinical course of NAA are described: latent, subacute and continuously recurrent [35]. Localization of ischemic syndrome is described with the degree of ischemia.

The clinical picture of NAA depends on the pool of arteries involved in the inflammatory process, and stage of disease. Usually at the onset of the disease patients have such nonspecific symptoms as: general weakness (40-70%), low grade fever (10-69%), migratory pain in joints and muscles (25%), weight loss (10-19%). At this stage the lumen of the artery is completely intact. This stage of the disease is also called "the stage of the unchanged pulse" or the phase of active inflammation. The noteworthy fact is that in 50% of cases asymptomatic course of the disease is observed [34]. Most often the symptoms appear at the stage of stenosis and occlusion of blood vessels, or in fibrous-ischemic chronic phase. The clinical manifestations in the lesion of the branches of the aortic arch are due to ischemia of the upper extremities and the brain. Patients with affected subclavian artery complain of weakness and paresthesia in the hands, Raynaud's disease being also revealed. The involvement of the carotid-vertebral artery is manifested as dizziness, orthostatic reactions, headaches, visual disturbances, fainting. Cerebral ischemia may manifest as transient ischemic attacks and strokes. However, it is this type of lesion when a significant discrepancy between the severe lesions of the branches of the aortic arch and the paucity of clinical symptoms is observed [36]. Stenosis of the carotid arteries causes dizziness, headaches, impaired vision. The most frequent complaint is carotidynia (up to 10-20% of cases) – pain in the projection of the common carotid arteries [37]. According to the description of the patients it is aching or shooting pain localized in the anterior surface of the neck, with possible extention to the region of the lower jaw and ears. When the process is localized in the abdominal aorta, celiac

trunk, mesenteric arteries patients usually have nausea, vomiting, abdominal pain, bleeding. In case the renal arteries are affected, arterial hypertension and renal failure are common; in ischemia of the iliac arteries the signs of ischemia of the lower extremities are found; in ischemia of the pulmonary arteries the symptoms are chest pain, shortness of breath, hemoptysis; when coronary arteries are involved – coronary heart disease and heart failure. The frequency of clinical manifestation of Takayasu arteritis is presented in Table 1.

Table 1

Clinical features of Takayasu arteritis [38]

Feature	Frequency, %	Feature	Frequency, %
Syndrome of general inflammatory reactions	66	Arterial hypertension	43
Lack of pulse	88	Aortic regurgitation	33
Noise determined by auscultation	77	Stenosis of the renal artery	26
Pain in the extremities	69	Cerebrovascular events	18
Paresthesia	48	Pulmonary hypertension	12

Objective examination reveals a weakening of the pulse at the radial artery, the difference between systolic blood pressure (BP) on the left and right hand is more than 10 mm Hg, auscultation determines the noise in the projection of the affected vessel; retinopathy and other signs indicating ischemia of organs and tissues are detected. Half of patients have hypertension. Involvement of the renal arteries may lead to the development of malignant hypertension. In the long course of NAA this complication develops in 30-50% of patients, renal artery stenosis being the cause of hypertension in the half of them. It is assumed that in intact renal blood vessels the cause of increased blood pressure is reduction of baroreceptor answer of carotid sinus, formation of coarctation of aorta, cerebral ischemia.

The study of Pokrovsky A. V. et al. [34] found that lesions of the brachiocephalic arteries occurred in 85% of cases of NAA. It should be noted that the subclavian arteries were involved more often (the left artery – almost twice more often than the right one), the process was localized in the second and third segments,

which explains the relatively rare syndrome of vertebral-subclavian victimization. The carotid arteries are rarely involved in pathological process. In recent decades, numerous reports of the failure of the heart, kidney, gastrointestinal tract in NAA, which previously was regarded as extremely rare complications of the disease, have been collected [39]. It was demonstrated that organ lesions occur in more than 2/3 of patients with Takayasu arteritis and predominantly involve the central nervous system (70%) and heart (55,5%), significantly (p=0,01) worsening the prognosis [40].

During the **physical examination** the following procedures are necessary to carry out [40]:

- comparison of the symmetry of the pulse in the region of the radial arteries;
- measurement of blood pressure in both upper and lower extremities;
- auscultation of the common carotid arteries, subclavian arteries, the abdominal aorta.

Laboratory diagnostics.

The results of laboratory studies in NAA are usually not specific and are manifested in the form of accelerated erythrocyte sedimentation rate (50-83% of cases), moderate anemia, thrombocytosis [16]. The increase in C-reactive protein, reflecting the activity of the inflammatory process is observed. There are some reports about the possibility of using highly sensitive markers of vascular inflammation, in particular the content of metalloproteinase-9 and interleukin-6 in serum, in diagnostic purposes to confirm NAA [40]. The study of Dagna et al. noted that levels of pentacene 3 in the serum can be applied for diagnostic purposes (see Table 2). An additional advantage of pentacene 3 as compared with other markers is that unlike other laboratory data there was no nonspecific increase for this indicator in the group of healthy people or in response to an infectious agent.

Instrumental diagnostics.

Angiography is the "gold standard" of diagnostics of NAA. Angiography of the thoracic and abdominal aorta is performed to visualize the aorta and its branches [41, 42]. There are 3 main angiographic models: (1) narrowing of the aorta and/or arteries of various degrees; (2) saccular and/or fusiform aneurysms; (3) a combination

of both. Angiography may determine the involvement of the pulmonary artery and phenomenon of victimization of subclavian artery, allowing to make a sensible choice of endovascular procedures (angioplasty, stenting). The disadvantages of this method are as follows: significant radiation dose and necessity of using large quantities of iodized contrast agent. In addition, angiography can assess only intravascular pathology and does not allow to distinguish acute intramural lesion from stenotic one [43]. In order to reduce the amount of contrast substance and improve the quality of images of vessels of a smaller caliber digital subtraction angiography is used.

Echosonography. **Duplex scanning** is the most convenient method of detection of vascular lesions in NAA. The advantage of ultrasound is the ability to measure the thickness of walls of surface vessels (in particular, the thickness of the intima-media of the carotid artery as a marker of activity of the process) [44]. The most characteristic change in NAA is uniform concentric narrowing of the vessel with no signs of calcification [34]. This study is indispensable at the early stages of the disease. If NAA is suspected, all patients should have the duplex scan of the neck vessels [40].

Computed tomographic angiography (CT angiography). It allows to estimate the thickness of the walls of blood vessels, to visualize the aneurysm, including intramural areas of calcification, the formed thrombus [45]. Transverse image provides greater accuracy. Spiral CT with contrast allows to build two - and three-dimensional images of blood vessels. CT is required for dynamic monitoring of intramural changes in the aorta and pulmonary arteries [46]. The disadvantages of this method include its high cost, the use of iodine-containing contrast agents and radiation exposure.

Magnetic resonance angiography (MRI-angiography) due to the high sensitivity proved itself to be a method of screening vasculitis of the central nervous system, albeit with limited specificity (see Table 2). MRI with contrast enhancement and non-contrast three-dimensional MR- angiography allows to easily identify areas of stenosis of vessels and to detect subtle morphological and pathological changes in

the arterial wall. Significant thickening of the wall in and around the aorta is observed in the acute phase of Takayasu arteritis. In addition, thickening of the vessel wall is detected in the chronic phase, which indicates the possibility of determining the activity of the disease at the tissue level [47, 48]. The main disadvantage of this method is the increase in time of visualisation, as well as contraindications: patient having electronic devices, clips on blood vessels, stents, pacemakers and other surgical hooks, brackets, metal sutures [48]. Wide dissemination of this method is hindered by the high cost and poor visualization of calcified vessels.

Positron-emission tomography (PET) with oxide-18-fluorodeoxyglucose (18F-FDG). When detecting metabolic activity, the presence of inflammation is thus determined [49]. The advantage of this method over echosonography or angiography is the ability to visualize foci of inflammation regardless of the degree of stenosis of the artery. Hemodynamic insufficiency of cerebral blood flow is also determined with the help of PET, according to the evaluation of the perfusion of brain tissue and measuring the fraction of the extraction of oxygen [50].

Table 2.

The value of serological markers and indicators of imaging in NAA diagnosis

Performance	Sensitivity (%)	Specificity (%)
ESR	72*	56*
C-RP	71,4*	100*
FDG-PET	92*	100*
MRI-angiography	100*	100*
CT-angiography	95*	100*
Pentaxin 3	82.1-89**	87-94.1**

Notes: * – for the diagnosis of nonspecific aortoarteritis; ** – in the determination of disease activity. Abbreviations: PET – positron-emission tomography (PET) with oxide-18-fluorodeoxyglucose (FDG); ESR – erythrocyte sedimentation rate; C-RP – C-reactive protein.

Classification criteria

Today in the world practice the criteria proposed by the American College of Rheumatology (1990) are used in diagnosis of nonspecific aortoarteritis (Table 3).

The presence of any three or more of the criteria for Takayasu arteritis is characterized by sensitivity of 91% and specificity of 98% [8].

Table 3.

Classification criteria of the American College of Rheumatology for Takayasu arteritis [51]

1. Development of clinical manifestations characteristic of Takayasu arteritis at the age of 40
2. Intermittent claudication Development or progression of muscle weakness or discomfort in one or more limbs (especially the upper ones)
3. Reduction of the height of the pulse on brachial artery (s)
4. Difference in levels of systolic blood pressure in hands > 10 mm Hg
5. Presence of systolic murmur over one or both subclavian arteries or abdominal aorta
6. Angiographic changes: narrowing and/or occlusion of the aorta, its proximal branches, or large arteries in the proximal upper or lower extremities, not caused by atherosclerosis, massive fibromuscular dysplasia or other reasons. These changes are usually focal or segmental.

The basis of instrumental diagnostics of aortoarteritis is a combination of radiation methods – color duplex scanning and CT/MR angiography or radiopaque angiography, allowing to specify the localization and extent of the disease artery (level of evidence C) [1]. Patients with confirmed diagnosis of NAA need clinical and laboratory monitoring of the activity of the inflammatory process (level of evidence C) [1].

Thus, NAA is a dangerous disease that is difficult to diagnose and that deserves special attention of clinicians. Taking into account the scant and nonspecific clinical picture in NAA, a number of authors recommend that all persons under the age of 50 with elevated indices of erythrocyte sedimentation rate and/or C-reactive protein in the absence of obvious reasons for their increase have screening duplex scan of the arteries in the aortic arch and abdominal aorta [13]. It is important to emphasize that proper organization of diagnostic search and subsequent implementation of therapeutic interventions help to improve the prognosis of life of patients with this disease.

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Беловол А.Н., Князькова И.И.

К вопросу о диагностике неспецифического аортоартериита

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Резюме. Неспецифический аортоартериит (НАА) – системный васкулит с преимущественным поражением аорты и ее ветвей неизвестной этиологии. НАА является сложным для диагностики и опасным заболеванием, заслуживающим пристального внимания клиницистов. В обзоре рассмотрены вопросы эпидемиологии, этиопатогенеза, классификация и пошаговый диагностический алгоритм. Принимая во внимание скудную и малоспецифическую клиническую картину при НАА, ряд авторов рекомендуют всем лицам моложе 50 лет с повышенными показателями скорости оседания эритроцитов и/или С-реактивного белка в отсутствие очевидных причин для их повышения скрининговое дуплексное сканирование артерий дуги аорты и брюшной аорты. Важно подчеркнуть, что правильная организация диагностического поиска с последующей реализацией терапевтических мероприятий позволяют улучшить прогноз жизни пациентов с этим заболеванием.

Ключевые слова: неспецифический аортоартериит, этиология, патогенез, диагностика

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До питання про діагностику неспецифічного аортоартериита

Харківський національний медичний університет

Резюме. Неспецифічний аортоартеріїт (НАА) - системний васкуліт з переважним ураженням аорти та її гілок невідомої етіології. НАА є складним для діагностики та небезпечним захворюванням, що заслуговує на пильну увагу клініцистів. В огляді розглянуті питання епідеміології, етіопатогенезу, класифікація і покроковий діагностичний алгоритм. Беручи до уваги мізерну і малоспеціфічну клінічну картину НАА, ряд авторів рекомендують всім особам молодше 50 років з підвищеними показниками швидкості осідання еритроцитів і/або С-реактивного білку при відсутності очевидних причин для їх підвищення скринінгове дуплексне сканування артерій дуги аорти і черевної аорти. Важливо підкреслити, що правильна організація діагностичного пошуку з подальшою реалізацією терапевтичних заходів дозволяють поліпшити прогноз життя пацієнтів з цим захворюванням.

Ключові слова: неспецифічний аортоартеріїт, етіологія, патогенез, діагностика

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TREATMENT FEATURES OF CILIARY ARRHYTHMIA IN PATIENTS WITH ISCHEMIC HEART DISEASE IN COMBINATION WITH DIABETES INNOCENS

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Abstract. *We studied the efficacy of amiodarone in the 34 coronary heart disease patients suffering from paroxysmal or sustained atrial fibrillation. The functionality of the patients corresponded to II-III functional class NYHA. 18 patients had compensated diabetes II-type, mild to moderate severity. 19 patients (55.9%) had previous myocardial infarction within the period of 6 months of me-up to 2 years. Among them, 11 patients (32.4%) suffered from diabetes. Surveyed patients had exertional angina II-III functional class. The age of patients ranged from 43 to 59 years. Amiodarone has a pronounced antiarrhythmic effect in most patients with atrial fibrillation sufferers as coronary heart disease and ischemic heart disease and diabetes II-type. Treatment with amiodarone has no negative effect on cardiohemodynamics patients examined. Additional useful property of the drug - antianginal effect. Prophylactic administration of amiodarone for the prevention of recurrence of atrial fibrillation is less effective in patients with concomitant diabetes mellitus II-type.*

Key words*: coronary heart disease, diabetes, atrial fibrillation, amiodarone, aprovel, losartan.*

Introduction. The dystrophic changes in the cardiac muscle in patients with diabetes innocens result in dysfunction of the myocardium both auricles and ventricles. No wonder, that ciliary arrhythmia taking the second place of frequency among all disturbances of heart rhythm after extrasystolia (about 40% of all rhythm disturbances), can complicate course of diabetic cardiomyopathy [1, 2, 3]. Last time this problem again becomes the center of attention of cardiologists. First of all it is connected with danger to patients life due to auricles fibrillation caused by tromboembolic complications in difference to a lot of other supraventricles arrhythmias that don't cause danger to life. On the background of diabetes innocens the paroxysmal and steady forms of ciliary arrhythmia especially often appear while the long in time and chronic arrhythmias appear in patient with rheumatic damages,

thyrotoxicosis or ischemic heart disease. The treatment paroxysmal and steady form has the following purposes:

1) The restoration of sinus rhythm using antiarrhytmic drugs or electroimpulse;

2) The prevention of recurrence of fibrillation of auricles after restoration sinus rhythm [4, 5].

Among antiarrhythmic drugs for treatment of paroxysmal and steady forms of ciliary arrhythmia there are drugs of IA class (chinidinum, disopiramidum, novocainamidum), drug of IC class (flecainidum, propaphenonum) and drugs of III class (amiodaronum, dofetilidum, sotalolum, ibutilidum) that are most often applied [7]. However for the patients with diabetes innocens the most suitable drugs are the medicines, which are not influencing on carbohydrate exchange and with the minimal negative inotrope action lowering risk of sudden death. For these purposes the preparations of III class most suitable, especially amiodaronum and dofetilidum. At absence of serious structural damages of a myocardium it is used propaphenonum. Chinidinum is an effective drug, but during long use it increase risk of sudden death. From many antiarrhytmic drugs is the best of all amiodaronum. It has not only expressed antiarrhytmic action, but also decreases considerably risk of sudden death in the patients who have transferred infarct myocardial. It is especially important for patients with diabetes innocens, as the risk of sudden death after infarct myocardial in them is especially high [8, 9, 10].

Materials and methods. We investigated efficiency of amiodaronum in 34 patients with ischemic heart disease having paroxysmal or steady form ciliary arrhythmia. Functional possibilities of these patients corresponded to II-III functional classes. 18 patients suffered the compensated form of diabetes innocens of the 2nd type with mild and average degree of severity. 19 patients (55.9%) have transferred the myocardium infarct earlier (in term from 6 months to 2 years). Among them there were 11 patients (32.4%) had diabetes innocens. The investigated patients had exertion stenocardia (angina pectoris) of II-III functional classes. The patients had the age of 43 to 59 years (on average 54 years). All the patients were separated in two groups: the 1st group included 16 patients with ischemic heart disease in combination

with ciliary arrhythmia; the 2nd group included 18 patients having ischemic heart disease and diabetes innocens of the 2nd type and ciliary arrhythmia. Before the administration of amiodaronum all the patients were registrated with EKG (electrocardiogram), they were asked according to anamnesis. Holters monitoring and ultrasonic heart investigation had been carried out. During carrying out cardioversia amiodaronum was administered intravenously and jetly in the dose 300-450 mg within 10 minutes (the daily dose was to 1200 mg). Then amiodaronum was administered in dose 200 mg 3 times a day. Within 5-8 days, and on the 8th day 200 mg 2 times a day during 7 days.

Results of research and their discussion. The analysis of results of treatment with amiodaronum has shown that cardioversion was more successful in 13 patients (81.3%) of the 1st group and in 11 patients (61.1%) of the 2nd group.

The patients of the both groups treated with amiodaronum demonstrated decrease of frequency and intensity of pain attacks of angina pectoris, reduction of consumption of tablets quantity of nitroglycerine during a day. Antianginal effects of the drug were usually observed by the end of the first week after beginning of drug receiving. During treatment with amiodaronum it was observed significant decrease of heart beat rate (HBR); systolic blood pressure and diastolic blood pressure has not changed. The specified effects were characteristic for the patients of the both group.

According to the ultrasonic data amiodaronum did not result in reliable change of parameters of intracardiac hemodynamics. The symptoms of negative inotropic effect of this medicine were not observed. The left auricle sizes have not changed during treatment (table 1).

With the purpose of prevention of fibrillation recurrence of auricles the patients continued amiodaronum reception in dose of 200-400 mg per day during 6 months. After stopping paroxysms of ciliary arrhythmia or getting rarely to 2-3 per day in 11 patients (68.75%) of the 1st group and in 8 patients (44.4%) of the 2nd group. According to these data the antiarrhythmia activity of amiodaronum in patients with ischemic heart disease in combination with diabetes innocens of the 2nd type was lower than in the group of patients without diabetes innocensWith the purpose of

prevention of fibrillation recurrence of auricles the patients continued amiodaronum reception in dose of 200-400 mg per day during 6 months. After stopping paroxysms of ciliary arrhythmia or getting rarely to 2-3 per day in 11 patients (68.75%) of the 1st group and in 8 patients (44.4%) of the 2nd group. According to these data the antiarrhythmia activity of amiodaronum in patients with ischemic heart disease in combination with diabetes innocens of the 2nd type was lower than in the group of patients without diabetes innocens.

Table 1

Effect of amiodarone on clinical angina, some indicators of cardiac hemodynamics

Indicators	Group 1 (coronary heart disease)		2nd group (coronary heart disease + type II diabetes)	
	Before treatment	After 14 days	Before treatment	After 14 days
The number of angina attacks	2,98±0,36	1,19±0,29 P[1]<0,05	3,32±0,41	1,40±0,24 P<0,05
The amount of nitroglycerin tablets	2,76±0,31	1,21±0,27 P<0,05	2,69±0,29	1,31±0,34 P<0,05
Heart rate per minute	24,9±2,1 P>0,05	20,9±2,8	86,8±5,5	60,2±4,8 P<0,05
Systolic blood pressure, mm Hg	130,3±11,2	128,7±12,3 P>0,05	138,9±12,7	136,4±13,9 P>0,05
Diastolic blood pressure, mm Hg	79,4±6,8	76,3±7,5 P>0,05	85,7±9,3	82,3±8,7 P>0,05
End-systolic left ventricular volume, cm^3	88,6±13,1	86,9±11,8 P>0,05	114,3±12,3	110,8±13,7 P>0,07
End-diastolic left ventricular volume, cm^3	159,9±16,3	160,7±19,5 P>0,05	192,7±15,4	189,4±16,1 P>0,05
Stroke volume, cm	71,6±7,1	74,9±8,7 P>0,05	78,1±5,9	79,6±7,1 P>0,05
Ejection fraction, %*	44,9±3,8	46,3±5,6 P>0,05	40,6±2,3	41,7±3,1 P>0,05
The degree of shortening of the anteroposterior size of the left ventricle during systole,%	22,8±3,2	24,9±2,1 P>0,05	20,9±2,8	22,14±1,9 P>0,05
Speed circular reduce myocardial fibers, c^{-1}	0,99±0,08	1,02±0,06 P>0,05	0,87±0,07	0,88±0,09 P>0,05
Lipoproteins, cm	3,82±0,9	3,79±0,7 P>0,05	3,96±0,8	3,94±0,6 P>0,05

[1] significance of differences between the indices before and after treatment.

The reduction of efficiency of amiodaronum as antiarrhythmia drug was connected, first of all, with development and aggravation of blood circulation insufficiency. Insufficient efficiency of medicamental treatment for ciliary arrhythmia including the patients with ischemic heart disease and diabetes innocens of the 2nd type demands development of new approaches to the choice of the treatment program. A perspective direction, as we consider, is use of drugs reducing progress of structural remodeling (inhibitors of ATF detaining potassium in an organism, blockers of angiotensin–II receptors, first of all, in patients with frequent and long attacks of fibrillation of auricles.

Conclusion:

1. Amiodaronum results in expressed antiarrhythmic effect in the majority of patients with ciliary arrhythmia having ischemic heart disease and combination ischemic heart disease and diabetes innocens of 2nd type.
2. The treatment with amiodaronum does not render negative influence on cardiohemodynamics in the investigated patients. The additional useful property of this drug is the antianginal effect.
3. The preventive use of amiodaronum with the purpose the prevention of fibrillation of auricles is less effective in patients with accompayning diabetes innocens of 2nd type.
4. For more expressed antiarrhytmic effect in case of diabetes innocens it is necessary to combine amiodaronum with renitek or lozartan, aprovelum and also potassium drugs.

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С.И. Латогуз

Особенности лечения мерцательной аритмии у больных ишемической болезнью сердца и сахарным диабетом

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Резюме. Нами изучена эффективность амиодарона у 34-х больных ишемической болезнью сердца, страдающих пароксизмальной или устойчивой формой мерцательной аритмии. Функциональные возможности больных соответствовали II-III функциональному классу по NYHA. 18 больных страдали компенсированным сахарным диабетом II-го типа, легкой и средней степени тяжести. 19 больных (55,9%) ранее перенесли инфаркт миокарда в сроки от 6

месяцев до 2-х лет. Среди них 11 пациентов (32,4%) страдали сахарным диабетом. Обследованные пациенты страдали стенокардией напряжения II-III функционального класса. Возраст больных составил от 43 до 59 лет. Амиодарон оказывает выраженный антиаритмический эффект у большинства больных мерцательной аритмией, страдающих как ишемической болезнью сердца, так и ишемической болезнью сердца и сахарным диабетом II-го типа. Лечение амиодароном не оказывает отрицательного влияния на кардиогемодинамику у обследованных больных. Дополнительное полезное свойство препарата – антиангинальный эффект. Профилактический прием амиодарона с целью предупреждения рецидивов фибрилляции предсердий оказывается менее эффективным у больных с сопутствующим сахарным диабетом II-го типа.

Ключевые слова: ишемическая болезнь сердца, сахарный диабет, мерцательная аритмия, амиодарон, апровель, лозартан.

С.І. Латогуз

Особливості лікування миготливої аритмії у хворих ішемічною хворобою серця та цукровим діабетом

Харківський національний медичний університет, Україна

Резюме. Нами вивчена ефективність аміодарону у 34-х хворих на ішемічну хворобу серця, які страждають пароксизмальної або стійкою формою миготливої аритмії. Функціональні можливості хворих відповідали II-III функціонального класу за NYHA. 18 хворих страждали компенсованим цукровим діабетом II-го типу, легкого та середнього ступеня тяжкості. 19 хворих (55,9%) раніше перенесли інфаркт міокарда в терміни від 6 місяців до 2-х років. Серед них 11 пацієнтів (32,4%) страждали на цукровий діабет. Обстежені пацієнти страждали стенокардією напруги II-III функціонального класу. Вік хворих склав від 43 до 59 років. Аміодарон має виражений антиаритмічний ефект у більшості хворих миготливою аритмією, які страждають як ішемічною хворобою серця, так і ішемічною хворобою серця і цукровим діабетом II-го типу. Лікування аміодароном не робить негативного впливу на кардіогемодинаміку у обстежених хворих. Додаткове корисна властивість препарату - антиангінальний ефект. Профілактичний прийом аміодарону з метою попередження рецидивів фібриляції передсердь виявляється менш ефективним у хворих з супутнім цукровим діабетом II-го типу.

Ключові слова: ішемічна хвороба серця, цукровий діабет, миготлива аритмія, аміодарон, апровель, лозартан.

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RATIONAL THERAPY OF PSORIASIS ASSOCIATED WITH CARDIOMETABOLIC DISORDERS

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Abstract. *The risk of cardio metabolic disorders is very high in psoriatic patients that associated with higher mortality. The aim of this study was to search of comorbidity psoriasis and cardio metabolic disorders for development of pathogenetic treatment and to investigate effectiveness of metabolic treatment on dermatological and cardio metabolic indicators of patients suffering on psoriasis combined with cardio metabolic disorders. The study was conducted on two groups of patients. Different cardio metabolic violations were determined in 144 patients of 1 group and 69 patients of 2 group, respectively 78,6 % and 88,5 %. The patients of 1 group (183 examinee) were treated with traditional anti psoriatic therapy, patients of 2 group (78 examinee) were treated with metabolic therapy. The statistically significant difference between indexes in the dynamics of treatment of psoriasis first and second groups has not been detected (p>0,1). – 41 % and 44 % respectively. The more pronounced improvement of all cardio metabolic indicators was revealed in patients receiving metabolic therapy, particularly improvement of sleep (22,9 %), lowering of the blood pressure (59,7 %), decreasing of headaches (43,0 %) and reducing of cardiac dyspnea (22,9 %). The positive dynamics of key parameters of blood, reflecting lipid and carbohydrate metabolism, did not differ significantly between the groups. Using of metabolic therapy of psoriasis combined with cardio metabolic disorders makes possible to avoid medication for cardio metabolic comorbidity correction, or eliminate the use of already assigned symptomatic therapy.*

Key words: *cardio metabolic disorders, co morbidity, psoriasis, therapy.*

This article is a fragment of the study “Rational therapy patients of psoriasis associated with cardio metabolic disorders considering etiopathogenetic factors” of the department of dermatology, venereology and medical cosmetology belonging Kharkiv national medical university, state registration № 0112U001815.

Introduction. The question about comorbidity of psoriasis is very actual and socially significant. Treatment of dermatosis considering its comorbidity has been difficult and controversial problem. It is known, the risk of cardiovascular disorders is very high in psoriatic patients, that associated with higher mortality [1]. In study M.E. Roberts et al. [2] was shown, that the most frequent reasons of mortality among

psoriatic patients were cardiovascular disorders (heart attack, cerebral and peripheral vascular disease). Similar results have been shown in a recent study [3]. According to current data, the rate of hypertension among patients with psoriasis is significantly higher than in the control group [4]. Recent studies have shown that psoriasis is independent risk factor for myocardial infarction and the patients with severe psoriasis have a greater risk of myocardial infarction [5-6].

The psoriatic arthropathy is accompanied by metabolic disorders, that manifest by deviation of protein metabolism with the development of hyperuricemia and podagra, carbohydrate metabolism (hyperglycemia, association with diabetes mellitus) and lipid metabolism (dyslipidemia, atherosclerosis, coronary heart disease, brain strokes, hypertension) [7-8]. Psoriatic patients have a higher prevalence of hyperlipidemia [8-9], abdominal obesity [4, 10], diabetes mellitus II type [11] and coronary heart disease [5]. These violations often form a metabolic syndrome. According to different authors, metabolic syndrome is detected much more frequently in patients with psoriasis, than in the control group [11, 12]. Mortality among psoriatic patients previously treated with drug therapy was 14,4 %, and those that did not receive antipsoriatic therapy was 10,5 % [1]. This fact demonstrates the urgency of psoriasis comorbidity analysis for choosing the optimal and safe treatment.

The aim of this study was to search of comorbidity psoriasis and cardio metabolic disorders for development of pathogenetic treatment and to investigate effectiveness of metabolic treatment of dermatological and cardio metabolic indicators of patients suffering on psoriasis combined with cardio metabolic disorders.

The object and methods of the study. The 261 psoriatic patients were examined and treated in an outpatient dermatologic city clinic № 5 in Kharkiv (Ukraine) during 2011-2014 years. Treatment of patients with psoriasis was performed according by Ministry of Health of Ukraine Order № 312 from 05.08.09 "On approval of clinical protocols medical providing care for dermatovenereological patients." The conventional therapy included hyposensitization, microcirculatory and tranquilizing action drugs, adaptogens, immunomodulators, vitamins, topical keratolytics, corticosteroids, emollients. Considering high comorbidity of psoriasis

and cardio metabolic disorders, we proposed combine therapy of psoriatic patients with using metabolic and cardioprotective drugs: infusions of Pentoxyphylline 0,5 mg in Ringer's lactated solution 200 ml every other day № 5, alternating with 1,5 % solution of Meglumine sodium succinate infusions 400 ml on alternate days № 5, intravenous injections of essential phospholipids 5 ml in 5 ml autoblood once a day № 10 and Magnesii sulfas intravenous injections 5 ml 25 % solution in 5 ml physiological saline once a day № 10. [13-17].

Standard examination of all patients have been provided: clinical blood and urine analysis, feces analysis on helminth eggs, RPR (rapid plasma reagin) by unified methods. The blood glucose level has been determined by the glucose oxidase method. [18]. The weight, height, waist and hips, systolic and diastolic blood pressure were measured. According dermatologist ’s prescribing, the ultrasound examination, chemistry panel, expert advice of gastroenterologist, neurologist, endocrinologists, internists, etc. were provided. PASI and DLQI-Dermatology Life and Quality Index were calculated [19-20].

Results of the study and its discussion. All patients have been divided on two groups (Table 1). Patients 1 group (183 examinee) were treated with traditional anti psoriatic therapy.

Patients of 2 group (78 examinee) were treated with metabolic therapy. As a result of combined treatment, the clinical improvement of psoriasis occurred in varying degrees, that accompanied by decrease in desquamation, erythema and infiltration, regressing of psoriatic plaques, disappearance of koebnerization, significant decrease and disappearance of itching. Average PASI decreased on 43 % (from 21±6,4 to 12±4,8).

There was no significant difference between patients 1st and 2nd group, reducing of clinical index was 41 % and 44 % correspondingly. Also the impact of psoriasis on quality of patients life was reduced and specific index is increased of 2 points after 10 days of treatment in both study groups (Figure 1).

The statistically significant difference between indexes in the dynamics of treatment of psoriasis first and second groups has not been detected ($p>0,1$).

Table 1

Comparative characteristic of groups

Criteria	1 group		2 group	
	abs	%	abs	%
Number of patients	183		78	
Male	144	78,7	55	70,5
Female	39	21,3	23	29,5
Average age (years)	47±13,64		51,3±13,91	
Age to 39 years	67	36,6	23	29,5
Age 40-60 years	89	48,6	47	60,3
Age >60 years	27	14,8	8	10,2
PASI<10	9	4,9	7	8,9
PASI 11-30	149	81,4	64	82,2
PASI>30	25	13,7	7	8,9
Average PASI	23±7,6		20±5,7	
DLQI 0-5	25	13,7	3	3,8
DLQI 6-10	98	53,6	30	38,5
DLQI 11-20	44	24,0	36	46,2
DLQI 21-30	16	8,7	9	11,5
Average DLQI	7±2,9		7±3,6	

Different cardio metabolic violations were determined in 144 patients of 1 group and 69 patients of 2 group, respectively 78,6 % and 88,5 %. The dynamics of cardiometabolic disorders observed by the main subjective and objective indicators that were controlled on the 1-st and 11-th days of traditional or metabolic therapy for psoriasis.

The positive dynamics was registered among all studied parameters in both groups of patients. Thus, the sleep disturbance were registered in 139 patients with psoriasis, while improving of sleep was detected in 60.4% of patients first group and 83.3% of the second group after treatment (Figure 2).

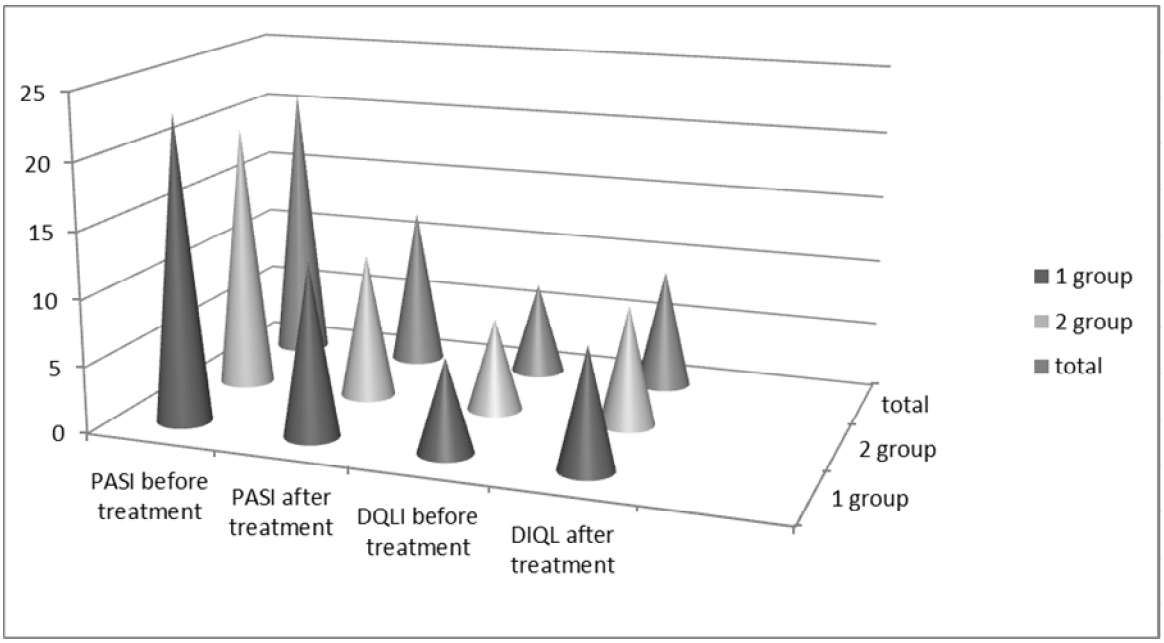

Figure 1. Dynamics of PASI and DIQL in process of treatment of patients with psoriasis.

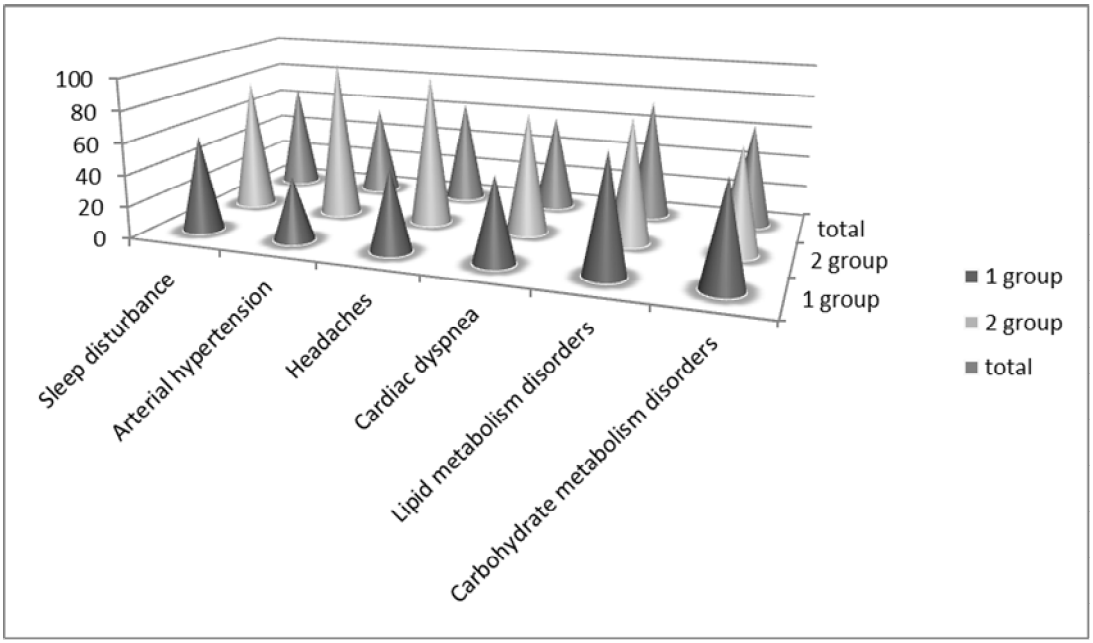

Figure 2. The distribution of positive dynamics of cardio metabolic indicators after the traditional and metabolic treatment of psoriasis.

Increased blood pressure were registered at 107 psoriatic patients before therapy, improvement after treatment were observed in 40.3% of I group patients and in 100% of patients of II group. 120 patients complained of headache, while 51.9% improvement was registered in I group, and 94.9% in II group. We noted the cardiac

dyspnea in 66 psoriatic patients, and registered reducing of this indicator in 55,3 % patients of 1st group and 76,2 % patients of 2nd group. The lipid and carbohydrate metabolism deviations were found in 49 patients 1st group and 46 patients 2nd group. The positive dynamics of these indicators in the 1 group was 73,1 % and 64,5 % respectively, in 2 group – 78,3 % and 66,7 %. The more pronounced improvement of all cardio metabolic indicators was revealed in patients receiving metabolic therapy, particularly improvement of sleep (22,9 %), lowering of the blood pressure (59,7 %), decreasing of headaches (43,0 %) and reducing of dyspnea (22,9 %). The positive dynamics of key parameters of blood, reflecting lipid and carbohydrate metabolism, did not differ significantly between the groups.

Conclusions

Thus, our study have shown comparable efficiency of metabolic and conventional therapy of psoriasis. At the same time, efficiency of correction of cardio metabolic disorders in comorbidity with psoriasis cases, was significantly higher in group treated with metabolic therapy. Using of metabolic therapy of psoriasis combined with cardio metabolic disorders makes possible to avoid medication for cardio metabolic comorbidity correction, or eliminate the use of already assigned symptomatic therapy. This is especially true for the use of antihypertensive drugs, because they are known risk factor for exacerbation of psoriasis and formation of the so-called "drug induced psoriasis".

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Беловол А.Н., Ткаченко С.Г.

Рациональная терапия псориаза, ассоциированного с кардиометаболическими нарушениями

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Резюме. Риск кардиометаболических нарушений у больных псориазом очень высок, что ассоциируется также и с высокой смертностью. Целью данного исследования было изучение коморбидности псориаза и кардиометаболических нарушений для разработки патогенетического лечения и оценки влияния метаболической терапии на дерматологические и кардиометаболические показатели у больных псориазом, ассоциированным с кардиометаболическими нарушениями. Исследование проводили в двух группах больных псориазом. Различные кардиометаболические нарушения были выявлены у 144 пациентов 1 группы и 68 пациентов 2 группы, что составило 78,6 % и 88,5 % соответственно. Пациенты 1 группы (183 исследуемых) получали традиционное лечение псориаза, пациенты 2 группы (78 исследуемых) получали метаболическую терапию. Статистически значимой разницы динамики индексов в процессе лечения псориаза первой и второй групп выявлено не было ($p>0,1$). – 41 % и 44 % соответственно. Более выраженное улучшение по всем кардиометаболическим показателям было выявлено в группе пациентов, получавших метаболическую терапию, особенно улучшение сна (22,9 %), снижение артериального давления (59,7 %), уменьшение головных болей (43,0 %) и одышки (22,9 %). Позитивная динамика по ключевым параметрам крови,

отражающим липидный и углеводный обмен, не отличалась статистически между группами. Использование метаболической терапии псориаза, ассоциированного с кардиометаболическими нарушениями, дает возможность избежать назначения медикаментозной коррекции сопутствующей патологии или сократить уже назначенную симптоматическую терапию.
Ключевые слова: кардиометаболические нарушения, коморбидность, псориаз, терапия.

Біловол А.М., Ткаченко С.Г.

Раціональна терапія псоріазу, асоційованого з кардіометаболічними порушеннями

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Резюме. Ризик кардіометаболічних порушень у хворих на псоріаз є досить високим, що асоціюється також і з високою смертністю. Ціллю даного дослідження було вивчення коморбідності псоріаза та кардіометаболічних порушень для розробки патогенетичного лікування та оцінювання впливу метаболічної терапії на дерматологічні та кардіометаболічні показники у хворих на псоріаз, асоційований з кардіометаболічними порушеннями. Дослідження проводили у двух групах хворих на псоріаз. Різні кардіометаболічні порушення були виявлені у 144 пацієнтів 1 групи та 68 пацієнтів 2 групи, що становило 78,6 % та 88,5 % відповідно. Пацієнти 1 групи (183 хворих) отримали традиційне лікування псоріазу, пацієнти 2 групи (78 хворих) отримали метаболічну терапію. Статистичної різниці динаміки індексів в процесі лікування псоріазу в першій та другій групі виявлено не було (p>0,1). – 41 % и 44 % відповідно. Більш значуще покращення за всіма кардіометаболічними показниками було виявлене в групі пацієнтів, що отримали метаболічну терапію, особливо покращення сну (22,9 %), зниження артеріального тиску (59,7 %), зменшення головного болю (43,0 %) та задишки (22,9 %). Позитивна динаміка за ключовими параметрами крові, що відображують ліпідний та вуглеводний обмін, не відрізнялася статистично між групами. Використання метаболічної терапії псоріазу, асоційованого з кардіометаболічними порушеннями, робить можливим уникнути призначення медикаментозної корекції супутньої патології або скоротити вже призначену симптоматичну терапію.
Ключові слова: кардіометаболічні порушення, коморбідність, псоріаз, терапія.

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FEATURES OF LIPID METABOLISM DISORDERS IN PATIENTS CO-INFECTED WITH HIV/HCV

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Abstract: *The content of lipid metabolism was determined in 107 patients: with chronic hepatitis C - 36 patients, with HIV infection - 35 and co-infection of HIV/HCV – 36 patients. In the investigated patients lipid metabolism disorders were identified such as an increase of the triglycerides, low density lipoprotein, very low density lipoprotein and a reduction of high density lipoprotein contents. Significantly higher levels of triglycerides ($p<0.001$) was observed in patients co-infected with HIV/HCV compared with patients with chronic hepatitis C and HIV-infection. Systematic data analysis suggests that in patients co-infected with HIV/HCV established a strong direct relationship between the level of CD4+ cells and the degree of increase in triglycerides ($r=0,64$, $p<0.001$), atherogenic coefficient ($r=0,57$, $p<0.001$).*

Key words: *chronic hepatitis C, HIV-infection, co-infection HIV/HCV, lipid metabolism.*

Introduction. Ukraine - one of the countries of Europe, leads the unfortunate rating of the number of identified HIV positive and AIDS cases and deaths from the disease [1]. Hepatitis C virus (HCV) and human immunodeficiency virus (HIV) are characterized by their wide distribution and ability to cause health disorders in the working population, thus causing significant morbidity and mortality worldwide. Chronic hepatitis C (CHC) is observed in 60-70% of HIV-infected individuals, due to the common modes of transmission of viruses. Co-infection with HIV/HCV is an important public health problem, since viruses, acting synergistically accelerate the progression of liver disease [2]. HIV accelerates the progression of chronic hepatitis C to cirrhosis and hepatocellular carcinoma, thus increases "liver" mortality.

The literature data about the features of the lipid spectrum of blood on the background of chronic hepatitis C to date are inconsistent. The studies of lipid metabolism in this category of patients have revealed disorders, which are characterized by an increase in triglycerides (TG) and decreased high-density lipoprotein (HDL) in serum [3, 4]. According to the results of another study of blood

lipid metabolism in patients with chronic hepatitis C there is a decrease in total cholesterol (TC), low-density lipoprotein (LDL), elevated levels of triglycerides, very low density lipoproteins (VLDL) and retained unchanged HDL levels [5].

Thus, insufficient knowledge about the impact of HCV on the performance of T-cell immunity in patients co-infected with HIV/HCV proves the feasibility of their comprehensive study in order to identify their interest in the pathogenesis of this disease.

Materials and methods.A study was carried out at the Department of Infectious Diseases of Kharkiv National Medical University, located at the Regional Clinical Hospital of Infectious Diseases of Kharkiv and Kharkiv regional center for prevention and control of AIDS. Features of lipid metabolism were studied in 107 patients: 36 patients with chronic hepatitis C, 35 HIV-infected patients and 36 patients co-infected with HIV/HCV. Age of patients was 20-63 years. The comparison group consisted of 32 healthy subjects who were matched for age and sex with the patients of the studied groups.

The study of lipid metabolism of blood (total cholesterol, triglycerides, HDL, LDL) was carried out by the enzymatically-colorimetric method. A biochemical analyzer BS-300M from the company «Sinnowa» with diagnostic kits from the company "SpaynLab" (Spain). The content of VLDL in blood serum was determined by the formula of A.N.Klimov: VLDL=TG/5, where VLDL - the content of VLDL in blood serum, mmol/l; TG - triglyceride content in blood serum, mmol/l; 5 – calculation factor. Atherogenic coefficient (AC) was calculated by the formula: AC = (TC-HDL) / HDL, where AC - atherogenic coefficient or coefficient; TC - total cholesterol content in blood serum, mmol/l; HDL - HDL cholesterol content in blood serum, mmol/l [6].

Statistical analysis was performed using the software package «Statistica for Windows», 8.0. Methods that were used include: descriptive statistics (numerical description of variables - the arithmetic mean (M), average sampling error (m), definition of the significance of differences (p)), verification by Student t-test, Fisher's representative samples, and the method of correlation of structures [5].

Results. Total cholesterol (TC) in patients of all groups had no significant difference with that of the control group in patients. In the patients studied, compared to the control group, there was a significant increase of triglyceride (TG), atherogenic coefficient (AC), Low density lipoproteins (LDL), Very low density lipoproteins (VLDL) and reduction High-density lipoproteins (HDL). Significantly higher levels of TG ($p<0.001$) was observed in patients co-infected with HIV/HCV compared to patients with chronic hepatitis C and HIV separately.

When the degree of deviation from control values was determined using the analyzed attributes with the help of the normalized index t-test (Fig. 1) it was revealed that Chronic Hepatitis C patients expressed violations regarding the increase in triglycerides ($t=16,7$; $p<0.001$) and AC ($t=10,7$; $p<0.001$), LDL ($t=3,9$; $p<0.001$) and a decrease in HDL ($t=3,5$; $p<0.001$). Minor deviations from the control group include an enhanced VLDL ($t=2,5$; $p<0.05$), and the content of cholesterol were not significantly different from the control group data.

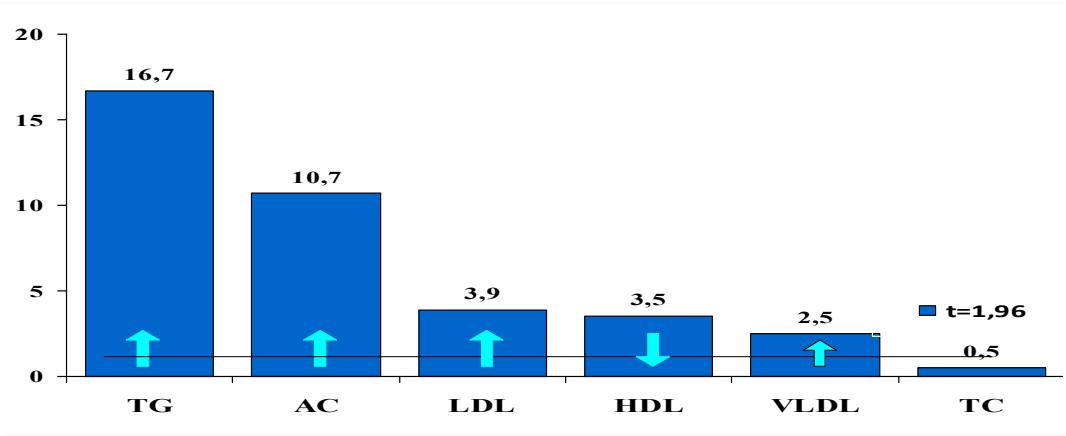

Fig. 1. The degree of deviation from the control indices of lipid metabolism in patients with chronic hepatitis C. ↑ - increase, ↓ - decrease.

In HIV-infected patients, an increase of triglycerides ($t=7,8$; $p<0,001$), VLDL ($t=7,26$; $p<0.001$), LDL ($t=4,42$; $p<0.001$) and AC ($t=3.16$; $p<0.001$). Also a decreased content of HDL ($t=3,25$; $p<0.001$), and cholesterol levels had no significant difference with the control group parameters (Fig. 2).

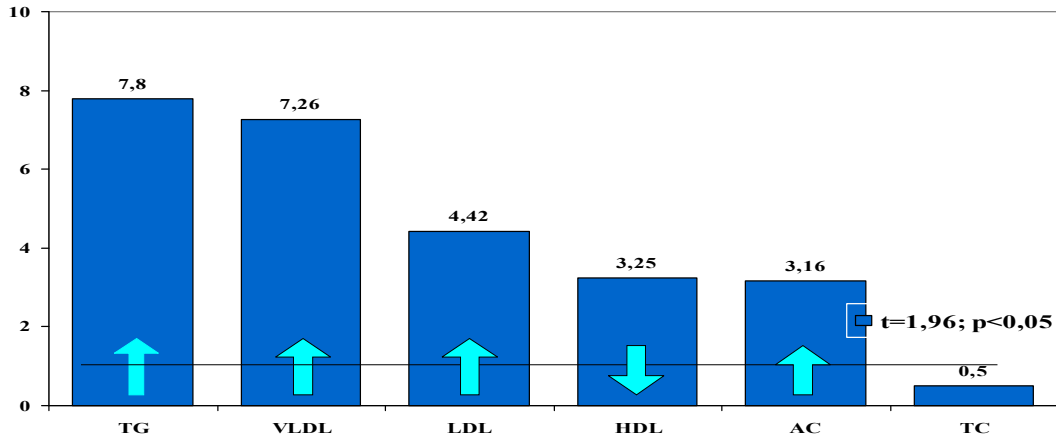

Fig. 2. The degree of deviation from the control indices of lipid metabolism in patients with HIV-infection. ↑ - increase, ↓ - decrease.

In patients co-infected with HIV/HCV significant increases in the amount of triglycerides (t=16,5; p<0.001) and TC (t=7,8; p<0.001) were noted, indicating a high risk of occurrence of cardiovascular disease in these patients. There is an increase in LDL (t=4,81; p<0.001) and VLDL (t=3,36; p<0.001) and a decrease in HDL (t=3,5; p<0.001). The content of cholesterol in patients co-infected with HIV/HCV, had no significant difference with those individuals in the control group (Fig. 3).

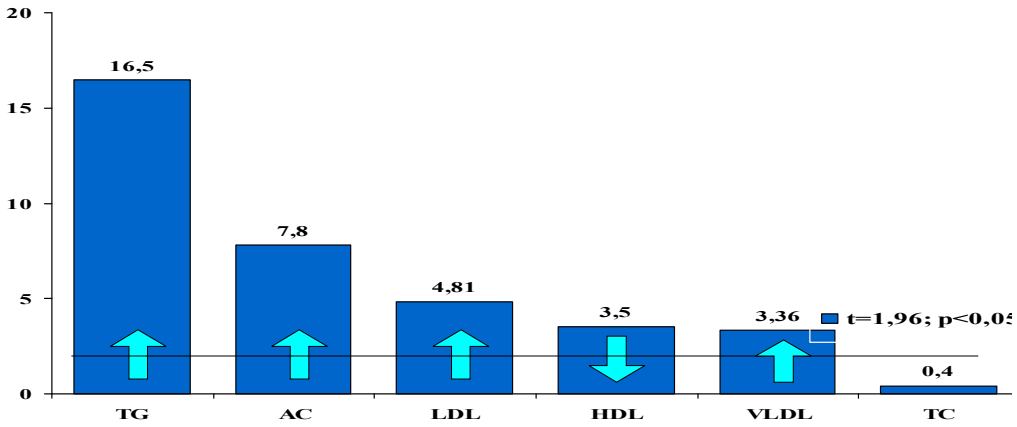

Fig. 3. The degree of deviation from the control indices of lipid metabolism in patients with HIV/HCV co-infection. ↑ - increase, ↓ - decrease.

In carrying out the correlation analysis in patients co-infected with HIV/HCV, a strong direct relationship between the level of CD4+ cells and the degree of increase of TG (r=0,64, p<0.001), AC (r=0,57, p<0.001) was established.

The results obtained reveal a violation of the state of lipid profile in HIV-infected persons with HCV and co-infection with HIV/HCV, which necessitates further study and consideration in monitoring disease and antiretroviral therapy, especially given their lifelong process.

The mathematical expression of the degree of deviation from the control range of the lipid content depending on the kind of pathology, may serve as mean values of the t-test.

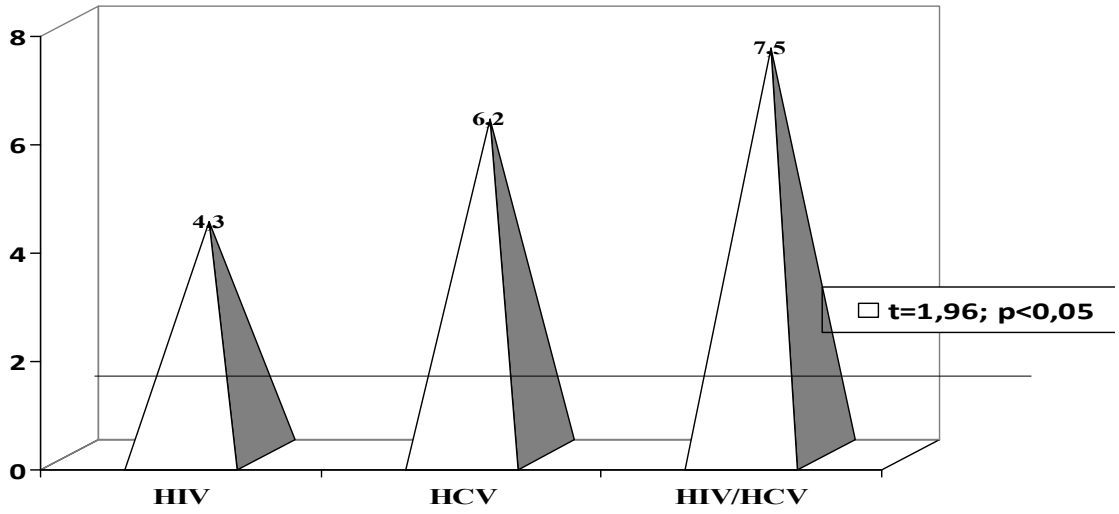

Fig. 4. Integrated assessment of the extent and direction of the deviation from the control of lipid metabolism in groups of patients

The data in Fig. 4 shows that the very pronounced manifestations of disorders of lipid metabolism are characteristic of patients co-infected with HIV/HCV (t=7,5; p<0.001) compared with patients infected with chronic hepatitis C and HIV separately. So, chronic hepatitis C potentiates lipid metabolism in HIV-infected patients.

Conclusions.

The studied patients had lipid metabolism disorders, namely increases in the serum triglycerides, atherogenic coefficient, low-density lipoprotein, very low density

lipoproteins and high-density lipoprotein reduction. Significantly higher triglyceride levels ($p<0.001$) was observed in patients co-infected with HIV/HCV compared to patients with chronic hepatitis C and HIV separately.

In carrying out the correlation analysis in patients co-infected with HIV/HCV, a strong direct relationship between the level of CD4+ cells and the degree of increase of triglycerides ($r=0,64$, $p<0.001$), atherogenic coefficient ($r=0,57$, $p<0.001$) was established.

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Особенности нарушений липидного обмена у больных ко-инфекцией ВИЧ/ХГС

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Резюме. Исследование липидного обмена крови проведено у 107 больных, из них: больных ХГС - 36, ВИЧ-инфекцией - 35, ко-инфекцию ВИЧ/ХГС - 36. У обследованных больных выявлены нарушения липидного спектра, а именно:

повышение в сыворотке крови содержания триглицеридов, липопротеинов низкой плотности, липопротеинов очень низкой плотности, коэффициента атерогенности и снижение липопротеинов высокой плотности. Достоверно более высокий уровень триглицеридов ($p<0,001$) отмечен у больных ко-инфекцией ВИЧ/ХГС по сравнению с больными ХГС и ВИЧ-инфекцией. При проведении корреляционного анализа у больных ко-инфекцией ВИЧ/ХГС установлена сильная прямая связь между уровнем CD4+ клеток и степенью повышения триглицеридов ($r=0,64$, $p<0,001$) и коэффициента атерогенности ($r=0,57$, $p<0,001$).

Ключевые слова: хронический гепатит С, ВИЧ-инфекция, ко-инфекция ВИЧ/ХГС, липидный обмен.

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Особливості порушень ліпідного обміну хворих на ко-інфекцію ВІЛ/ХГС

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Резюме. Дослідження ліпідного обміну крові було проведено у 107 хворих, з них: хворих на ХГС – 36, ВІЛ-інфекцію – 35, ко-інфекцію ВІЛ/ХГС – 36. У досліджених хворих виявлено порушення ліпідного обміну, а саме: підвищення у сироватці крові вмісту тригліцеридів, ліпопротеїнів низької щільності, ліпопротеїнів дуже низької щільності, коефіцієнту атерогенності та зменшення ліпопротеїнів високої щільності. Достовірно більш високий рівень тригліцеридів ($p<0,001$) відзначено у хворих на ко-інфекцію ВІЛ/ХГС порівняно з хворими на ХГС і ВІЛ-інфекцію. При проведенні кореляційного аналізу у хворих на ко-інфекцію ВІЛ/ХГС встановлено потужний прямий зв'язок між рівнем CD4+ клітин і ступенем підвищення тригліцеридів ($r=0,64$, $p<0,001$), коефіцієнту атерогенності ($r=0,57$, $p<0,001$).

Ключові слова: хронічний гепатит С, ВІЛ-інфекція, ко-інфекція ВІЛ/ХГС, ліпідний обмін

Ключові слова: хронічний гепатит С, ВІЛ-інфекція, ко-інфекція ВІЛ/ХГС, ліпідний обмін.

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PATHOGENETIC PECULIARITIES OF DIABETES MELLITUS TYPE 2 AND PSORIASIS

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Abstract. *The article examines some aspects of the pathogenesis of diabetes mellitus (DM) and psoriasis. The author's analysis of literature data has made it possible to reveal a number of common features of these diseases. It is proved that psoriasis patients incur a much higher risk of developing DM type 2. Against a background of DM type 2 the course of psoriasis is, as a rule, more severe. Disruption of the liver enzyme function, breakdown of adaptive mechanisms and the autoimmune component are the common features of pathogenetic mechanisms in these diseases. In DM type 2, particularly at its initial stages, an abundant insulin secretion by pancreatic cells is observed. It is possible that hypersecretion of this hormone develops a higher expression of STAT3 with a resultant acceleration in keratinocyte proliferation. Taking into account that psoriasis is a dermatosis, characterized by an accelerated and distorted hyperproliferation of epidermal cells, it is possible to suppose that, against a background of coexistent DM type 2, the result of an abundant secretion of endogenous insulin is that this hormone acts as an activator of protein kinase C and STAT3. Further studies of separate links in the pathogenesis of these diseases can create necessary prerequisites for understanding mechanisms in the development of this pathology and result in the development of pathogenetically substantiated methods of treatment.*

Key words: *diabetes mellitus type 2, psoriasis, autoimmune processes, epidermal hyperproliferation.*

The study of diabetes mellitus (DM) is one of the most urgent problems in endocrinology. Experts of the World Health Organization define DM as a problem of all ages and all countries. At present, DM takes the third place among immediate causes of death after cardiovascular and oncological diseases [1]. According to literature data, up to 5 % of the world population suffer from DM. Every year the number of patients increases by 5-10 % [2, 3]. The frequent occurrence of DM, its chronic course, severe complications, early disability and high death rate present both a medical and social problem. Therefore in many countries the solution of problems, associated with this disease, is put on the state or federal level [1, 4].

In the opinion of the International Expert Committee on the Diagnosis and Classification of Diabetes Mellitus (1997), DM is a group of metabolic disturbances, which are characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or a combination of both these factors [1]. DM is the syndrome of chronic hyperglycaemia, which develops as a result of the effects of genetic and exogenous factors, is caused by an absolute or relative insulin deficiency in the organism and characterized by disturbances in all kinds of metabolism, first of all the carbohydrate one [2].

Risk factors of the development of DM type 2 are as follows:

1. Abdominal obesity (male-type obesity).
2. Body overweight > 20 % versus the ideal one.
3. Fasting hyperglycaemia (elevation of blood glucose over 5.6 mM/l).
4. Disturbed glucose tolerance.
5. Dyslipidaemia – abnormal values of lipid metabolism:
   - triglycerides > 2.2 mM/l;
   - high-density lipoproteins < 0.8 mM/l.
6. Hereditary loading with DM in first degree relatives [1].

DM type 2 is inherited by one's both mother and father sides. The probability of the disease development is 80 %, if one of the parents is ill with DM type 2, and approaches 100 %, if both parents suffer from this disease [5].

DM may combine with metabolic syndrome, obesity and dyslipidaemia. Liver diseases are one of the most common pathologies in DM. Patients with DM type 2 reveal: disruption of the liver enzyme function, nonalcoholic fatty liver disease, liver cirrhosis, hepatocellular carcinoma, acute hepatic failure. Besides, DM types 1 and 2 may be associated with viral hepatitis [6].

A relative or absolute insulin deficiency in diabetes causes disturbances in the metabolism of glucose, fats and proteins. In DM type 2, chronic hyperglycaemia chiefly results from insulin resistance of target organs. Then it is followed by a progressing decrease of insulin excretion by the pancreas owing to the process of its exhaustion and aging. Diabetes results in involvement of the skin, kidneys, eyes,

cardiovascular and nervous systems [7]. The skin lesion in DM type 2 develops on the basis of disturbances in carbohydrate metabolism and an accumulation of relevant products of the changed metabolism. These processes, in combination with diabetic angiopathies, disorders of local] and general immunity, cause structural changes in the derma, epidermis, follicles and sweat glands [8]. It is not in rare cases that dermatological manifestations can serve as “signal signs” of the disease [9]. At present, more than 30 skin diseases are described, which precede DM type 2 or develop against its background [10, 11].

One of dermatoses, which accompany or precede the development of DM type 2, is psoriasis. During one study, whose purpose consisted in revealing relations between the general state of health and psoriasis, it was found out that female patients with psoriasis were by 63 % more predisposed to develop DM type 2 versus female patients without this dermatosis [12]. Researches, conducted in 2012 in the University of California, revealed that the risk of development of DM type 2 in patients with the moderate degree of psoriasis was 1.5 times higher than in the general population, and in patients with severe forms of psoriasis the above risk was 2 times higher [13].

DM and psoriasis have their common features. Like DM type 2, psoriasis is one of the most widespread, chronic, genetically conditioned diseases of the multifactorial nature. Approximately 2-3 % of the world population suffer from psoriasis, and its share in the total structure of skin diseases ranges within 3-15 %. According to the data of the International Federation of Psoriasis Associations, there are 125 million psoriasis patients in the world. In psoriasis, like in DM, stress is one of the causes, which provoke and aggravate the course of the disease.

At the present level of knowledge, psoriasis can be defined as genotypic dermatosis, transmitted by the dominant type with incomplete penetrance and irregular manifestations. The nature of this disease is multifactorial. Its pathogenic factors include changes in enzyme, lipid as well as, less commonly, protein and carbohydrate metabolisms, endocrine dysfunctions and functional abnormalities of the diencephalon in the form of adaptive disease, shifts in amino acid metabolism,

rather often combined with chronic tonsillitis, influenza and other infectious-allergic diseases (mainly of the strepto-staphylococcal and viral nature). The genetic apparatus of cells can be pathogenically influenced by filterable viruses with resultant violations in the control over biochemical processes. Patients with psoriasis revealed changes in the ratio of fractions of histone proteins, which take an important place in the regulation of proliferative activity and synthesis of DNA, the latter composing the major portion of chromatin [14].

Special genetic studies found out the multifactorial type of psoriasis inheritance with incomplete penetrance of genes. It has been shown that histocompatibility antigens B13 and B17 are found reliably more frequently in psoriasis patients only with skin manifestations, while B17, B27, B33 and B40 are typical for patients with skin manifestations in combination with arthritis. Besides the HLA system, another important genetic marker of psoriasis has been detected: coupling of the dominant forms of psoriasis with the distal part of chromosome 17. In psoriasis, both autosomal dominant inheritance (its probability is up to 50 %) and genetic predisposition to the appearance of the disease under effect of some factors are possible [14, 15]. The probability of this disease in a child is up to 25 %, if one of the parents suffers from psoriasis, and increases up to 75 % in case the disease has affected both parents [15].

As a rule, the course of psoriasis against a background of DM type 2 is more severe. Such forms are observed as exudative psoriasis, psoriatic erythroderma, arthropathic psoriasis, inverse psoriasis. Treatment of psoriasis patients with underlying DM is always difficult, because it is impossible to use photochemotherapy, systemic steroids, etc., in such cases [16]. DM type 2 and psoriasis are often accompanied with obesity, metabolic syndrome, dyslipidaemia, arterial hypertension, diseases of the cardiovascular system [16, 17, 18].

Prevalence of cardiovascular diseases was studied in 130,000 psoriasis patients. The study revealed that in the severe course of dermatosis arterial hypertension was in 20 % of cases (versus 11.9 % in the control group), diabetes mellitus in 7.1 % (versus 3.3 % in the control group), obesity in 20.7 % (versus

13.2 % in the control group), hyperlipidaemia in 6 % (versus 3.3 % in the control group) [19]. In psoriasis, liver pathology is rather often observed. Patients reveal phenomena of cytolysis, cholestasis, hepatocellular insufficiency as well as immune inflammations [20]. Hence liver pathology is one of the common pathogenetic mechanisms in the development of psoriasis and DM type 2 and requires correction with help of hepatoprotectors.

Those patients, who suffer from DM type 2, present complains about excessive dryness of their skin integuments and itching with different degrees of intensity. Also rather important for skin involvement is chronic hyperglycaemia. Disruption of the function and integrity of the epidermal barrier as result of the direct effect of factors of aggression on the epidermis may trigger the mechanism of hyperproliferation [21, 22, 23].

Data about the role of inflammation in the development of diseases are published with an increasing frequency in the recent time. Studies in DM and psoriasis are not exclusion. Autoimmune processes are typical for both diseases. An important part in the development of psoriasis is played by immune disorders: a higher activity of T helpers in case of a defect of T suppressors, an increased content of circulating immune complexes and higher titres of DNA autoantibodies. In psoriasis, cellular infiltrate chiefly consists of CD4+ T lymphocytes. All these data give grounds to regard psoriasis as an immunogenetic disease, where cytokines and growth factors determine the manifestation of inflammation and hyperproliferation caused by a disorder in the system of secondary messengers of cAMP/cGMP. Activated macrophages produce anti-inflammatory cytokines: tumour necrosis factor alpha (TNFα) and gamma (TNF-7), interleukins (IL-1a, IL-2, IL-6, IL-8). A key part is played by TNFα [14].

The role of cytokines in immunoregulation has been studied rather well. A relationship is found out between genetic polymorphism and mutations of cytokine receptors and components of their signal pathways on the one hand and diabetes on the other hand. Mechanisms of signal transduction of types 1 and 2 cytokine superfamilies have been studied. Studies of the signal pathways, switched on by these

receptors, have led to the discovery of the kinase signal transducer pathway (Signal Transducer and Activator of Transcription, STAT), which activates transcription. The STAT family includes seven DNA-binding proteins (STAT1, STAT2, STAT3, STAT4, STAT5a, STAT5b, STAT6). These proteins ensure a rapid transmission of a signal from the membrane to the nucleus for regulation of gene expression. Activated STAT factors participate in the regulation of different cell functions, including immune processes, proliferation, differentiation and apoptosis [24].

Interesting findings were obtained concerning a possible activation of STAT3 under the influence of insulin. The skin is not regarded as a classical tissue, which responds to insulin. Therefore insulin effects in the skin are usually explained by the ability of insulin to activate the heterogenous insulin-like growth factor receptor with a resultant induction of accelerated proliferation and differentiation of keratinocytes [25]. The conducted studies have made it possible to reveal that the transmission of the insulin signal and the stimulation of proliferation of keratinocytes are specifically mediated by protein kinase C (PKC). Insulin regulates phosphorylation, activation and nuclear translocation of STAT3 by specific activation of PKC [26, 27]. The fact that STAT3 knckout mice die at an early stage of their embryonic development demonstrates the vital necessity of this factor for the whole organism, whereas STAT1 knockout only reveals immunosuppression. It is important that biological effects of STAT1 and STAT3 are tissue-specific and can play exactly the opposite role in the proliferation and survival of cells [28].

In DM type 2, particularly at the initial stages of its development, an abundant insulin secretion by pancreatic cells is observed. It is possible that hypersecretion of this hormone develops a higher expression of STAT3 with a resultant acceleration in keratinocyte proliferation. Taking into account that psoriasis is a dermatosis, characterized by an accelerated and distorted hyperproliferation of epidermal cells, it is possible to suppose that, against a background of coexistent DM type 2, the result of an abundant secretion of endogenous insulin is that this hormone acts as an activator of PKC and STAT3 [29].

Our analysis of literature data has made it possible to reveal a number of common features, typical for DM and psoriasis. Further studies of separate links in the pathogenesis of these diseases can create necessary prerequisites for understanding mechanisms in the development of this pathology and result in the development of pathogenetically substantiated methods of treatment.

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Патогенетические особенности сахарного диабета 2 типа и псориаза

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Резюме. В статье рассмотрены некоторые вопросы патогенеза сахарного диабета и псориаза. Проведенный анализ литературных данных позволил выявить ряд общих черт, присущих этим заболеваниям. Доказано, что больные псориазом подвержены гораздо большему риску возникновения СД 2 типа. На фоне СД 2 типа псориаз, как правило, протекает более тяжело. Нарушение ферментообразующей функции печени, срыв адаптационных механизмов, аутоиммунный компонент являются общими чертами патогенетических механизмов при этих заболеваниях. При СД 2 типа, особенно на начальных этапах его развития, наблюдается избыточное выделение инсулина клетками

поджелудочной железы. Возможно, что в результате гиперсекреции этого гормона развивается повышенная экспрессия STAT3, что ведет к ускоренной пролиферации кератиноцитов. Учитывая, что псориаз является дерматозом, характеризующимся ускоренной извращенной гиперпролиферацией клеток эпидермиса, можно предположить, что на фоне сопутствующего СД 2 типа в результате избыточной секреции эндогенного инсулина этот гормон выступает активатором протеинкиназы С и STAT3. Дальнейшее изучение отдельных звеньев патогенеза этих заболеваний может стать предпосылкой для понимания механизмов возникновения этой патологии и привести к разработке патогенетически обусловленных методов лечения.

Ключевые слова: сахарный диабет 2 типа, псориаз, аутоиммунные процессы, гиперпролиферация эпидермиса.

Пустова Н.О.

Патогенетичні особливості цукрового діабету 2 типу і псоріазу

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Резюме. У статті розглянуті деякі питання патогенезу цукрового діабету та псоріазу. Проведений аналіз літературних даних дозволив виявити ряд спільних рис притаманних цим захворюванням. Доведено, що хворі на псоріаз схильні до виникнення ЦД 2 типу. На тлі ЦД 2 типу псоріаз, як правило, протікає більш важко. Порушення ферментоутворюючої функції печінки, зрив адаптаційних механізмів, аутоімунний компонент є загальними рисами патогенетичних механізмів при цих захворюваннях. При ЦД 2 типу, особливо на початкових етапах його розвитку, спостерігається надлишкове виділення інсуліну клітинами підшлункової залози. Можливо, що в результаті гіперсекреції цього гормону розвивається підвищена експресія STAT3, що веде до прискореної проліферації кератиноцитів. Враховуючи, що псоріаз є дерматозом, що характеризується прискореною збоченою гіперпроліферацією клітин епідермісу, можна припустити, що на тлі супутнього ЦД 2 типу в результаті надмірної секреції ендогенного інсуліну цей гормон виступає активатором протеїнкінази С і STAT3. Подальше вивчення окремих ланок патогенезу цих захворювань може стати передумовою для розуміння механізмів виникнення цієї патології і привести до розробки патогенетично обумовлених методів лікування.

Ключові слова: цукровий діабет 2 типу, псоріаз, аутоімунні процеси, гіперпроліферація епідермісу.

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MENTAL CONDITION OF ATHLETES DURING CONTEST SEASON

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***Abstract**. The article describes the causes of stress in terms of competition. Given the recognized foreign scholars stress theory in sport. The possibility of using Copping strategies for coping in the competitive period.*
***Keywords**: stress, sports, competition period.*

Insufficient clarity in terms of the role of intellectual sphere in coping behavior defines relevance of study of mental stylistic features in connection with coping strategies.

Recent decades have shown increasing attention of researchers to the problem of coping behavior in stressful situations within all spheres of human life and activity. This problem is particularly true for athletes whose activity is often associated with stress (extreme) conditions.

In the presence of an increasing number of studies dedicated to the coping problem in stressful situations, experimental data on cognitive mechanisms of coping behavior are very limited. Analysis of domestic works on coping behavior psychology shows that the major part of study is aimed at examination of such coping resources as control locus, social intelligence, self-esteem and self-concept. There are only few works which are devoted to study of the role of mental capacity in coping behavior. We have not found any studies which would investigate relationships of mental stylistic features as cognitive style indicators with aspects of coping behavior in sporting activities.

The objective of psychological support in preparation of athletes is creation of psychological requisites for athletes to acquire optimal prestart state.

Tasks: 1) identification of long-term goals objectively achievable by an athlete on the basis of correlation of goals with his/her capabilities;

2) determination of strengths and weaknesses;

3) identification of short-term and long-term goals;

4) making athletes understand whether his/her behavior and activity bring him/her to the goal.

Stress coping resources of athletes. Fairly recently, researchers dealing with problems of coping strategies (essence of the term "coping" lies in effective adaptation of a person to situation requirements) when considering coping have started following the so-called "resource-based approach". The resource-based approach focuses on the fact that there is a process of "resource allocation" which explains why some people manage to preserve health and adapt despite different life circumstances.

A number of reliable researchers whose works have not been connected with coping behavior study are referred to the resource-based approach. The resource-based approach considers a wide variety of different resources, both environmental (availability of instrumental, moral and emotional support from the social environment) and personal (individual skills and capabilities) ones. According to the Hobhole theory, there are two resource classes: material and social, or those associated with values.

By developing ideas of various authors on multiplicity and allocation of resources which participate in activity control, V. A. Bodrov presented several postulates in the human resource concept.

- the "human system" at any moment of time has a certain number of capabilities for conversion of energy and information which are called resources;

- activity is characterized by the quantity of applied resources and efficiency of their application;

- the task at the given point of time is defined for a certain person by a variety of informational (quality and quantity of incentives, coding, placement etc.) and personal (capability, difficulties, significance etc.) parameters, correlation of which defines availability of resources in the present activity;

- the activity function is characterized by relationship of operative information quality (as a result of correlation of task performance conditions and individual capability) and resource amount.

The problem of psychological stress from the point of the resource-based approach is reflected in its resource-based model, in accordance with which stress appears as a result of real or imaginary loss of a part of resources which include behavioral performance, physical, mental and professional capabilities, personal attributes, autonomic and metabolic processes. G. V. Lozhkin presents the same idea of interrelation of stress and resources and states that stress reflects the character of relation between requirements of sporting activity and amount of resources for their satisfaction.

In the stress resource-based model, the possibility to evaluate stress through the category of resource loss and consumption seems attractive. However, it is still unclear, to what extent differences in stressful situations reflect on composition and amount of required resources, how this process is influenced by initial significance of a resource, whether resource reallocation effects exist in real and what they involve.

Issues of essence of resource consumption processes, specificity of resources, individual differences in intensity of consumption in the similar situation, change of resource consumption in different situations etc. appear when analyzing positions of the stress resource-based theory.

Efficient stress coping is ensured by creative, rational use of available resources and estimated in terms of the following indicators: efficiency of energy and resource consumption, efficiency in achievement of the desired goal to resist stress and recover functional balance of organism and mind, personal development as increase of capability, self-respect and well-being. Thus, successful stress coping helps to obtain short-term and long-term benefits and advantages.

All resources in accordance with their role in control of stress coping processes may be divided into several types:

Personal resources include traits and attitudes which are useful for control of behavior in different stressful situations. The most significant ones involve self-control, self-esteem, self-regard etc.

Psychological resources are determined by psychomotor, emotional, volitional and other capabilities of a person to solve the problem or control emotions.

Professional resources are the required level of knowledge, skills, competencies and experience for solution of tasks in a difficult situation.

Social resources of stress coping reflect the level of social and material support, life values, self-regard, confidence control and interpersonal relations etc.

Physical resources reflect the state of physical and mental health, functional reserves of the organism.

Material resources are determined by the level of financial, residential and other support.

The set of personal, psychological, professional and physical resources comprises the uniform individual resource of a person.

Personal resources of coping are the complex set of personal and relational factors which provide a part of psychological context of coping. Personal resources are relatively stable characteristics which have impact on selection of estimation and coping processes, and in their turn may be influenced by the most important results of these processes in action.

Self-worth, optimism and sense of connection with the world. People who prize their self-worth in critical situations show performance and quietness. Those who are unconfident, who underestimate their personal qualities, tend to avoid such situations.

Optimism as common expectation of a positive result. Optimism is associated with success in physiological and psychological adaptation to stressful situations, possibly because optimists are prone to focus on the problem, see into it and thus search for real ways of coping, rather than avoid problem situations using different defense mechanisms, such as negation or emotional expression. An optimist hopes for the best outcome of the situation for him.

Such a personality trait as self-respect is associated with self-efficacy to some extent. It has been found that people successfully resisting stress have more implicit self-regard.

The risk factor which is considered both as the aspect of a difficult situation and personality trait plays a significant role in development of stress and nature of coping with it, especially in dangerous, harmful types of activity which require responsibility. It is shown in studies of E. N. Kiryanova that capability to act in risk conditions depends on personal appetite and readiness for risk. Manifestation of these personal qualities depends on the level of intensity - extremeness, anxiety and other qualities which characterize personal resource of an acting party.

Therefore, it may be said the personal resources, degree of their performance depend on impact aspects of internal and external life and activity factors.

Sports as a stressful activity type. In the modern sports, requirements to sporting activity, sportsmanship level, an athlete as such are very high. During workouts and especially contests, athletes have to show great and ultimate strain of their force and capabilities. Besides, the more the level and scale of contests, the more the degree of psychological strain.

As a matter of fact, study of psychological strain (stress) in sporting activity was started in 40-50-s of the 20th century, when different forms of athlete prestart state were found and described, and their impact on athlete behavior and activity under conditions of contests was revealed.

For a long time many stress researchers considered physiological stain as the main and only stressor in sports. In fact, mental factors in sports were the strongest stressors. That is why stress degree should be estimated on the basis of complex and simultaneous study of psychic and physiological components.

Stress in sporting activity is caused by both physiological and psychological stressors. The human organism when responding to stress impact does not delimit stressors. Sport situations cause both psychic and physiological stress.

In opinion of some researchers, a sports contest situation is stressful mainly because there is significant discrepancy between which tasks are set for an athlete in

these contests and which capabilities for their realization he has currently. Tasks exceeding athlete's capabilities are the main reason for stress during contests. Moreover, not simply objective difficulty of a solved task, but rather probabilistic assessment of possibility of its execution by an athlete is the main reason for strain.

Among other factors which give rise to psychic stress in a sports contest situation, one emphasizes objective difficulty of an activity, overstrain of physical and physiological functions, appearance of negative emotional experience. There are social and psychological reasons for stress under conditions of sports contests of different levels:

1) inadequate interpersonal relations in collective activity, e.g., in collective play activity;

2) disturbance of functional relations within the sports team;

3) hard management by the trainer;

4) microsocial environmental situational effects.

There is no uniform stress theory either in general or sport psychology.

American experts in the field of sport and exercise psychology R. S. Weinberg and D. Gould consider several stress theories in sports: drive; inverted U; zones of optimal functioning; catastrophes and reversal theories.

Drive theory. According to the drive theory, with increase of anxiety or agitation state of a person, his/her physical activity level increases as well: the more agitated an athlete becomes, the better he/she performs.

In accordance with the social facilitation theory – a form of the drive theory, presence of other people facilitates execution of simple or well learnt tasks and has negative impact on execution of complicated or poorly learnt ones.

Inverted U hypothesis. According to this hypothesis, in case of low agitation levels, indicators of physical activity will be lower. With increase of the agitation level, the physical activity level will increase as well – up to a certain optimal extent which is characterized by the highest results. Further agitation increase leads to reduction of the physical activity level. So, this hypothesis is represented by the

inverted U which reflects the high physical activity level at the optimal agitation level and reduced physical activity level at lower or very high agitation degree.

It should be noted that as in case with general psychology, terms “stress” and “psychic strain” in sport psychology are typically considered as synonyms.

The most important methodological principle for explanation of psychic phenomena is analysis through activity. Characterizing sporting activity and marking its specifics, A. Ts. Puni points out its extreme nature in the first place. “Extremeness of activity conditions is a characteristic feature of modern sports, culmination wherein lies the contest rich with intense struggle for achievement of victory over a contestant”.

So, the key feature of sporting activity is regular high-degree mental strain. This strain is conditioned by participation in sports contests which are usually rich with struggle of equal contestants and always require maximum strain of all spiritual and physical strengths of an athlete.

All scientists working in the field of psychology, physical education and sports point at extreme nature of sporting activity, especially in its key link – contest.

What are key features of modern sports which determine its stressful nature and have essential impact on athlete’s mind?

The following aspects are characteristic for contest activity:

- publicity with all resulting consequences (estimation by viewers, mass media etc.);

- its significance for an athlete, because he/she strives either for victory, record or accomplishment of a category or a qualifying standard;

- limitation of a number of qualification trials, that is why there is often no possibility to correct faulty actions or performance;

- limitation of time during which an athlete may estimate a possible contest situation and make an independent decision;

- strangeness of conditions of its performance when changing contest sites: climatic, time, weather differences, new sports equipment, gyms and athletic grounds.

All this leads to appearance of mental tension state of an athlete which does not usually happen during workouts.

Thus, modern sports are activity, mainly under conditions of strongly marked stress, especially if it is executed on the level of large-scale contests.

Numerous studies show that negative forms of prestart states not only cause clearly experienced mental discomfort, but also have an adverse impact on readiness for sport struggle and contest result. For instance, A. Ts. Puni points out negative impact of these mental states on memory, attention and thinking processes. O.A. Chernikova states that they affect athlete's behavior, appropriateness of his/her actions, reduce performance, deteriorate speed and precision in movement, reduce activity and are destructive for shape. Yu. Ya. Kiselev draws attention to negative effect of emotional states, information receipt and organization processes.

In conclusion, sports contests on all its levels (from junior and youth to top-class sports) this is mainly stressful activity with high responsibility.

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Вишня Е.В., Пройдаков С.О., Карлашов С.В.

Психологическое состояние спортсменов в соревновательный период

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Резюме. В статье показаны причины возникновения стресса в условиях соревнований. Приведены признанные зарубежными учеными теории стресса в спорте. Показаны возможности использования коппинг-стратегий для преодоления стресса в соревновательном периоде.

Ключевые слова: стресс, спорт, соревновательный период.

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Психологічний стан спортсменів у змагальному періоді

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Резюме. У статті наведено причини виникнення стресу в умовах змагань. Приведено теорії стресу у спорті, які визнано закордонними вченими. Показано можливість використання копінг-стратегій для подолання стресу у змагальному періоді.

Ключьові слова: стрес, спорт, змагальний період.

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PEDIATRICS

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COMPARATIVE ANALYSIS OF THE ROLE OF DOMESTIC ALLERGENS IN ATOPIC DERMATITIS ETIOLOGY IN CHILDREN

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Abstract. *Four hundred and thirty-eight children aged 4 to 18 suffering from atopic dermatitis in the sustained remission phase in the course of the disease were studied using the skin prick testing technique. Prevalence of children of pre-school and primary school age with the atopic dermatitis was established. Skin acariasis caused by Dermatophagoides farinae mites prevails which can be used to optimize specific immunotherapy of atopic of dermatitis in children. Children of the senior school age were the least sensitive to A. Daphnia magna. Suitability of the start elimination therapy was proved. The detected age and sex etiological features of (atopic dermatitis) AD in the large population of children related mostly to the prevailing role of domestic triggers suggest the urgent necessity to eliminate the allergens in the residential premises where children suffering from allergic diseases live, as well as in the places where healthy children live, since the long contact with the indoor allergens is potentially hazardous regarding sensitization formation.*

Keywords*: atopic dermatitis, domestic allergens, children.*

One of the leading causes of atopic dermatitis (AD) in children is sensitizing to different domestic allergens. The findings of multiple studies prove that contacting with different allergens contained in the house dust is the most important factor inducing the onset of bronchial asthma. The role of domestic allergens in development of allergic rhinitis, as well as atopic dermatitis and allergic urticaria was also very important [1-5].

Most authors [6-8] note that allergenic aggressiveness of house dust depends primarily on the number and kinds of mites inhabiting it which belong, generally, to *Dermatophagoides* genus of *Pyroglyphidae* family, among them *Allergenum e pulvere domesticum e Dermatophagoides pteronyssinus*, *Allergenum e pulvere domesticum e Dermatophagoides farinae*, *Allergenum e pulvere domesticum ex Acarus siro*. Besides, domestic allergens include *Allergenum e pulvere bibliothecae*, *Allergenum e pluma pulvini*, and *Allergenum e Daphnia magna*.

Aims and purposes. The aim of study was the specification of casually significant allergen depending on sex and age. We set the problem to make a

comparative assessment of the significance of home aeroallergens in etiologic spectrum of atopic dermatitis in children according to age and gender by prick-test in the period of stable remission of the disease.

Materials and Methods. We observed 438 children with atopic dermatitis aged 4 to 18 years. Depending on the age the patients were divided into three groups: Group 1 at the age of 4-8 year old, Group 2 - 9-12 year old, 3 group - 13-18 years old, allergological testing is done by skin prick test.

The objective of the study was comparative assessment of the significance of home aeroallergens in etiology of atopic dermatitis in children. We observed 438 children aged 4 to 18 with atopic dermatitis. The work is implemented in regional children's allergy center based in Regional children's clinical hospital #1 in Kharkov.

Skin testing with allergens has been a valuable method of allergy testing. The objective of tests is confirming the role of allergens in the development of the disease, which suggestive of hypersensitivity according to anamnesis. This is a highly sensitive method enabling to determine specific sensitization by percutaneous allergen injecting and evaluation of the magnitude and nature of the urtica or inflammatory reaction. Testing can be performed using scratch test, injection test, prick test, and the intradermal test techniques. We have performed allergy prick testing used to discover I type reactions.

The indications for skin testing with allergens were clinical anamnesis, the data of clinical, and laboratory examinations.

Standard serial allergens containing 10,000 PNU in 1 ml made of pollen, house dust, wool, food etc. were used for skin testing (producer LRS Immunolog, 21036, Vinnica, P.O.B. 4283, Zbyzhka street, 5). The principle of skin testing is based on the fact that the allergen applied to the skin interacts with Langerhans cells and macrophages. In case of sensitization, such interaction results in releasing of allergic mediators and in the development of a local allergic reaction.

Assessment of skin test results. The skin test results are assessed in 15 to 20 minutes (immediate reaction). The reaction is assessed according to the pattern in Table # 1 below. Skin reaction to histamine should be positive, in case of negative reaction allergen test should be made. Skin reaction to test control fluid should be negative, in case of positive reaction the allergen tests should be considered [9].

Table 1

Skin test assessment pattern

Allergic reaction types	**Prick testing**	
	Papule size, mm	Legend
Negative	0	-
Slightly positive	1-2	+
Positive	3-7	++
Strong positive	8-12	+++
Hyperergic	13 and over	++++

We analyzed the test results by the degree of manifestation of skin reaction to the specific allergen to determine the most probable allergens in case of onset or exacerbation of atopic dermatitis in children. The range of allergic reactions from (++) to (+ + + +) was considered causally significant in the etiologic spectrum of the disease. Results of testing are processed by a method of the mathematical analysis, raised in nomograms according to which, considering the nosological entity of disease, sex and age of patient, it's defined causally significant allergen.

According to Table 2, the number of children suffering from AD, prevails significantly in pre-school and early school age, with advancing age the number of children with AD decreases which is statistically significant (P<0.05).

Table 2

The results of the observations. Allocation of patients depending on sex and age

Parameter	Age (years)						Total
	4–8		9–12		13–18		
	B	G	B	G	B	G	
abs.	n=111	n=139	n=49	n=41	n=73	n=25	438
p%±$s_{p\%}$	25.3±2.1	31.7±2.2	11.2±1.5	9.4±1.39	16.7±1.7	5.7±1.1	
P	P >0.05		P >0.05		P >0.05		
abs.	251		90		98		
p%±$s_{p\%}$	57.3±2.3		20.5±1.9		22.4±1.9		
P	$P_{(4-8)/(9-12)}$ >0.05; $P_{(4-8)/(13-18)}$ <0.05; $p_{(9-12)/(13-18)}$ >0.05						

The findings of the study suggest that domestic allergens play an important role in the etiological spectrum of AD in children. *Dermatophagoides farina* which causes hyperergic skin reactions in boys of all age groups and in pubertal girls should be considered causally significant for occurrence of atopic dermatitis in children among the domestic triggers, children aged 9-12 and 13-18 have minimal reaction to other domestic allergens, however, hyperergic skin reactions occur in children aged 4 to 8 years, especially boys, for all domestic allergens.

Such an immunopathologic situation facilitates development of a preparation for the specific immunotherapy (ASIT) for children suffering from AD aged 9 to 12 and 13 to 18. Development of an effective monovalent vaccine for children aged 4 to 8 would be difficult due to polyvalent property of the domestic allergy.

Hyperergic reactions to daphnia allergens occurred primarily in boys aged 4 to 8 years, less frequently in girls aged 4 to 8 years. Daphnia allergens are not causally significant for children of the elder age groups (Table 3 to 6).

The detected age and sex etiological features of AD in the large population of children related mostly to the prevailing role of domestic triggers suggest the urgent necessity to eliminate the allergens in the residential premises where children suffering from allergic diseases live, as well as in the places where healthy children live, since the long contact with the indoor allergens is potentially hazardous regarding sensitization formation.

Table 3

Allergy reaction grade during testing of children suffering from AD with domestic allergens (absolute measures)

Allergens	Atopic dermatitis																			
	Age (years)																			
	4-8								9-12								13-18			
	boys (n-111)				girls (n-139)				boys (n-49)				girls (n-41)				boys (n-73)				girls (n-25)			
Allergy grade	1+	2+	3+	4+	1+	2+	3+	4+	1+	2+	3+	4+	1+	2+	3+	4+	1+	2+	3+	4+	1+	2+	3+	4+
	1				2				3				4				5				6			
A.D. pteroniss imus	7	17	7	2	21	17	3	0	5	5	1	0	6	2	0	0	9	6	2	0	2	0	0	0
A.D. farina	17	14	10	22	39	18	2	0	18	3	19	0	8	5	1	0	20	13	22	16	11	0	13	0
A.P. bibliothe cae	8	14	10	1	21	15	4	0	5	5	0	0	4	3	1	0	7	6	5	0	2	0	0	0
A.D. Acarus siro	6	14	8	5	22	14	3	0	6	4	1	0	3	3	2	0	6	6	6	1	2	0	0	0
A.P. pulvini	4	18	7	4	24	11	4	0	8	3	0	0	6	1	1	0	9	5	2	0	2	1	0	0
A. Daphnia magna	9	11	8	6	24	14	2	0	5	5	0	0	7	1	0	0	8	7	1	0	2	0	0	0

In this regard the use of available highly sensitive specific method of detection of allergic pathology, reduction of invasive method of research in children and simultaneous search for techniques prior in social and economic aspects for the purpose of well-timed correction and prevention of these conditions and having good prospects.

Table 4. **Allergy reaction rate during testing of children suffering from AD with domestic allergens aged 4 to 8 years,** ($p\%\pm s_{p\%}$)**.**

Sex	**Boys (n=111)**				**Girls (n=139)**			
Allergy grade	1+	2+	3+	4+	1+	2+	3+	4+
Allergens	($p\%\pm s_{p\%}$)				($p\%\pm s_{p\%}$)			
A.D. pteronissimus	6.3±2.3	15.3±3.4	6.3±2.3	1.8±1.2	15.1±3.0	12.2±2.7	2.2±1.2	0
A.D. farina	15.3±3.4	12.6±3.1	9±2.7	19.8±3.7	28.1±3.8	12.9±2.8	1,4±0.9	0
A.P. bibliothecae	7.2±2.4	12.6±3.1	9±2.7	0.9±0.8	15.1±3.0	10.8±2.6	2.9±1.4	0
A.D. Acarus siro	5.4±2.1	12.6±3.1	7.2±2.5	4.5±1.9	15.8±3.1	10.1±2.5	2.2±1.2	0
A.P. pulvini	3.6±1.7	16.2±3.5	6.3±2.3	3.6±1.7	17.3±3,2	7.9±2.3	2.9±1.4	0
A. Daphnia magna	8.1±2.5	9.9±2.8	7.2±2.5	5.4±2.1	17.3±3.2	10.1±2.5	1.4±0.9	0

Table 5. **Allergy reaction rate during testing of children suffering from AD with domestic allergens aged 9 to 12 years,** ($p\%\pm s_{p\%}$)**.**

Sex	**Boys (n=49)**				**Girls (n=41)**			
Allergy grade	1+	2+	3+	4+	1+	2+	3+	4+
Allergens	($p\%\pm s_{p\%}$)				($p\%\pm s_{p\%}$)			
A.D. pteronissimus	10.2±4.3	10.2±4.3	2±2	0	14.6±5.5	4.9±3.3	0	0
A.D. farina	36.7±6.8	6.1±3.4	38.8±6.9	0	19.5±8.2	12.2±5.1	2.4±2.4	0
A.P. bibliothecae	10.2±4.3	10.2±4.3	0	0	9.8±4.6	7.3±4.6	2.4±2.4	0
A.D. Acarus siro	12.2±4.6	8.2±3.9	2±2.0	0	7.3±4.1	7.3±4.1	4.9±3.4	2.4±2.4
A.P. pulvini	16.3±5.2	6.1±3.4	0	0	14.6±5.5	2.4±2.4	2.4±2.4	0
A. Daphnia magna	10.2±4.3	10.2±4.3	0	0	17.1±5.8	2.4±2.4	0	0

Table 6. **Allergy reaction rate during testing of children suffering from AD with domestic allergens aged 13 to 18 years,** ($p\%\pm s_{p\%}$)**.**

Sex	**Boys (n=73)**				**Girls (n=25)**			
Allergy grade	1+	2+	3+	4+	1+	2+	3+	4+
Allergens	($p\%\pm s_{p\%}$)				($p\%\pm s_{p\%}$)			
A.D. pteronissimus	12.3±3.8	8.2±3.2	2.7±1.8	0	8±5.4	0	0	0
A.D. farina	27.4±5.2	17.8±4.5	30.1±5.4	21.9±4.8	44±9.9	0	52±9.9	0
A.P. bibliothecae	9.6±3.4	8.2±3.2	6.8±2.9	0	8±5.4	0	0	0
A.D. Acarus siro	8.2±3.2	8.2±3.2	8.2±3.2	1.4±1.4	8±5.4	0	0	0
A.P. pulvini	12.3±3.8	6.8±2.9	2.7±1.8	0	8±5.4	4±3.9	0	0
A. Daphnia magna	11±3.6	9.6±3.4	1.4±1.4	0	8±5.4	0	0	0

Conclusions.

1. The performed study allowed establishing the causally significant allergen from house dust causing atopic dermatitis in children of the certain age and sex group.

2. Prevailing positive reactions in children suffering from atopic dermatitis to A.D. farina enables to develop a preparation for the specific immunotherapy.

3. The obtained negative testing results with allergens from daphniae in most children with AD aged 9 to 12 and 13 to 18 enable to exclude this allergen from the etiological spectrum of atopic dermatitis in children of the above age group.

4. In view of the polyvalent antigen composition of indoor allergens at home, the initial elimination of triggers from the environment of children with atopic dermatitis should be considered most effective.

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Порівняльна характеристика значущості побутових алергенів в етіології атопічного дерматиту у дітей.

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Резюме. Методом prick-test обстежено 438 дітей віком від 4 до 18 років, хворих на атопічний дерматит у період стійкої ремісії встановлено перевагу у захворюваності атопічним дерматитом серед дітей дошкільного та раннього шкільного віку. Серед шкірних акаріазів превалюютьвикликані кліщами роду Dermatophagoides farina, що може бути використано з метою оптимізації специфічної імунотерапії атопічного дерматиту у дітей. Діти старшого шкільного віку найменш чутливі до A.Daphnia magna. Доказана доцільність стартової елімінаційної терапії.

Ключові слова: атопічний дерматит, побутові алергени, діти.

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Сравнительная характеристика значимости бытовых аллергенов в этиологии атопического дерматита у детей.

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Резюме. Методом prick-test обследовано 438 детей в возрасте от 4 до 18 лет, больных атопическим дерматитом в фазе стойкой ремиссии в течении заболевания. Установлено преобладание в заболеваемости атопическим дерматитом детей дошкольного и раннего школьного возраста. Среди кожных акориазов преобладают вызванные клещами рода Dermatophagoides farina, что может быть использовано с целью оптимизации специфической иммунотерапии атопического дерматита у детей. Дети старшего школьного возраста наименее чувствительны к A.Daphnia magna. Доказана необходимость в стартовой элиминационной терапии.

Ключевые слова: атопический дерматит, бытовые аллергены, дети.

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CHARACTERISTIC FEATURES IN THE SYSTEM OF HEMOSTASIS OF PATIENTS WITH ABNORMAL UTERINE BLEEDING AT PUBERTY

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Abstract. *The article is aimed at clarifying the features of the hemostasis system in patients with abnormal uterine bleeding (AUB) in adolescence. The features of the state of the blood coagulation system in patients with AUB which are not connected with blood diseases were identify. It was found that only in a small number of patients abnormalities in the hemostatic system do not detected. Most patients have defects in coagulation and anticoagulation systems.The greatest changes occur at the II and III phases of hemostasis. Some features, characteristic of patients from different clinical groups: dependence on the duration, the presence of concomitant somatic pathology, and the level of estrogen intenseness have been revealed in the study. With the rise in the bleeding duration the number of patients with hypercoagulation manifestations in the hemostatic system also increases. In adolescents with concomitant somatic pathology and hyperestrogenemia manifestations of increased blood coagulation have been registered more often already at the first phase of the coagulation process.*

Keywords: *abnormal uterine bleeding, adolescent girls, the system of hemostasis.*

Background and aims. The importance of health care problems concerning reproductive potential of children and adolescents as well as prevention and treatment of gynecological diseases in childhood does not lose its topicality, but it increases to a great extent. Abnormal uterine bleeding (AUB) is one of the most common gynecological diseases in adolescence, ranging from 20% to 45% of all gynecological pathologies [1,2,3]. Despite along-term period of studying the problem of UB in adolescent girls remains urgent and attracts attention of not only pediatric gynecologists, but of some other specialists as well. The study of uterine bleeding is not possible without considering the peculiarities in the state of blood coagulation system. Blood coagulation is an important protective mechanism, and its disorders can lead not only to severe health states, but even to the fatal outcome. In some cases,

hemostatic dysfunction is the first cause in the development of UB, in others it is a component of the general pathological process [4,5,6,7]. The data of special literature, describing the states of coagulation and anticoagulation systems of blood in adolescents with abnormal uterine bleeding (AUB), are controversial [8,9].

This study was designed to examine the state of peripheral blood in girls and teen-agers with abnormal uterine bleeding at puberty.

Materials and methods.

A clinical and hemostasiologic study was carried out in 182 patients, aged 11-18, who were treated for AUB.

Depending on the clinical course of the disease, our patients were divided into 3 groups. Gr.I included 81 girls with the first episode of bleeding, gr.II consisted of 31 adolescents with a remittent bleeding type (long-term, scanty bleeding with short "light" intervals), and 70 girls with a recurrent course of the disease constituted group III. Patients with verified diagnoses of blood diseases were not included in the study.

The state of the coagulation system was judged by determining the number of platelets, fibrinogen and fibrinogen B levels, plasma recalcification time, prothrombin index, and blood fibrinolytic activity.

Statistical processing of the results obtained was carried out using the statistics “Microsoft”, “StatgraphicPlus 3.0” and “SPSS Statistics 17.0” software packages. The reliability of distinctions between the parameters compared was assessed with Student’s **t**, Wilcoxon –Mann-Whitney **u**, and Fisher’s F- tests, as well as with χ^2.

All medical measures were performed in correspondence with the time-limit of examination of our patients on receipt of the informed consents. The data are saved in the case histories and in the computer database. The study participants and their parents are given out health medical records in accordance with the results of examination.

Results and discussion. We have analyzed the number of platelets in the peripheral blood of our patients, taking into account that in the study of blood coagulation system special attention is paid to thrombocytopoiesis, as platelets are the main supplier of thromboplastin which starts the process of blood coagulation. It

turned out that a serious thrombocytopenia (less than130 -150 * 109 / L) was not observed in our patients. A decreased number of thrombocytes (less than 180 * 109 / L) was revealed in almost 13% of the patients, and in patients with a remittent type of bleeding it occurred less often. Hemocoagulation or conditionally enzymatic blood coagulation process can be divided into three stages:1 - thromboplastin formation, 2 - thrombin formation, and 3-fibrin formation (Table 1).All these stages are closely connected.

Table 1.

Mean values of some in the system of homeostasis in adolescent girls with AUB

Blood parameters	Statistical index	Gr. I n=81	Gr. II n=31	Gr. III n=70	All patients n=182
Plasma recalcification, sec	M±SD Me	132,81± 48,37 125	131,52± 37,06 130	134,32± 41,44 127	133,17± 43,92 125
Prothrombin index, %	M±SD Me	101,24± 12,45 100	99,05± 14,06 95,0	98,85± 11,49 95,0	99,99± 12,35 100
Fibrinogen, g/L	M±SD Me	3,64± 1,87 3,1	3,13± 1,22 2,8	3,54± 1,60 2,9	3,52± 1,69 2.95
Fibrinolytic activity, sec	M±SD Me	251,67± 49,02 240,0	251,19± 43,51 242,5	245,0± 56,94 240,0	248,72± 51,12 240,0
Plasma tolerance to heparin, min	M±SD Me	7,78± 2,59 7,16	7,65± 2,2 7,0	7,72± 2,67 7,0	7,74± 2,55 7,0

The rate of thromboplastin complex formation can be judged by plasma recalcification time. The findings of the current study show that in all three groups most patients had disorders in thrombopastin complex formation (gr.I –72.0%; gr. II – 63.3%; and gr.III– 68.5%). Such disorders take place mainly due to an increased time of recalcification, indicating a slowdown of the blood coagulation process (Fig.1). At the second phase of hemostasis formation of an active proteolytic enzyme thrombin occurs from its inactive precursor prothrombin. In more than half of girls of all three groups prothrombin index was within the bounds of normative values (gr. I – 54.9%; gr. II – 46.7%; and gr.III– 52.1 %). An increase in this index has been registered almost in a third of our patients (gr. I – 37.8%; gr. II – 33.3%; and gr.III–

29.6 %) which testifies to a rise in blood coagulation properties, that is procoagulant effect.

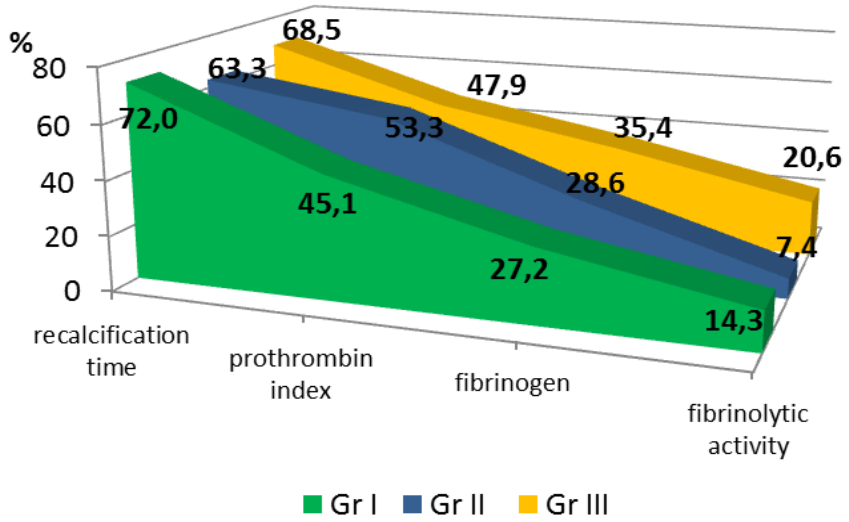

Fig.1. Proportion of patients with hemostatic defect

Moreover, in the overwhelming majority of patients a rise in prothrombin index occurs against an increased recalcification time, i.e. this process can be considered as a compensatory, adaptive response of the organism to the previous decrease in blood coagulation properties. It is well-known that platelet aggregation activity is dependent to some extent on blood fibrinogen concentration. In most patients it was within the physiological range. An increase in this parameter has been registered in 27.2 % (gr.I); 28.6% (gr.II); and 35.4% of the girls from gr.III, which is significantly more often than in gr.I and gr.II($p < 0.05$). In adolescents of these three groups fibrinogen B presence has been observed more frequently(gr.I– 51.8%, gr. II – 53.3%, and gr. III– 63.4%; $p_{1,2}<0.01$).The final stage of the hemostatic system functioning is fibrinolysis. In the period of bleeding fibrinolytic activity disorders have been registered in 14.3 % of the girls from gr. I, in 7.4 %from gr. II, and in 20.6%of patients from gr.III. Moreover, both inhibition of fibrinolysis and its activation took place in patients from gr. II and gr.III. Inhibition of fibrinolytic activity was prevailing (10.4 vs. 3.9 %, respectively, $p < 0.001$)in the girls from gr. I.

An increased fibrinolysis was recorded more often in the teenagers from gr.III. (9.5 vs. 3.9 % in gr.Iand3.7 % in gr. II, $p_{1.2}<0.01$).

With an increase in the duration of UB the number of adolescent girls with disorders in hemostasis grows significantly. The percentage of adolescents with normal prothrombin index and fibrinolytic activity findings reduces. The presence of extragenital pathology also affects the blood coagulation system: proportion of patients with manifestations of hypertcoagulation increases. Similar changes take place in UB on the background of hyperestrogenia.

Thus, we can make a conclusion about inappropriate dynamic equilibrium in the system of hemostasis in girls with AUB. The greatest changes occur at theII and III phases of hemostasis. Some features, characteristic of patients from different clinical groups: dependence on the duration, the presence of concomitant somatic pathology, and the level of estrogen intenseness have been revealed in the study. With the rise in the bleeding duration the number of patients with hypercoagulation manifestations in the hemostatic system also increases. In adolescents with concomitant somatic pathology and hyperestrogenemia manifestations of an increased blood coagulation have been registered more often already at the first phase of the coagulation process.

Conclusion. Detection of disorders in the system of hemostasis will ensure in due time differentiated and efficient use of medications, designed to stop uterine bleeding, and will contribute to its faster stopping.

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Особенности системы гемостаза у больных с аномальными маточными кровотечениями пубертатного пери ода

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Резюме. Статья посвячена изучению системы гемостаза у больных с аномальными маточными кровотечениями пубертатного периода. Выявлены особенности состояния свертывающей системы крови у пациенток с АМК, не связанные с заболеваниями крови. Выяснено что только у незначительного количества больных на фоне АМК не регистрируется отклонений в системе гемостаза, у большинства отмечаются дефекты в свертывающей и противосвертывающей системах. Наибольшие изменения происходят во II и III фазе гемостаза. Выявлены особенности характерные для больных разных клинических групп, зависимость от длительности кровотечения, наличия сопутствующей соматической патологии, уровня эстрогенной насыщенности. При увеличении длительности кровотечения возрастает количество больных с проявлениями гиперкоагуляции в системе гемостаза. У подростков с

сопутствующей соматической патологией и гиперэстрогенией чаще отмечались проявления повышения свертываемости уже в первой фазе коагуляционного процесса.

Ключевые слова: аномальные маточные кровотечения, девочки-подростки, система гемостаза.

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Особливості системи гемостазу у хворих з аномальними матковими кровотечами пубертатного періоду

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Резюме. Стаття присвячена вивченню системи гемостазу у хворих з аномальними матковими кровотечами пубертатного періоду. Виявлено особливості стану системи згортання крові у пацієнток з АМК, які не пов'язані із захворюваннями крові. З'ясовано, що тільки у незначної кількості хворих на тлі АМК не реєструється відхилень у системі гемостазу, у більшості відзначаються дефекти в системі згортання та протизгортання крові. Найбільші зміни відбуваються у II і III фазі гемостазу. Виявлено особливості характерні для хворих різних клінічних груп, залежність від тривалості кровотечі, наявності супутньої соматичної патології, рівня естрогенної насиченості. При збільшенні тривалості кровотечі зростає кількість хворих з проявами гіперкоагуляції в системі гемостазу. У підлітків із супутньою соматичною патологією та гіперестрогенією частіше відзначалися прояви підвищення згортання вже в першій фазі коагуляционного процесу.

Ключові слова: аномальні маткові кровотечі, дівчатка-підлітки, система гемостазу.

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COMPREHENSIVE TREATMENT OF PATIENTS WITH GENERALIZED PERIODONTITIS ASSOCIATED WITH ORAL LICHEN PLANUS BY MONITORING LOCAL IMMUNITY INDICES

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***Abstract**. Efficiency of our method of treatment of patients with CGP associated with lichen acuminatus is proved through recovery of indices of local non-specific immunity of the oral cavity such as lysozyme and beta-lysins activity and concentration of C3 fragments of complement as well as normalization of sIgA level directly after the course is finished and in 3 months after treatment.*
Normalization of indices of local immunity of the oral cavity is accompanied by absence of symptoms of inflammation of parodontium tissue.
***Keywords:** chronicle generalized periodontitis, oral lichen planus, local immunity characteristics, lysozyme containing medicine.*

One of the most important causes, which determine the possibility of conjoint contraction of chronic generalized periodontitis (CGP) and lichen acuminatus and define their course, is the state of local mechanisms of defense of the oral cavity [1, 2, 3]. Therefore, estimation of immune competence of the oral cavity in patients with CGP and lichen acuminatus can be one of possible objective criteria of treatment quality [4, 5].

The goal of our research is assessment of sIgA in the oral fluid, C3 components of the complement, activity of lysozyme and beta-lysins in patients suffering from CGP and lichen acuminatus before and after treatment, as indices of positive influence of suggested complex therapy on the immunological course of CGP pathogenesis.

The object and methods of the research. 72 patients were examined and divided into 4 groups. The first group (20 people) comprised patients with CGP of initial and mild severity without lichen acuminatus. 32 patients with conjoint course of CGP

(initial and mild severity) associated with acuminatus (typical form) were divided into 2 groups (2 and 3). The second group (16 people) was represented by patients with CGP and lichen acuminatus without involvement of the oral mucosa; the third group (16 people) was represented by patients with involvement of the oral mucosa. The fourth observational group comprised patients with intact parodontium (20 people). On the basis of treatment methods groups 2 and 3 were divided into subgroups 2a, 2b, 3a 3b (8 patiens in each one).

Systemic treatment of lichen acuminatus (after specialized medical consultation) consisted in prescribing of Delagil, 1 pill twice a day, Xantinol nicotinate, 1 pill three times a day and vitamin E in capsules, 1 capsule once a day, to the patients of the second and third groups.

Immunology research of the oral fluid included study of lysozyme activity by means of nephelometric method and also assessment of sIgA, C3 components of complement and beta-lysins activity by enzyme linked immunoassay.

The results of the research and their consideration. Efficacy of treatment of the patients representing different groups was assessed through study of indices of local immunity of the oral cavity, of both non-specific (lysozyme, beta-lysins, C3 components of conplement) and specific (sIgA) types of immunity.

In patients of all groups with CGP of initial and mild severity in the setting of lichen acuminatus of typical form (the second and third groups) as well as without lichen acuminatus (the first group) sharp decrease of lysozyme activity in the oral fluid is marked. After conservative treatment firm increase of lysozyme activity in the oral fluid of the patients of all observational groups after two weeks of treatment and while control measurement of lysozyme intake in 3 months is noted. However, only in the patients, who were undergoing treatment according to elaborated scheme, indices of lysozyme activity achieved the level of control ones and corresponded to it during the whole period of observation (from 34.86% до 36.38%).

Dynamics of control of beta-lysins activity of bactericide factor, which is most active against anaerobic and sporogenous aerobic microorganisms, during the whole period of observation has shown that in all patients with CGP and CGP associated

with lichen acuminatus of typical form, firm decrease of activity of this bactericide factor of the saliva in comparison with control before treatment and normalization of beta-lysins activity after use of different treatment schemes is identified.

The most important component of complement system is C3 fragment, the breakdown of which into C3a and C3b is considered to be a midpoint of each several cascades of activation of complement system which end with formation of membranes of attack complex and lysis of pathogenic bacteria of the oral cavity. Consequently in all patients with CGP and CGP associated with lichen acuminatus the level of this fragment of complement is reduced in comparison with control by 1.5-2. When standard schemes of treatment of the patients with CGP (groups 1, 2a and 3a) are used, positive dynamics is also apparent. However firm normalization of concentration of C3 fragments in the oral fluid is not achieved.

In all patients with CGP associated with lichen acuminatus in the oral fluid, increase of concentration of sIgA by 2 (in comparison with the norm) has been detected. After performed treatment according to the elaborated scheme normalization of sIgA level in the oral fluid of the patient of groups 2b and 3b during the whole period of observation was accomplished.

Conclusions. With reference to the foregoing it is possible to draw a conclusion that CGP as well as conjoint course of CGP and lichen acuminatus are accompanied by significant changes of local immunity of the oral cavity which become apparent in the form of sharp decrease of lysozyme and beta-lysins activity, reduction of the amount of C3 components of complement and increase sIgA level in the oral fluid.

Efficiency of our method of treatment of patients with CGP associated with lichen acuminatus is proved through recovery of indices of local non-specific immunity of the oral cavity such as lysozyme and beta-lysins activity and concentration of C3 fragments of complement as well as normalization of sIgA level directly after the course is finished and in 3 months after treatment.

Normalization of indices of local immunity of the oral cavity is accompanied by absence of symptoms of inflammation of parodontium tissue.

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Елисеева О.В., Соколова И.И.

Комплексное лечение больных с генерализованным пародонтитом на фоне красного плоского лишая мониторированием показателей локального иммунитета

Харьковский национальный медицинский университет, Украина

Резюме. Было изучено состояния иммунитета полости рта у пациентов с ХГП на фоне КПЛ, как одного из возможных объективных критериев качества лечения. Успешное лечение больных, по разработанной нами схеме («Лизомукоид», «Лисобакт» лизоцимсодержащие пленки), сопровождается восстановлением показателей местного неспецифического иммунитета полости рта - активности лизоцима и бета-лизинов, концентрации С3 фрагмента комлемента, а также нормализацией уровня sIgA, как непосредственно после окончания курса, так через 3 месяца после завершения терапии.

Ключевые слова: хронический генерализованный пародонтит, красный плоский лишай, показатели местного иммунитета, лизоцимсодержащие средства.

Єлісєєва О.В., Соколова І.І.

Комплексное лікування хворих із генералізованим пародонтитом на тлі червоного плоского лишаю моніторуванням показників локального імунітету

Харківський національний медичний університет, Україна

Резюме. Було вивчено стан імунітету ротової порожнини у пацієнтів із хронічним генералізованим пародонтитом на тлі червоного плоского лишаю як одного із можливих об'єктивних критеріїв якості лікування. Успішне лікування хворих за розробленою нами схемою («Лізомукоїд», «Лісобакт», плівки що містять лізоцим) супроводжується відновленням показників місцевого неспецифічного імунітету ротової порожнини, таких як активність лізоциму та бета-лізинів, концентрація С3 фрагменту комплементу, а також нормалізація рівня sIgA, як безпосередньо після закінчення курсу, так і через 3 місяці після завершення терапії.

Ключові слова: хронічний генералізований пародонтит, червоний плоский лишай, показники місцевого імунітету, плівки що містять лізоцим.

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PERIODONTAL TISSUE CONDITION (PMA), ORAL HYGIENE (OHI-S) AND QUESTIONNAIRE SURVEY IN 9-11-YEAR OLD SCHOOLCHILDREN WITH DIFFERENT EDUCATION LOAD

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Abstract. *The study of education load impact, created by different education systems shows that the increase in intellectual activity volume has an influence on schoolchildren. The influence of increased load is often adverse. The aim of our research was to investigate oral hygiene state and periodontal tissue condition and questionnaire in schoolchildren 9-11 year old, who are enrolled in different education programs (children enrolled in general education program and schoolchildren enrolled in advanced study of foreign languages).*
Key words: *periodontal tissue, children, gingivitis, hygiene of oral cavity, indexes of hygiene of oral cavity, schoolchildren, education load.*

Introduction. Children's health condition is the condition of health of the nation. In view of the above the doctors have been working hard to determine the factors which have an adverse impact on children's health. It has been of particular importance to detect such factors which have an impact on schoolchildren [1, 2, 3, 4, 10].

Over the last years the number of specialized schools, lyceums, classes with enhanced studying of different subjects is evidently increasing in our country. An apparent dependence of the degree and character of impairment of schoolchildren's health and the amount and intensity of academic load has been revealed [1,2].

New programs are different from the typical ones by the increased intensity of education load and require from schoolchildren significant psychoemotional efforts. Great energy demands are related to the strain of functional systems, which in its turn can have an impact on somatic health of the child [3, 10].

Due to insufficient exploration degree of new methods of study and their impact on schoolchildren, it is necessary to investigate health condition of children in new learning environment. Comprehensive integrated study and hygienic reasoning

of new education systems are required to eliminate their negative impact on child's body [1, 3].

The study of education load impact, created by different education systems shows that the increase in intellectual activity volume has an influence on schoolchildren. The influence of increased load is often adverse [1, 2, 4].

However, according to the data, provided by the current literature, there is no evidence confirming the impact of different educational load on the oral health of schoolchildren [5, 6, 7, 8, 9].

The aim of our research was to investigate oral hygiene state and periodontal tissue condition in schoolchildren 9-11 year old, who are enrolled in different education programs (children enrolled in general education program and schoolchildren enrolled in advanced study of foreign languages).

Materials and methods: this research involved 75 children at the age of 9 – 11 years. This group included 45 schoolchildren who were enrolled in collegium program with enhanced study of foreign languages (first group, the main one) and 30 schoolchildren enrolled in traditional secondary education program (second group, the control one). The children were examined by standard procedure (WHO). The authors employed index assessment of periodontal tissue condition by PMA. Index assessment for oral hygiene determination was carried out by simplified oral hygiene index (OHI-S) J.C. Green, J.R. Vermillion.

The purpose of the survey children were given a questionnaire in which they had to answer at home with parents. The questions also concerned the oral hygiene daily brushing, the rigidity of the brush and the frequency shifts, the use of chewing gum and the multiplicity of visiting the dentist.

Results and their discussion. Index determination according to PMA shows that schoolchildren have different periodontal tissue condition. After staining the gums in the area of the teeth following results were obtained: not revealed the presence inflammation 69.5% children enrolled in board education program in 87.5% in the general education. At the same time, the inflammation of the gingiva mild

detected in 30.5% of the first group of child, and 12.5% to the second group of children.

Simplified oral hygiene index data (OHI S) J. C. Green, J. R. Vermillion (Oral Hygiene Indices Simplified) - the majority of children, 82,2% children of the first group and 91,5% children of the second group have low score, which confirmed good oral hygiene. Middle level, i.e., satisfactory oral hygiene, was observed in 11,8% board education program schoolchildren and 8,5% general education program schoolchildren. Unsatisfactory oral hygiene index was observed in 4,0% board education program schoolchildren. Extremely poor oral hygiene was found in 2,0% schoolchild of the same group. As for general education program schoolchildren, they did not show neither unsatisfactory nor poor oral hygiene.

In the questionnaire schoolchildren revealed that the majority of them brush their teeth twice a day, 50.0% schoolchildren enrolled in advanced study of foreign languages and 53.7% children enrolled in general education program. 44.6% of the children of the first group and 43.9% second - spend brushing their teeth in the morning, and 5.4% and 2.4%, respectively, perform this hygienic procedure only in the evening, i.e., once a day.

Most children in both groups use toothbrushes average rigidity of 60.8% of students in the main group and 61,0% of the comparison group. Soft brush prefer 35.1% and 34.1% of the children. On the "super-soft brush," replied 2.7% of students in collegiate programs and 4.9% - general. And only 1.4% of the surveyed children of the first group said that they do not know what is on the stiffness of the brushes used.

The main part of schoolchildren enrolled in advanced study of foreign languages (52,7%) and children enrolled in general education program (52,7%) produce change toothbrush every three months. Every 6 months change brush 25.7% of children of the first group and 29.3% of the second. Monthly change occurs in 18.9% of pupils main and 22.0% of the comparison group. Also found that 2.7% of pupils collegiate programs do not change toothbrushes in general. 41.9% of children of the first group and 39.0% - second, do not use chewing gum at all or can use them very rarely, and the rest of the children in both groups generally

prefer them to chew after eating (to 2.7% and 2.4%) or in the presence of unpleasant mouth odor (23.0% 26.8%), or independently of food intake (32.4 % and 31.7 %).

On the question about the frequency of their visits to the dentist, 43.2% of children of main and 36.6% of the comparison group, said that the visit of the doctor when something starts to bother. Preventive checkups to the dentist once in three months to go to 9.5% of students first and 14.6% of children in the second group. Every 6 months visit dentist 24.3% of schoolchildren enrolled in advanced study of foreign languages and 22.0% - children enrolled in general education program. And, just at 14.9% and 26.8%, respectively, arrange visits to the dentist once a year. Also, during the survey, we found that 6.8% of school children of the main group do not go for checkups and treatment to the dentist.

Conclusion: 1.A result the authors obtained data suggesting that the majority of schoolchildren, enrolled in board education program were found to have more signs of periodontal tissue inflammation in comparison to the children enrolled in general education program.

2. The obtained results give a possibility to draw a conclusion that board education program schoolchildren are prone to a higher risk of oral diseases development, first of all such as gingivitis and caries.

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Волченко Н.В., Соколова И.И., Назарян Р.С.

Состояние тканей пародонта (PMA), гигиены полости рта (OHI-S) и анкетирование 9-11-летних школьников, обучающихся по разным учебным программам

Харьковский национальный медицинский университет, Украина

Резюме. Изучение влияния различных учебных программ, доказывает, что повышение умственной нагрузки оказывает большое влияние на здоровье школьников. По данным многих авторов, влияние углубленных программ часто бывает неблагоприятным для здоровья детей. Целью нашего исследования было изучение состояния гигиены полости рта и тканей пародонта и анкетирование школьников 9-11 лет, обучающихся по разным учебным программам (общеобразовательные программы и с углубленным изучением иностранных языков).

Ключевые слова: ткани пародонта, дети, гингивит, гигиена полости рта, индексы гигиены, школьники, программы обучения.

Волченко Н.В., Соколова І.І., Назарян Р.С.

Стан тканин пародонта (PMA), гігієни порожнини рота (OHI-S) та анкетування 9-11-літніх школярів, які навчаються за різними учбовими програмами

Харківський національний медичний університет, Україна

Резюме. Вивчення впливу різних учбових програм підтверджує, що підвищення розумової напруги призводить до суттєвих змін в здоров'ї школярів. За даними деяких авторів, вплив поглиблених програм досить часто є несприятливим для стану здоров'я дітей. Метою нашого дослідження стало вивчення гігієни порожнини рота і тканин пародонта та анкетування школярів 9-11 років, що займаються по різним навчальним програмам (діти, які навчаються за загальноосвітньою програмою і школярі з поглибленим вивченням іноземних мов).

Ключові слова: тканини пародонта, діти, гінгівіт, гігієна порожнини рота, індекси гігієни, школярі, різні програми навчання.

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PRINCIPLES OF MEDICINE OF BORDERLINE CONDITIONS IN SOLUTION OF PROBLEM OF YOUTH SOCIAL DISADAPTATION

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Abstract. *In connection with the problem of medicine of borderline conditions there were conducted comparative hygienic, physiological, psychological researches of the effect of vocational training on the functional status and health of students with different levels of social adaptation in Kharkov lyceum of building and social rehabilitation. There were three groups under study: lyceum students with disabilities, lyceum students - orphans, healthy lyceum students from wealthy families.*

The general regularities and fundamental differences of life activity in different groups of lyceum students were ascertained. The differences in the success of cognitive activity and psycho-emotional state associated with the level of social adaptation were found. A low level of mental capacity resistance and memory volume, low behavioral activity and different directions of personality traits are typical for lyceum students with disabilities, and lyceum students - orphans are behind their age-mates in short-term memory. This can be regarded as a sign of their social disadaptation.

Keywords: *psychohygiene, medicine of borderline conditions, lyceum students - adolescents, persons with disabilities, orphans, functional state, social adaptation*

A significant increase of amounts of marginalized persons in the population of Ukraine is one of the negative consequences of social and economic disorders of the last time [1, 2, 3]. As shown by studies in recent years, this problem becomes especially topical when children fall into this group separated from traditional society. In this case, not only socially aggressive environment distorts the personality, but also an individual with certain negative psychological type is looking for yourself adequate environment [4, 5, 6]. According to many researches, it is known that an orphanhood [7, 8, 9] and disability [10, 11, 12] are the most common causes of social deadaptation of young people. Just these numerous social groups in relation to their

traditional vulnerability, most suffer in modern society. Conversely, the creation of the necessary social and health conditions of education for the growing generation, and strengthening the general and mental health is a prerequisite of a perspective development of Ukrainian society [13]. One of the priorities of further development of the health care system is a creation of a set of hygienic measures for the medical and social rehabilitation of disabled children and orphans belonging to the risk group. Medicine of borderline conditions is modern direction of medicine that studies general patterns of prenosological state formations and transitional processes of their transformations [14]. Principles of Medicine of borderline conditions are realized in hygiene practices for timely identification of unhealthy prenosological conditions, detection and elimination of risk factors with subsequent medical correction directed at health maintaining and strengthening for different population groups.

The aim of the study was a creation and implementation of measures of medicine of borderline conditions for prenozological diagnostics and psychohygienic optimization of mental health for vocational school students with lower level of social adaptation.

Materials and methods

The object of observation in natural hygienic experiment were 1029 adolescents of both sexes aged 12-17 years, mastering the building trades in Kharkov lyceum of building and social rehabilitation (KhLBSR). Groups of comparison consisted of: disabled lyceum students (first experimental group, 224 persons), lyceum students - orphans (second experimental group, 253 persons), healthy lyceum students from wealthy families (control group, 552 persons). The program of experiment included the analysis of the life activity trends, indicators of the functional state of the central nervous system, emotional state and personality traits of school students [15].

Results of researches

In the first stage, it was carried out a comparative study of the features of lyceum students' life. In the study of the features of experimental groups living conditions it was found that 47 % of the surveyed lyceum students with disabilities

and 100 % of lyceum students orphans live in a hostel. In contrast, 98 % of the lyceum students from the control group were permanently resident within their own families. Conditions of teens stay at the Lyceum satisfy hygienic requirements, but a certain complex of interrelated factors acts on lyceum students. There are factors of socio-psychological and regime-organizational type and they have an effect on life activity of teenagers.

Psychological microclimate in the lyceum students as a whole meets the psychological needs of the majority of students in the control group (90,32 ± 2,79) %), students with disabilities (86,67 ± 9,42) %) and students-orphans (69,23 ± 10,88) %). Low physical activity is typical for all comparison groups. It determines the need to introduce additional measures for their physical education. Relatively high self-esteem physical activity of lyceum students with disabilities is a consequence of their subjective perception.

Most lyceum students in the control group observed the rational day regimen (62,90 ± 5,47) %, $p < 0.01$). There were no significant differences in this indicator in groups of disabled students and students - orphans ($p > 0.05$). The ratio of lyceum students who rated their nutrition as satisfactory, with those who rated it as poor, was 50: 50 %. Significant differences in character of nutrition are absent in comparison groups ($p > 0.05$).

Significant differences are observed in indexes of the abidance by the rules of personal hygiene and a healthy lifestyle in the comparison groups. It was found that 100.0% lyceum students with disabilities and (30,77 ± 16,31) % lyceum students - orphans do not comply to these rules. Thus, the physical health of lyceum students is a determining factor in meeting the requirements of personal hygiene. Orphanhood is a factor associated with the spread of harmful habits, primarily smoking.

A comparative study of lyceum students cognitive activity was carried out at the second stage of the research.

Parameters of accuracy (K) and the stability of attention (S) did not change significantly during the study period ($p > 0.05$), it reflects the general laws of the adaptation process. However, significant changes were observed in index of mental

capacity (I): it reduces to the second year from (159,20 ± 7,69) s.u. up to (99,75 ± 4,02) s.u. , and then increased in the third year to (113,99 ± 3,23) s.u. and decreased again in the fourth year to (99,50 ± 14,52) s.u. ($p < 0.01$).

This phenomenon allows to characterize the index of mental capacity as the most sensitive psychophysiological indicator of the functional state of lyceum students in KhLBSR. At the same time, the coefficient of accuracy and stability of attention reflect resistance of the body functioning in a receiving of vocational training, regardless of the degree of social adaptation.

The kind of the mastering profession, and also age of lyceum students and the period of their study, affect their mental capacity in a certain way. More stable functional state observed in adolescents who master the profession "barber", "carpenter", "painter", "plasterer". Less stable - in lyceum students who master the profession "plasterer, cladder-tiler, painter".

Among of them it's observed multidirectional functional shifts, which manifests itself in decrease of the coefficient of accuracy (K) ($p < 0.05$) and increase of the index of mental capacity ($p < 0.01$) due to relatively high absolute values of these parameters (0,79 ± 0,02) s.u. and (105,85 ± 3,57) s.u., respectively). Comparative analysis of mental capacity showed that the mental capacity of disabled students has been significantly lower than in groups of lyceum students-orphans and lyceum students in the control group (K: (0,65 ± 0,05) s.u., I: (85,91 ± 9,66) s.u., and S: (6,74 ± 1,49) s.u., p from <0.05 to <0.01), whereas the indicators of mental capacity in groups of lyceum students – orphans and lyceum students of the control group had high and close to its magnitude values ($p > 0.05$) (the coefficients K, I and S were respectively: (0,80 ± 0,02) s.u., (118,86 ± 4,99) s.u. and (8,71 ± 1,37) s.u. and (0,85 ± 0,05) s.u., (113,00 ± 2,59) s.u., (10,95 ± 1,05) s.u.) (Fig. 1).

Comparative analysis of the volume of short-term memory in three comparison groups shows that representatives of the control group had significantly more volume of short-term memory, which is (72,23 ± 1,00) s.u. This is significantly greater than that in groups of students with disabilities and students - orphans (respectively (61,66 ± 3,06) s.u. and (65,96 ± 2,51) s.u.) ($p < 0, 05$-$0,01$).

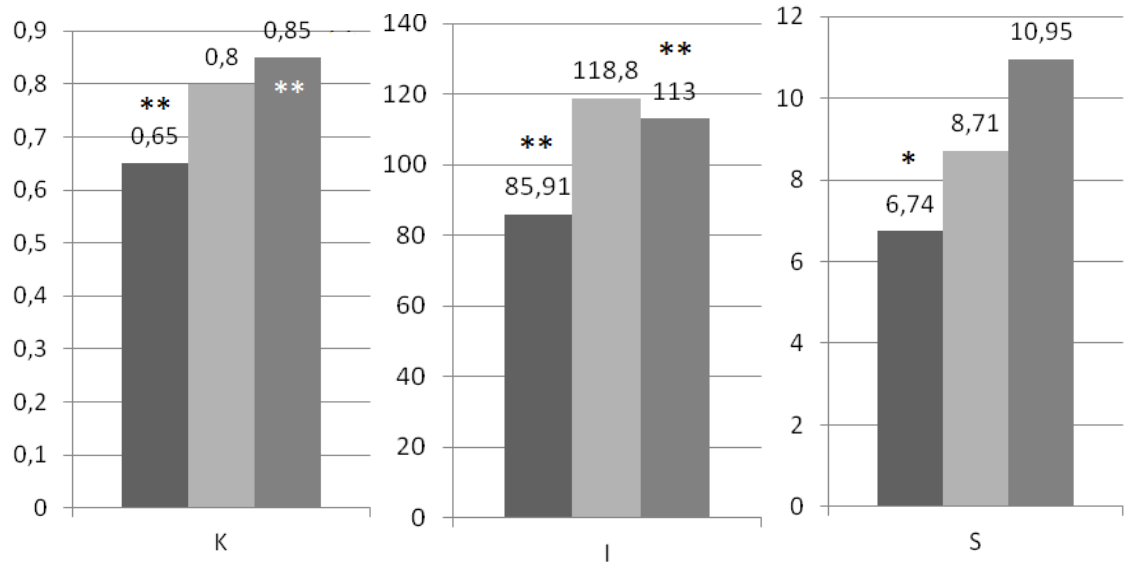

Fig. 1 Comparative characteristics of mental capacity of students with different levels of social adaptation in the Lyceum of building and social rehabilitation (n=318)

Note: K – accuracy, I – mental capacity, S - stability of attention;

1st experimental group, 2nd experimental group, comparison group;

* - P<0,05, ** - P<0,01

Statistically significant differences between the two experimental groups were not observed (p> 0.05). Noticeable difference in the dynamics of the short-term memory formation between lyceum students with disabilities, on the one hand, and students - orphans and students of the control group, on the other hand, was observed in all three years (p <0.01). This may be due to the similarity of the short-term memory formation in physically healthy persons, as opposed to those with physical defects.

The third stage of the research was aimed at establishing the role of the psychological component in training activities for students with different levels of social adaptation.

Most of the surveyed lyceum students (from (60,4 ± 3,44) % to (77,23 ± 2,95) % (p <0.05-0.01) correspond to a generalized psychological portrait. It describes sensible realistic friendly person with a good internal self-control and adequate self-esteem, with a satisfactory dynamism and communicability. However, such accentuation of personality as emotional rigidity, susceptibility to complications and

self-confidence are typical for a certain number of lyceum students (from (23,76 ± 2,99) % to (34,65 ± 3,35) %) .

Typical psychological profile of lyceum students with disabilities included such traits as a taciturnity and a tendency to complications, callousness in relation to others, coolness, high group dependence, low motivation, sluggishness, with emotional rigidity and insensitivity, which are combined with impulsivity and lightheadedness, proneness to conflict and impetuosity.

Such differently directed widespread accentuations of personality reflect the psychological complexity of adaptation of people with disabilities to the conditions of vocational training that they try to compensate by strictly sticking to the norms of behavior. This is evidenced by a significant number of lyceum students with normative values regarding the factors A, G («the tendency to feel - high normative behavior») (95,24 ± 4,65) %) and Q3 («low self-control - high self-control") (85.71 ± 7,64) %) ($p < 0.01$). This can be viewed as the prevalence of such positive character traits like sociability, strict adherence of norms and rules of behavior with high self-control among lyceum students with disabilities. Simplicity of psychological portrait is typical for lyceum students - orphans in contrast to the lyceum students with disabilities. Significant differences on individual factors by questionnaire of R. Cattell are virtually absent ($p > 0.05$). However, the prevalence of a certain set of accentuations gives reason to include a significant number of observable persons (to (50,00 ± 14,43) %) to unfriendly, unsure of their abilities, anxious, vulnerable, with a high perception of threat. The number of students with standard indices varied in the control group from (58,58 ± 3,79) % to (76,33 ± 3,27) % on certain scales of the questionnaire. Set of accentuations included excessive seriousness, a taciturnity, self-centeredness and a high level of group dependence.

The role of social adaptation in forming of adolescent psycho-emotional state was examined in the next stage of research. As a result of the study, it was found that the group of lyceum students had no significant differences in indices of cenesthesia, activity and mood ($p > 0.05$). This can be interpreted as a positive phenomenon

associated with adequate conditions of life for lyceum students. We also can not rule out that the lyceum students with disabilities evaluated their activity illusory.

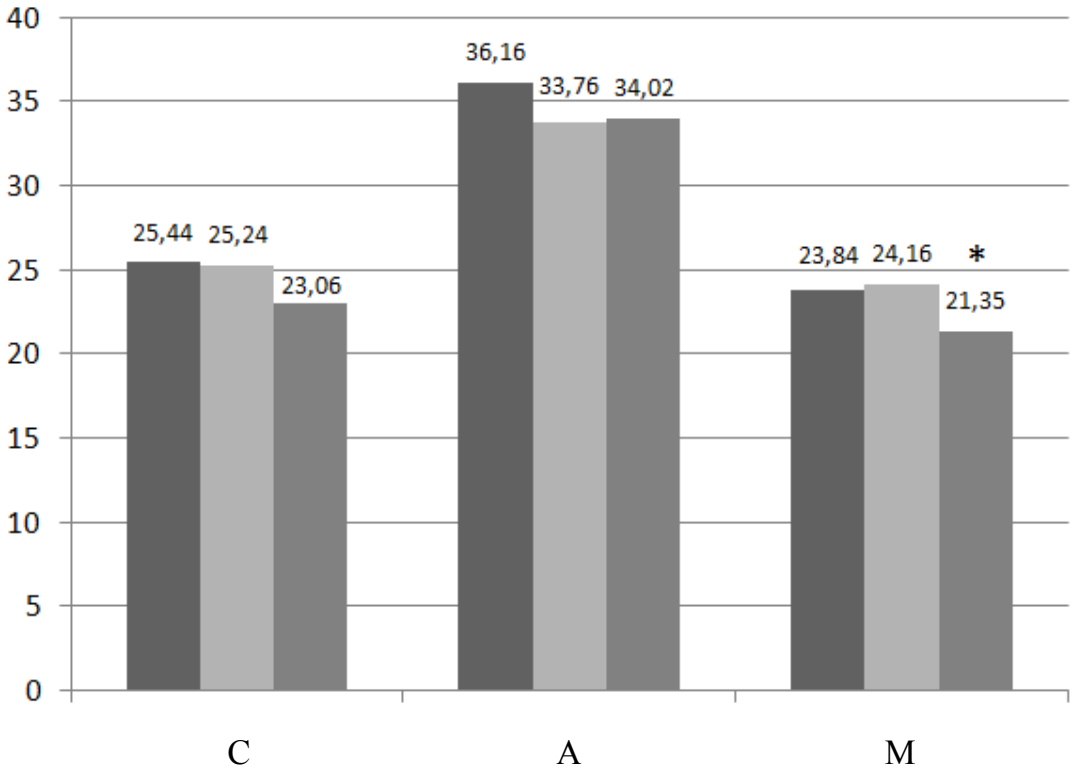

Fig. 2 Comparative characteristics of psycho-emotional state of lyceum students with different social status (n=318)
Note: C – cenesthesia, A – activity, M – mood;
1st experimental group, 2nd experimental group, comparison group;
* - P<0,05, ** - P<0,01

However, according to index "mood", lyceum students – orphans took the lead over their age-mates (24,16 ± 1,05) s.u., p <0.05). That can be interpreted as their excessive self-esteem on this indicator. But the absence of significant changes in these indicators over the study (p> 0.05) reflects the persistent emotional state and the adequacy of training loads in this comparison group. Low self-esteem in control group by the category "mood" can mean a certain mood disorder that requires the use of measures to correct psycho-emotional state of adolescents. Significantly lower behavioral activity observed in group of lyceum students with disabilities (p <0.01), at the same time indices of cenesthesia and mood were similar (p> 0.05). The value of index of activity for this group was (34,86 ± 2,08) s.u., in contrast to the healthy

lyceum students (42,90 ± 4,50) s.u.). Such differences can be regarded as a consequence of the direct impact of the somatic state on the psycho-emotional state, as long as the physical activity determines the psychological activity, and they determine behavioral activity in the aggregate.

The dominant index "mood" in the behavior of lyceum students – orphans defines characterological traits as positive characteristics of the general emotional background, the state of ardour and gladness.

"Activity" predominates in behavioral responses of persons in the control group. It defines the dynamic precondition of activity implementation. Lyceum students with disabilities have no expressed dominants in psycho-emotional state. However, low figures for the category of "activity" are defined difficulties experienced by the individual in the formation of a model of his activities and its implementation.

It was also found that the psycho-emotional state of lyceum students had positive dynamics. It was characterized by a certain stability of indices "cenesthesia" and "activity" ($p > 0.05$), a significant improvement of mood ($p < 0.01$) during the all period of study. However, the worsening in the psycho-emotional state of lyceum students in their third year of study can be attributed to the time period of psychological risk. This period requires the introduction of measures for psyhohygienic correction of the adaptation process. The main objective of these measures – prevention of specific prenosological state – overfatigue.

Conclusion

It was found that the lyceum students are in typical common and favorable conditions of training and production environment, regardless of their social status. Account the specific needs of people with disabilities identifies the leading role of the level of social adaptation in the formation of lyceum students' life activity.

The general laws of this process include: high score of psychological microclimate in the group (90,32 ± 2,79) % of the respondents, $p < 0.01$), low physical activity (83,87 ± 3,61) % of the respondents, p <0, 01), a critical attitude to their nutrition (50: 50 % of respondents), inappropriate teaching load (100 %). The

fundamental differences include: failure to comply with the rules of rational day regimen (53,61 ± 2,76) %, p <0.01), neglect of the rules of personal hygiene (100 %, p <0.01), the spread of harmful habits among a significant number of lyceum students-orphans (30,77 ± 16,31) %, p <0.05). It is proved that the level of social adaptation is directly reflected in the success of cognitive activity of lyceum students. The following physiological parameters do not depend on the level of social adaptation: the constancy of the memory function (p> 0.05), the instability of attention (p <0.05), the inability to quickly be included in educational activities, psychological complexity.

Lyceum students with disabilities are inferior to their physically healthy age-mates in level of implementation and resistance of mental capacity indicators (accuracy: (0,65 ± 0,05) s.u., mental capacity: (85,91 ± 9,66) s.u.), attention (6,74 ± 1,49) s.u.) and memory volume (61,66 ± 3,06) s.u.) (P <0.05-0.01). Lyceum students - orphans are behind their socially adapted age-mates in indices of the short-term memory volume (65,96 ± 2,51) s.u.) (P <0.05-0.01), although they have similar dynamics of its formation.

Features a psychological portrait of lyceum students contribute to their social adaptation. Degree of social disadaptation of lyceum students with disabilities is reflected in the different directions of their personal characteristics. This is offset by a strict adherence with norms and code of behavior. The low level of social adaptation of students - orphans has manifested in the simplicity of their psychological portrait by a specific vulnerability, uncertainty in their abilities with high perception of threat.

General regularity of mental and emotional state formation in groups of lyceum students is its positive dynamics in period of study, namely a certain stability in indicators of cenesthesia and activity (p> 0.05), and a significant improvement in mood (p <0.01). The degree of social adaptation does not affect the psycho-emotional state of students - orphans (p> 0.05), but it is determining factor for lyceum students with disabilities. Significantly lower behavioral activity caused by the direct influence of the physical state is observed in this group (p <0.01).

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Принципы медицины пограничных состояний в решении проблемы социальной дизадаптации молодежи

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Резюме. В связи с проблемой медицины пограничных состояний проведены сравнительные гигиенические, психофизиологические, психологические исследования влияния условий и характера профессионально-технического обучения на функциональное состояние и здоровье лицеистов Харьковского профессионального лицея строительства и социальной реабилитации с разным уровнем социальной адаптации (лицеисты-инвалиды, лицеисты-сироты, здоровые лицеисты из благополучных семей).

Установлены общие закономерности и принципиальные различия жизнедеятельности лицеистов. Обнаружены различия в успешности когнитивной деятельности лицеистов и их психоэмоциональном состоянии, связанные с уровнем из социальной адаптации. Для лицеистов-инвалидов характерен более низкий уровень устойчивости умственной работоспособности и объема памяти, низкая поведенческая активность и разнонаправленность личностных черт, а лицеисты-сироты отстают от своих сверстников по объему кратковременной памяти, что может быть показателем их социальной дезадаптации.

Ключевые слова: медицина пограничных состояний, психогигиена, подростки-лицеисты, инвалиды, сироты, функциональное состояние, социальная адаптация.

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Принципи медицини граничних станів в рішенні проблеми соціальної дизадаптації молоді

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Резюме. У зв'язку з проблемою медицини пограничних станів проведено порівняльні гігієнічні, психофізіологічні, психологічні дослідження впливу умов і характеру професійно-технічного навчання на функціональний стан і

здоров'я ліцеїстів Харківського професійного ліцею будівництва та соціальної реабілітації з різним рівнем соціальної адаптації (ліцеїсти-інваліди, ліцеїсти-сироти, здорові ліцеїсти з благополучних сімей).
Встановлено загальні закономірності і принципові відмінності життєдіяльності ліцеїстів. Виявлені відмінності в успішності когнітивної діяльності ліцеїстів та їх психоемоційному стані, пов'язані з рівнем з соціальної адаптації. Для ліцеїстів-інвалідів характерний більш низький рівень стійкості розумової працездатності та обсягу пам'яті, низька поведінкова активність і різноспрямованість особистісних рис, а ліцеїсти-сироти відстають від своїх однолітків за обсягом короткочасної пам'яті, що може бути показником їх соціальної дизадаптації.
Ключові слова: медицина пограничних станів, психогігієна, підлітки-ліцеїсти, інваліди, сироти, функціональний стан, соціальна адаптація.

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PREVALENCE OF OBESITY AND OVERWEIGHT AND USING THE MEDICAL DOCUMENTS TO IDENTIFY THE TRUE PREVALENCE OF OBESITY AND OVERWEIGHT IN SCHOOLCHILDREN 6-17 YEARS

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Abstract. *Conducted an analytical review of the literature on the problem of childhood obesity has shown that the prevalence of childhood obesity worldwide has reached catastrophic proportions, and even the world, regardless of gender, race and social class continues to grow rapidly. The article presents the results of the monitoring of weight and height of schoolchildren 6-17 years living in the October district of Kharkov. In accordance with accepted standards of body mass index, from 3227 students whose data have been processed, overweight and obesity was found in 512 children (15.8%), including obesity were 200 children (6%); overweight - 312 (9.6%). In comparing our results and medical records data on the number of persons to be held at the dispensary for obesity in the current year, it was found that the rate of complete coverage of medical observation of children with obesity is only 7%.*
Keywords: *schoolchildren, obesity, overweight, monitoring.*

Introduction. One of the most serious problems facing public health in the XXI century is obesity among children. Increase in the prevalence of overweight in children population in many countries can be attributed to non-infectious disease epidemic. Excess weight is recognized as one of the major risk factors for many diseases such as diabetes, hypertension, coronary heart disease, liver disease and gall bladder, and many others. In addition, foreign researchers have noted that obesity in childhood causes a number of psychological and social problems, which primarily include the formation of psychological stress, low self-esteem, dissatisfaction with their body, depression, the emergence of suicidal thoughts, loss of control over food, unhealthy and extreme weight control behavior, violation of social ties, the stigma of obesity and reduced quality of life related to health.

Aim. To analyze the literature data on the prevalence of the problem of overweight and obesity in child populations around the world and providing monitoring of weight and growth of school pupils.

Materials and methods. Bibliographic method analyzes literary sources on the problem of the prevalence of overweight and obesity in children. In order to identify the true prevalence of overweight and obesity in children in Kharkov population we carried out a copy of examinations data of 8 schools in October district, in Kharkov. No generally accepted criteria of verification of obesity in childhood and adolescence currently. In most epidemiological studies measure of obesity is a BMI greater than 95th percentile. So, to solve this purpose, we performed a copy of examinations data of 8 schools in October district, in Kharkov. Overweight and obesity were verified using international criteria of BMI adjusted for age and sex of the child [6], which correspond to the ratio of BMI percentile tables for age (overweight> 85, obesity> 95 percent).

Results and discussion. According to the WHO, a total increase in obesity in children and adults over the past decade was 75%. A world leader in the fastest growth rates and the high prevalence of obesity in both adults and children is the United States. Currently, the country's highest documented incidence of obesity in children in the world: 1 in 6 children are obese, 1 out of 3 kids is overweight [11]. 5% of US children aged 2 to 19 years were obese (according to the definition of the US Centers for Disease Control and Prevention) in the 1970s only. By 2008, this had risen to 17%. Obesity is most commonly diagnosed in boys than in girls (19% vs. 5%). About 10% of infants in the United States have increased rates of body weight in relation to body length. In assessing the prevalence of overweight and obesity in children in other countries of North America - Canada - revealed similar patterns. Also notes an increase in the number of obese children in 2 times, and in some age groups - 3 times, starting from the second half of the 70s. the last century. Despite the fact that approximately 9% in children 6-17 years to 2007-2008 are obese, these figures are lower than in the US. The problem of overweight and obesity is becoming more pronounced in Latin America and Kari bang. Despite the fact that the number

of malnourished children in this area is still large enough, a distinct trend in the observed reduction in the number of children who are underweight past two decades - from 7% in 1990 to 3% in 2010 - and the gradual predominance of children with overweight and obesity [8]. It is estimated among preschool children in 2010 about 7% are overweight and obese. In Europe, there are more than 80 million. Children and adolescents who are overweight or obese [7], with the excess weight is observed in 10-30% of children aged 7-11 years and 8-25% of adolescents 14-17 years. In Europe, the "leadership" of the US obesity challenge dozens of countries. The first in the list are the United Kingdom, Spain, Hungary, Romania, Greece and Albania. In the United Kingdom from 1995 to 2002, the number of children with overweight and obesity has increased from 18 to 23% [5]. An increasing number of children with obesity and excess weight resides in southern Europe (Spain, Italy, Greece, Crete), while the lowest rates of obesity observed in children in the Nordic countries, although the negative trends have been identified in this region. The prevalence of children of early school age is overweight and obesity varies from country to country (according to the review of 27 countries of the European Union): from 32% in Spain to 12% in Romania. According to the results of monitoring of obesity in young children in 13 European countries (Belgium, Bulgaria, Cyprus, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Norway, Portugal, Slovenia and Sweden) on the initiative and with the use of WHO standards, overweight with 24% of children aged 6-9 years. The highest rate of obesity among adolescents (10-18 years) on the basis of data provided by 30 countries (27 countries outside the EU, and in addition to Iceland, Norway and Switzerland), found in Greece, Spain, Cyprus and the UK [9]. The main problems of the African continent are still hunger, malnutrition, underweight and stunting among children. At the moment 20-25% of preschool children in the region are scarce African Subsahary weight. Nevertheless, even in these regions, the number of obese children has doubled in the past two decades: from 4% in 1990 to 8.5% in 2010. The greater numbers of obese children live in more affluent countries of North Africa (Algeria, Egypt, Libya, Morocco, South Sudan, Sudan, Tunisia, Western Sahara). A significant increase in children with overweight and obesity (3 times),

there has been since 1990y. With coverage ranging from country to country: 20% of children with overweight and obesity in Egypt to 5% - in Sudan. In the region of the African Subsahary number of children with obesity and overweight among preschool children slightly - about 9% in the middle of Africa, 6% - in West Africa, 7% - in East Africa and 8% - in South Africa. But even in most of these regions, the number of overweight children and obesity has doubled or even tripled compared with the figures that were two decades ago. The situation of obese children in Asia resembles the state of affairs in Africa. Despite the ongoing fight against hunger, especially in South Asia, where one of the three children of early school age is underweight in the region there is a significant increase in children with excess weight. Everywhere in Asia (excluding Japan), according to the 2010, about 5% of children are overweight, which is 53% more compared to 1990 in terms of absolute figures of 17.7 million pre-school children . It is characteristic that in South Asia (Bangladesh, India, Pakistan), the level of obesity in children is quite low, but there was a significant increase in the number of children with excess body weight. The situation is aggravated by the fact that in adult patients, the complications associated with obesity, revealed at a lower body mass index (BMI) than those living in the United States and Europe. In 2010, depending on the region the prevalence of obesity in preschool children was higher than the countries of Western Asia than East, Southeast and South Central Asia (15, 5, 5, and 4%, respectively). At the same time in South Central Asia has the world's largest number of pre-school children with excess weight - 6.6 million. The data relating to the prevalence of overweight and obesity in schoolchildren and adolescents, few in number, but in summary form they give a fairly depressing picture. In China, over the past 20 years, according to a national study, there has been substantial growth in children and adolescents with obesity at the age of 8-18 years. In 1985, only 2% of boys and 1% of girls was revealed excess weight or obesity, taking into account the specificities of national standard indicators (BMI over 24 - excess body weight, more than 28 - obese). By 2005, this figure rose to 14% of boys and 9% of girls, which are 21 million children. In India, according to one of the largest epidemiological studies, including about 40 thousand. Overweight

or obesity was found in 14% of the child population 8-18 years old, accounting for 15 million children. In West Asia, the highest rates of obesity observed in the Arab countries. Data presented Kuwait show that 44% of males and 46% of girls are overweight or obese. In the developed countries of Oceania such as Australia and New Zealand, the rate of obesity in children has increased an average of 2 times with some slowdown in growth over the past decade the number of children with overweight and obesity in developing countries, despite the ongoing fight against hunger in some regions (Southeast Asia, some countries in Africa), a number of researchers (Popkin BM, Adair LS, 2012) associated with the changing nature of power from the traditional to the "western model". As a result of this "food intervention" Developing countries face a double problem: infectious diseases as a result of malnutrition, and a sharp increase in the number of chronic diseases associated with obesity and Western-style life. According to the literature, the prevalence of obesity among children in Russia ranges from 3-5 to 20% [4]. In Russia obesity have 5.5% of children living in rural areas, and 8.5% of children - in the city [2, 3]. In Ukraine obesity reported in 105 thousand. Children under 18 years are identified annually from 20 to 24 thousand children. Obesity in childhood in Ukraine ranked the 2-nd in the structure of children's endocrine pathology after diffuse goiter. In Kharkov, overweight was found in 8.2% of the students, and obesity - at 4.7%. So, the prevalence of childhood obesity worldwide has reached catastrophic proportions, and even the world, regardless of gender, race, and social class continues to grow rapidly [7]. The implications of this phenomenon for health are difficult to predict. Huge medical and social significance of obesity and diseases associated with obesity, manifests in childhood determines the relevance of research in this direction. At the same time, we have found that the official documentation of children's polyclinics and endocrinology clinic of Kharkov does not reflect the true level of prevalence of obesity in children and the aim of our study was the monitoring of weight and height in order to identify obesity and overweight among schoolchildren 6-17 year old.

We have processed the data in 3227 children aged 6 to 17 years. Overweight and obesity was found in 512 children (15.8%), including obesity were 200 children (6%); overweight - 312 (9.6%), morbid obesity (BMI> 35) was found in 3 children (0.09%). It was found that out of 200 obese children; only 14 are composed at a dispensary observation. Thus, the rate of complete coverage of medical observation was 7%. In the study of age-sex structure of the following results: in the age group of 6 to 9 years, obesity was observed in 83 children (2.5%); excess weight in 114 children (3.4%). In the age group between 10 and 13 years, respectively, in 86 children (2.6%) and 111 children (3.4%). Obesity among school children from 14 to 17 years was observed in 31children (0.9%); excess weight in 87 children (2.7%). (Fig.1). The obtained data show that the incidence of obesity and excess weight is much higher in the age groups of 6 to 9 and from 10 years to 13 years than in the age group from 14 to 17 years.

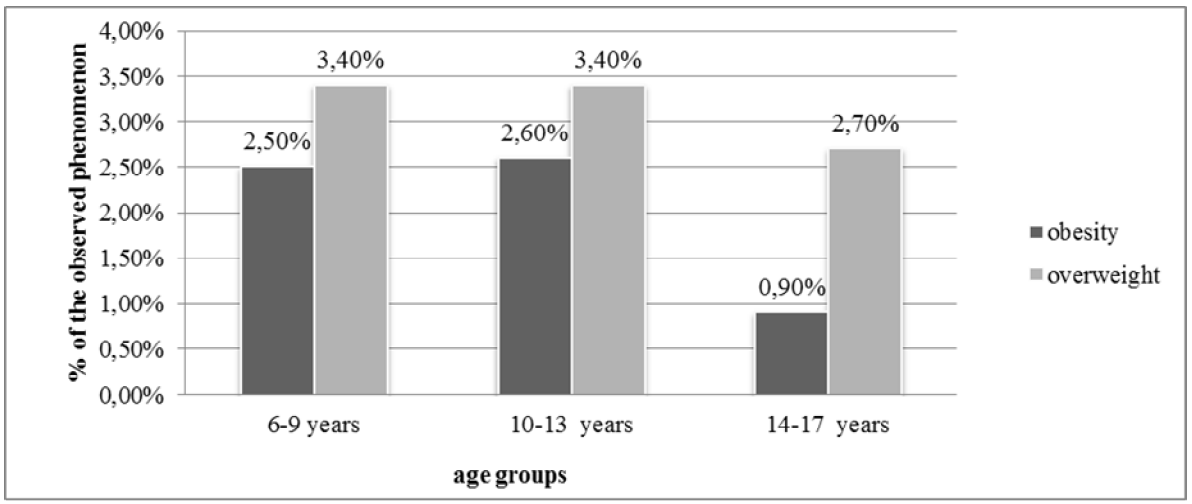

Figure 1.The Prevalence of overweight and obesity by age groups of adolescents.

Accordingly, the proportion of children with obesity and overweight in the first two groups of the same age, at 38%, while in the latter group were significantly lower at 23%. According to our data in almost all age groups in boys obesity and excess weight met statistically more likely than girls. In the whole group of girls obesity and overweight at the age of 6-17 years occurs - in 7.3% of cases. Among boys, obesity and overweight have - 8.4%; respectively 46.5 and 53.5%.

The results of our study led to the **following conclusions:**

1. The prevalence of childhood obesity worldwide has reached catastrophic proportions, and even the world, regardless of gender, race, and social class continues to grow rapidly, which is a medical and social problem of pediatrics at the moment and will lead to an increase in the incidence rates of the most important non-epidemic diseases in adults in the future.

2. The incidence of obesity among our study population of children and adolescents aged 6-17 years of age is - 6% overweight - 9.6%

3. The prevalence of obesity and excess weight in adolescent boys is statistically higher than in girls and is respectively 8.4%; and 7.3%.

4. The trend is the prevalence of obesity and overweight in the age groups from 6 to 9 years (5.9%) and from 10 to 13 years (6%), compared to the age group of 14 to 17 years (3.6%).

5. Indicator completeness dispensary coverage of obese children in our studied group of pupils is 7%. Thus, the value of this index, in turn, gives grounds to assume that the medical and social problem of obesity and overweight, which today is facing a health care system, is not reflected in full. Thus, taking into account the importance of this problem, it is planned to continue the study of obesity and overweight among children and adolescents for more detailed study of the features of the disease.

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Помогайбо Е.Г., Чумак Л.И.

Распространенность ожирения и лишнего веса и использование медицинской документации для выявления истинной распространенности ожирения и лишнего веса у школьников 6-17 лет.

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Резюме. Проведенный аналитический обзор литературы по проблеме детского ожирения показал, что распространенность детского ожирения по всему миру достигла катастрофических масштабов и продолжает расти стремительными темпами вне зависимости от пола, расы и социальной принадлежности. Приведены результаты мониторинга веса и роста школьников 6-17 лет, проживающих в Октябрьском районе г. Харькова. В соответствии с принятыми

стандартами индекса массы тела, из 3227 учащихся, данные которых были обработаны, избыточную массу тела и ожирение было выявлено у 512 детей (15,8%), в том числе ожирение имели 200 детей (6%); избыточную массу тела-312 (9,6%). При сопоставлении полученных нами результатов и данных медицинской документации о количестве лиц, которые состоят на диспансерном учете по поводу ожирения в текущем году, было установлено, что показатель полноты охвата диспансерным наблюдением детей с ожирением составляет всего лишь 7%.

Ключевые слова: школьники, ожирение, избыточная масса тела, мониторинг.

Помогайбо К.Г., Чумак Л.І.

Поширеність ожиріння та зайвої ваги і використання медичної документації для виявлення дійсної поширеності ожиріння та зайвої ваги у школярів 6-17 років.

Харківський національний медичний університет, Україна

Резюме. Проведений аналітичний огляд літератури щодо проблеми дитячого ожиріння показав, що поширеність дитячого ожиріння по всьому світу досягла катастрофічних масштабів та продовжує зростати стрімкими темпами незалежно від статі, раси та соціальної приналежності. Наведено результати моніторингу ваги і зросту школярів 6-17 років, що проживають в Жовтневому районі м.Харкова. Відповідно до прийнятих стандартів індексу маси тіла, з 3227 учнів, дані яких були оброблені, надлишкову масу тіла і ожиріння було виявлено у 512 дітей (15,8%), у тому числі ожиріння мали 200 дітей (6%); надлишкову масу тіла-312 (9,6%). При зіставленні отриманих нами результатів і даних медичної документації про кількість осіб, які перебувають на диспансерному обліку з приводу ожиріння в поточному році, було встановлено, що показник повноти охоплення диспансерним наглядом дітей з ожирінням становить всього лише 7%.

Ключові слова: школярі, ожиріння, надлишкова маса тіла, моніторинг.

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MODERN PERTUSSIS EPIDEMIC PROCESS IN UKRAINE AND SURVEILLANCE FOR PERTUSSIS

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***Abstract**. The article is devoted to the investigation of the epidemic pertussis process in Ukraine at present time from the position of socially ecological conception and improvement of the epidemiological surveillance. Features of serotype-specific view of a causative agent, clinical course of the disease, immunological structure of the population and their influence on the epidemic pertussis process were defined. A reasonability of the use of modern laboratory methods of diagnostics (PCR and ELISA) was demonstrated and the criteria of their rational purpose have been established. The estimation of the system of diagnostics and predictive criteria of epidemic well-being and precursors of epidemic problems were suggested.*

***Keywords:** pertussis infection, epidemiological surveillance, epidemic process, diagnostics, immune structure, vaccinal prevention.*

Introduction. In 1965 the WHO organized the headquarters of the epidemiological surveillance (ES) and recommended that National Health Services use the epidemiological surveillance as the only effective form of the epidemiological process management that enables to fight successfully against infectious diseases with the lowest expense of material resources[1]. Since then, the doctrine of the epidemiological surveillance develops as in the direction of improving the organizational and functional approaches, as in the direction of the development and the applied use of the epidemiological surveillance schemes to deal with definite nosological forms, including pertussis.

The prediction of the morbidity is possible with comparing and analyzing the various manifestations of the parasitic system. Quantitative and qualitative changes of the epidemic process at every functional and morphological level of interaction between the pathogen and the host (human) are displayed on the functioning of all other levels and on the whole epidemic process as on the single integrated system, which is consistent with the socioecological conception of the epidemic process by B.L. Cherkassky [2]. The systematic approach to the study of the epidemic process at all its subordinate levels leads to the necessity for the epidemiological surveillance of

pertussis infection at cyto-genetic, organismic, ecosystemic and socioecosystemic levels.

The standards of the epidemiological surveillance of pertussis infection, proposed by WHO, envisage the recommendations for the clinical disease definition and criteria for laboratory confirmation of it for the registration of each new case of pertussis [3, 4, 5].

The purpose of our study was to develop the ways of improving the epidemiological surveillance of pertussis on the basis of the study of epidemic manifestations of pertussis and system analysis of correlation between various levels of the epidemic process of pertussis infection under present conditions.

Materials and methods of the investigation. Comprehensive study of the relationship between social and biological subsystems in the development of pertussis epidemic process in present conditions was carried out by means of the systemic multivariate epidemiological analysis of pertussis in Ukraine for the last years of the vaccination period (1992-2013).

The analysis included studying the multiyear and annual dynamics of morbidity, its distribution in the social and age groups and certain groups among vaccinated and unvaccinated persons, and identifying indicators of the epidemiological vaccination efficiency on the socioecosystem level

At the ecosystem level the immune structure to pertussis in the population of 5 regions of Ukraine (Kyiv, Sumy, Donetsk, Kherson, Chernivtsi) and factors affecting the level of anti-pertussis immunity were studied. At the organismic level the clinical course of pertussis and condition of laboratory diagnostics were analyzed. In order to improve the laboratory diagnostics of pertussis ELISA was taken to identify anti-pertussis Ig M, A, G, and an agglutination test with pertussis liquid diagnosticum. At the cellular level the circulation of serological variants of Bordetella in the Donetsk region for the period of 1989-2013 was studied.

Epidemiological, serological (ELISA and AR) bacteriological, molecular-genetic (PCR), clinical, statistical methods were applied.

Results and discussion of investigation. With the purpose of the estimation of the accordance of the national system of epidemiological surveillance of pertussis with the WHO recommendations was conducted the analysis of the organization of measures against pertussis and directive documents operating in Ukraine. In our country the necessity of the improvement of epidemiological surveillance of pertussis is present.

The results of study of pertussis epidemic process in Ukraine are presented from the position of the systematic approach.

Epidemiological analysis of long time changes in the incidence of pertussis in the population of different ages and vaccination coverage against pertussis in Ukraine in 2000-2013 showed no trend of the incidence decrease and a low level of vaccination in recent years.

We have analysed the features of distributing of pertussis morbidity in persons of different age and formed «groups of risk» at a pertussis infection. Last years in a long-term dynamics a tendency is exposed to growth. The highest level of morbidity was registered at children under age 1. For the first time the high increase of morbidity of 5-6 years old children was shown, they are considered as a «risk group», formed in a modern period.

The epidemic process of whooping-cough at social-ecological level has a tendency to activation among the children of junior groups of ages.

The analysis of the completeness and timeliness of vaccination coverage against pertussis in Ukraine in 2000-2013 years was performed. The long-term stable high immunization coverage caused long-term stabilization in the dynamics of morbidity of pertussis with periodic increase with no clear dependence on the volume of routine immunization. In 2008-2009 vaccination coverage dropped to 92%. In 8 out of 27 regions timeliness of immunization children was less than 90,0%, which may lead to activation of epidemic process. In the system of epidemiological surveillance it is necessary to improve the monitoring of credible reporting.

Determination of epidemiology efficiency of immunoprophylaxy of whooping-cough in Donetsk region in 1997-2013 showed its high indexes among the children of

preschool age. The substantial decline of efficiency of antipertussis immunization is exposed among schoolboys 7-14 years as compared to the junior groups of ages and previous years. It specifies on multiplying the risk of disease of these persons. In the period of the long-term planned immunization against a whooping-cough it is necessary change the estimation of efficiency of immunoprofilaxy on immunological, clinical, microbiological indexes, it is for what necessary to extend methodical basis of laboratory researches.

High efficiency of long-term planned vaccinal prevention of pertussis was established. It promoted stabilization of morbidity on a low level, prolongation of the cyclic periods, decreasing the differences between the level of morbidity of urban and rural population, changes of levels of age-morbidity.

At ecological level the immunological structure of population is studied to the whooping-cough, the persons of junior school age are considered as a risk group.

The important role of immunological monitoring system for the epidemiological surveillance of pertussis was estimated. In the ELISA for detection of antibodies Ig G class to Bordetella pertussis toxin the state of population immunity against pertussis was studied in the five administrative regions of Ukraine (655 persons) in the north, east, south, west and center of the country. Representative indicator groups of persons aged 2 years, 6-7 years and 18-29 years were examined. The concentration of immunoglobulins expressed in DU / ml - international DRG units. Level of immunity was assessed as high, medium, low, vulnerable persons and seronegative individuals.

State of population immunity against pertussis was low. The total part of seronegative individuals to pertussis amounted to 44,7 % from the number of inspected patients in general in the country and ranged from 21,2 % in Chernivtsi region to 57,5 % in Donetsk region.

The level of immunity to pertussis was significantly different in different regions of Ukraine. The median concentration of pertussis immunoglobulin was 4,7 DU / ml in the Donetsk region, Kherson region – 8,5 DU / ml, Kiev region – 13,9 DU / ml, Sumy region – 17,3 DU / ml, Chernivtsi region – 19,2 DU / ml.

Children 2 years of age have higher rates of pertussis immunity in all areas in the immunological structure. The immunological efficiency of pertussis vaccine was confirmed. Children 6-7 years and adolescents were poorly protected. They are regarded as the age at risk, requiring additional preventive measures. The study of the immunological structure of pertussis in the population of 2, 6-7, 18-29 years age showed that the lowest rates immunity registered in the group of 6-7 years old children. 2-years children were better protected in all regions. Children of 6-7 years and adolescents regarded groups of risk in terms of immunological structure to pertussis. It is necessary to solve the problem of raising the level of immunity among them. The level of immunity adults of reproductive age was insufficient to protect infants.

The impotent value of immunomonitoring is confirmed in the system of epidemiology supervision after pertussis. The resulting data should be used for targeted improvements specific prevention of pertussis.

The study found no trend of the decrease of the incidence of pertussis in Ukraine in conditions of high vaccination coverage, low level of immunity against pertussis, the formation of risk grope among primary school children. The expediency of an implementing of second revaccination against pertussis among children aged 6 years was based upon epidemiological and immunological characteristics.

The influence of the organization of pertussis immunization and the intensity of its epidemic process on the population's pertussis immunity was assessed. A correlation between specific gravity of seronegative children aged 2 in five regions of Ukraine and the number of the vaccinated against pertussis children in 2008-2013 was established. The efficiency of determining the limits of fluctuations in the incidence of pertussis was showed, in cases when the circulation of the pathogen does not provide a "natural immunity increase" and does not affect the level of immunity.

The statistically significant influence factors on the level of antipertussis immunity were established. There are negative factors – a deviation from the regulated scheme, increasing of the period from the last vaccination, carried diseases

in anamnesis; there are positive factors – vaccination at autumn, using of AcellularDTP-vaccines.

An analysis and estimation of efficiency of antiepidemiologics measures in the epidemic focus of pertussis infection was conducted. There are an active exposure of patients by a pertussis, laboratory diagnostics, timeliness of isolation, establishment of reasons of disease's origin, medical looking after communicating in epidemic focus. Imperfect diagnostic possibilities of existent methods of laboratory diagnostic pertussis was shown.

Active detection of patients with pertussis among long coughing persons conducted bacteriological method and reaction of agglutination with paired sera. The small diagnostic capabilities of the methods for laboratory confirmation of pertussis was detected.

The comparative analysis of application of various methods of laboratory diagnostics of a whooping cough (bacteriological, RA) has shown, that at high level of coverage by bacteriological inspection sick of a whooping cough (78,6-85,2 %) and their inspections in agglutination reaction (64,8-88,6 %) frequency of positive results was low (8,6-43,6 %). For the introduction of PCR and ELISA for the detection of specific Ig M pertussis more research studies were performed.

We firstly in Ukraine summarized the experience of the use of polymerase chain reaction (PCR) for laboratory confirmation of pertussis infection in the Donetsk region for 2007-2009. Frequency of DNA isolation of the pertussis pathogen in PCR among the inspected persons of different age correlated with the level of morbidity a pertussis infection. The expedience of wide introduction of PCR for early diagnostics of pertussis infection is shown, because it is an informing and objective method of authentication of the pertussis pathogen.

The using PCR for identify Bordetella pertussis pathogen raises level of diagnostics a pertussis infection: 11,3-53,8 % registered cases in 2007-2009 are confirmed in PCR. By means of PCR Bordetella pertussis are revealed at 26,8 % of persons with long cough.

The modern conditions characterised by increase of frequency of easy and erased forms of a pertussis infection. Wide introduction in practice of health protection of ELISA for determination of specific IgA and/or IgM of antibodies to Bordetella pertussis will enable in good time to diagnose, it is correct to appoint treatment, conduct effective prophylactic measures, that will result in the decline of morbidity a pertussis infection in the and.

For the purpose of early diagnostics of a pertussis infection in the modern conditions the research of use of a method ELISA for revealing antipertussis antibodies Ig M were performed.

Research purpose: to estimate a presence and frequency of exposure of specific antipertussis antibodies of classes of IgM and IgA at persons with somatic pathology of respiratory tracts, showing up a long cough. In ELISA the wheys of 42 persons with different diagnoses were explored. Antibodies to the antigens of Bordetella pertussis (IgM and IgA) is exposed at 33,3 % these persons, including at 23,8 % there were antibodies of class of IgM, at 16,7 % – class of IgA, at 7,1 % both classes of antibodies were present simultaneous. Children in age 3-5 years more frequent than other groups of ages suffer pathology of respiratory tracts, at which differential diagnostics is required with a whooping-cough infection (62 % from all inspected persons). At 27 % from them specific antibodies, testifying to the flowing presently whooping-cough infection, were exposed.

Specific M-antibodies are revealed at 87,5 % of the hospitalised patients with the diagnosis "whooping cough". Use of this method raises possibility of diagnostics of a whooping cough in early terms of disease. Objectivity and informativity this method and expediency of its wide introduction in public health services practice is confirmed.

Analysis of the use of the bacteriological method and reaction of agglutination for laboratory diagnostics of whooping-cough has detected high level of scope of patients by them and insufficient informing of these methods (Table 1). The experience of application of PCR for B. pertussis determination and ELISA for the exposure of Ig M and Ig À testifies to possibility of improvement of epidemiology

supervision after whooping-cough by the improvement of laboratory diagnostics of this disease. The rational choice of the tacticis of laboratory diagnostics of whooping-cough in a period, when the new perspective methods of researches become accessible, depends on age, term from the beginning of disease and inoculative status of diseased persons.

Table 1

Frequency of the confirmation of the diagnosis of pertussis using different laboratory methods (% of examined contingent)

Contingent examined	Bacteriological	PCR	ELISA	RA
Patients with pertussis	**55,6±8,7**	**100,0**	**83,3±8,8**	**58,5±4,9**
Persons with prolonged cough	**3,0±1,2**	**22,6±1,9**	**26,3±5,8**	**2,0±1,2**

At organism level a tendency is marked to the decline of weight of clinical displays of infection. To assess the factors affecting the severity of clinical course of pertussis 192 cases of pertussis that were registered in Donetsk region in 2008-2013 have been analyzed. The most influential factor according to mathematical model definition is vaccination against pertussis that the patient received earlier. The analysis of the infectious course of pertussis revealed the “risk groups” of severe clinical forms of infection, demonstrated that vaccineal prevention allows to make the clinical course of the disease easier, and confirmed the existing defects in the organization of vaccination.

At cellular level features of serotype-specific view of a causative agen were defined.

The analysis of Bordetella species circulation in the Donetsk region in 1989-2013 (Table 2) showed predomination of B. pertussis (83,2 %). Lately, frequency of B. parapertussis circulation grew to 14,6 %. Serotype 1.0.3 prevailed among pertussis agents (53,5 %), a tendency to reduction of its circulation and increase of all other serotypes of B. pertussis is exposed. On the second place by frequency of selection there was the variant 1.2.3. The tendency to the coincidence of his activation with epidemic morbidity rates of whooping-cough is revealed. Monitoring of the serotype landscape of B. pertussis is an important component of pertussis epidemiological supervision.

Table 2

The prevalence of pathogens in the genus Bordetella in Donetsk region in 1989-2013 (% of identified microbial cultures)

Years	Allocated pathogens kind Bordetella	Including Bordetella species (% + m)						
		Bordetella pertussis					Bordetella parapertussis	Bordetella bronchi-septica
		Total	Including serotypes					
			1.0.3	1.2.3	1.2.0	1.0.0		
1989-1996	214	95,3±1,4	79,9±2,7	10,7±2,1	2,8±1,1	1,9±0,9	4,2±1,4	0,5±0,4
1997-2004	241	87,1±2,2	48,1±3,2	21,6±2,6	6,6±1,6	10,8±2,0	12,5±2,1	0,4±0,4
2005-2013	298	69,8±2,7	37,9±2,8	17,1±2,2	5,0±1,3	9,7±1,7	23,5±2,5	5,0±1,3
1989-2013	753	83,2±1,4	53,5±1,8	16,8±1,4	4,9±0,8	7,9±1,0	14,6±1,3	2,3±0,5

Spreading of the pertussis agents serological variants among persons of different ages had different. Relative density of the pertussis pathogen serological type 1.0.3 is the largest. The tendences to reduce its circulation from 79,1% to 56,1% and to increase the relative density of the pertussis pathogen serological type 1.2.3 from 12,4% to 24,9% are exposed. The dependence is revealed in the dynamics of incidence and spreading of serotype B. pertussis, which was to change the dominant serotype in front of each subsequent epidemic rise.

Exploration of the prevalence of different types Bordetella and the incidence of whooping cough persons of all ages showed correlation of these processes. A mathematical model to predict trends of disease based on the assessment activity circulating serological variants of the pathogen made.

The control of pertussis epidemic process needs perfection. We have proposed the basic principles of organization of the surveillance system for pertussis infection. Developed a diagram showing the structural-functional model of the surveillance of pertussis infection. It includes measures for pertussis infection, based on the specifics of the infection and the principles of a systematic approach to the epidemic process. The essence of the model is to determine the relationships between the fragments of the functioning of medical and sanitary-epidemiological measures, the regulation of volume and content of information flows, diagnostic and management approaches to solving problems of prevention of pertussis.

Conclusions. Priority ways of improving the system of epidemiological surveillance were worked out; reasonability of the use of modern laboratory methods of diagnostics (PCR and ELISA) was demonstrated and the criteria of their rational purpose have been established. The estimation of mathematical prognosis of prediction the tendency of morbidity on basis of circulating serotypes of causative agents, the system of diagnostics and predictive criteria of epidemic well-being and precursors of epidemic problems were suggested.

On the basis of deep epidemiological analysis the system of diagnostically-prognostical criteria of estimation of pertussis epidemic processes tendency is offered by the purpose of increase of the functioning of epidemiology supervision after a whooping-cough. Criteria are grouped in the signs of epidemic prosperity and precursors of epidemic nonprosperity and engulf all functionally-morphological levels of epidemic process.

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Романенко Т.А.

Епідемічний процес кашлюку в Україні та епідеміологічний нагляд за ним в сучасних умовах

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Резюме. Стаття присвячена вивченню епідемічного процесу кашлюку в Україні в сучасних умовах з позиції соціально-екологічної концепції та удосконаленню епідеміологічного нагляду. Визначено особливості серотипового пейзажу збудника, клінічного перебігу хвороби, імуноструктури населення та їх вплив на епідемічний процес. Продемонстровано доцільність застосування сучасних лабораторних методів діагностики (ПЛР та ІФА) та визначено критерії їх раціонального призначення, запропоновано систему діагностично-прогностичних критеріїв епідемічного благополуччя та передвісників епідемічного неблагополуччя.

Ключові слова: кашлюкова інфекція, епідеміологічний нагляд, епідемічний процес, діагностика, імунологічна структура, вакцинопрофілактика.

Романенко Т.А.

Эпидемический процесс коклюша в Украине и эпидемиологический надзор за ним в современных условиях

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Резюме. Статья посвящена изучению эпидемического процесса коклюша в Украине в современных условиях с позиции социально-экологической концепции и усовершенствованию эпидемиологического надзора. Определены особенности серотипового пейзажа возбудителя, клинического течения болезни, иммуноструктуры населения и их влияние на эпидемический процесс. Продемонстрирована целесообразность использования современных лабораторных методов диагностики (ПЦР и ИФА) и определены критерии их рационального назначения, предложена система диагностически-прогностических критериев эпидемического благополучия и предвестников эпидемического неблагополучия.

Ключевые слова: коклюшная инфекция, эпидемиологический надзор, эпидемический процесс, диагностика, иммунологическая структура, вакцинопрофилактика.

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"BLACK FLAG" OF 1892: CHOLERA EPIDEMIC AND THE PROBLEM OF KHARKIV PROVINCE PEASANTS ATTITUDE TO MEDICAL CARE

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Abstract. *The problem of an attitude to medical care of peasants of the Kharkiv province in the late 19th – early 20th century on the example of their reaction on anticholeraic measures of 1892 has been considered in the paper. This work belongs to the historical direction of everyday history that became topical due to the humanization of research, the transition to human-centered history. The set of measures and its practical result, the response of population, peasantry prejudices on a health care has been discovered on the basis of historical sources. The main trend was a fear of doctors and hospitals, refusal of treatment by the part of peasants. The conclusion has been made that the peasants lived in the world of myths, not rational knowledge, so the rumors outweighed doctor's instructions. Medic was a stranger for them which had no trust. Extremely low cultural level of population contributed to anti-epidemic measures sabotage.*

Keywords: *peasants, everyday life, health care, behavior, cholera, epidemic*

Epidemic diseases in late 19th – early 20th century were a regular phenomena. It was particularly evident in the countryside, where the level of medical knowledge and common culture of the population had been extremely low. In 1892 cholera hit the villages of Kharkiv province, that became an illustration for specific behavior of peasants inherent throughout this period.

Historiography of the topic is not wide. Primarily, the provincial capital was studied. In the imperial period it was reflected in the D. Bahaliy's and D. Miller's work and in the modern era by I. Robak. Therefore, the work is based on sources that deposited in funds of the Kharkiv provincial zemstvo council. Mostly, this is a paperwork documentation which has a reportal character.

First of all, lets note that since 1879 all the peasants had a duty to imform the administration about epidemic diseases. It was forbidden to use possibly

contaminated things. Disinfection of houses and limiting access of outsiders were provided. It was also advised not to leave unattended even the slightest disorder of stomach in cholera time, to drink tea with lemon or 10 drops of hydrochloric acid, eat only fresh food, etc. Instruction was provided how to deal with the people with symptoms of cholera. Also measures were described how, following sanitation, not to be infected for caretakers. Meetings at funerals and commemorations etc. were banned. Detailed advertisments with the explanations how to combat cholera were hunged out [1, 6-36]. Districts had its own sanitary rules, that beared no practical result [2, 5-30].

But it was not was kept by the peasants. Rules caused negligible effect on public health. The main reasons were low cultural level of population and indifference to the sanitary requirements, lack of control by the police and sanitary caregivers. Almost all the rules were violated. It was possible to achieve only that majority of people have not threw garbage near the wells [2, 31-32].

The appearance of cholera was accompanied by riots among uneducated peasants [3, 1]. Even in 1890-ies “cholera riots” has occurred in some areas [4, 3]. The eyewitness of the 1892 epidemic in Kharkiv province wrote about peasants’ behavior, “they will go neither in barracks nor in tents and will destroy it the same way” [3, 18]. The hospital houses in villages were not equipped enough, and relatives did not want to send there patients. The villagers did not trust hospitals because they had never seen it and was unfamiliar with its milieu. To put people here, using force, was inconvenient and even dangerous. This organization was ineffective, so treatment was provided mostly at home [5, 73]. For example, villagers of Vovchansk district considered that “if the ill person will die, but at home, not in plague house” [5, 194].

The problem of cholera has been associated with cultural development and poverty [3, 6]. Especially favorable conditions for it were in the yards of the poor, because, as doctors asserted, poverty and dirt contributed to it greatly. Almost all of them were ill, the mortality rate was the highest, for example, from 6 family members 3 died [5, 50-51]. All instructions for care about ill people and themselves were

nothing in the conditions of deeply rooted habit of population to a lack of sanitation. Hand washing was not carried out for weeks, and if carried out, without a soap. All the claims about the patients' diet ignored or discarded at the first sign of relief. It caused unnecessary deaths. If it was no natural immunity, the quantity of cholera victims in such circumstances would have been a huge number [5, 28-29]. But after previous infection peasants immediately corrected their behavior, unkempt villager Krasnokutskiy, who had been hiding before and wanted no medication, drank water only from a samovar [5, 189].

The peculiarity of a cholera epidemic was that a black flag hunged out on the gate of each household, where ill people were. It was taken away only after disinfection and doctor's permission. Pillars with these flags and local police posts were being installed on the roads to the village [5, 19]. It was called under the question by doctors that hanging of black flags increased peasants' depressed mood. The reason was simple. In their opinion, those, who asked dying people to convey the news to deceased relatives, could not be afraid of black flags [5, 72]. As for the designation of buildings with patients, the population did this with reluctance, and signs were removed next day, because it was considered like something "shameful" [2, 32-33]. In addition, lower police officials supported distrust of people to measures, so insulation was conditional. Negligence of one person could make it possible for the infection to spread throughout the village in few minutes [5, 83].

The population was not able to recognize diseases, so it was usually not reported on. Such data could be provided only by outpatient clinics and medical staff. Things of infectious patients in reality were selling and gifting, it was impossible to prevent it. Disinfection after patients were not carried out, excepting cases when country doctor knew about the illness [2, 32-33]. People were slow to inform the doctor about the epidemic even if the whole neighbor family was ill. Typically, the first cases of epidemic diseases have been discovered in the ambulatory or during home visiting [6, 54]. In Vovchansk district relatives concealed patients, hindered the treatment and disinfection. Consequently, the second medical district there had 42 deaths from 80 ill people [5, 134].

Local authorities from peasants could organise antiepidemic measures with great difficulty in the reasons of disorganization and luck of education, but they knew well that doctor can not punish for it [5, 71-83].

Here is an example of the epidemic, which spreading was caused by the ignorance of villagers. In 1892 cholera entered the village Mykhailivka in Valky district with workers who were returning from the Black Sea region. Infection was not recognized in time, and both were infectioned: those who brought the patient and those who looked after him. It became clear that it was cholera only after the death of the patient and disease of 6 people. 10 residents of neighboring houses in the middle of the village falled ill. Warnings were explained, the doctor came to the village every other day or every day. Disinfection of homes, burning or clothes were done. It was forbidden to launder in the pond. Warding was on duty near the infected households, the village fell under the quarantine according to the resolution of governor. In total, 18 people fell ill – 33% of the village population, 6 died [5, 2].

Attitude to health care at first was very suspicious and ignorant. This was reinforced by the fact that sometimes patients were recovering themselves without or with minimal treatment. Doctors were never sure about the exact adherence to their prescription, even after gaining the trust of patients during the second phase of the epidemic, which was accompanied by their relief. In many cases left medicines were not taken by peasants [5, 38].

In the village Oleksiivka contrary to priest's prescription family of deceased held a commemoration. Half of the 20 guests died of cholera. The epidemic started to spread quickly. 243 people became ill, 88 died. The total population was 1200 people, so 12 % became ill [5, 61]. In the settlement Thernova peasants followed doctor's personal claim not to hold commemorations, agreed on disinfection, but doubted in its necessarity [5, 152].

Going by train with someone who has had diarrhea and nausea, peasant managed to use his tableware. As the result, he died, his son suffered the same fate, and in village Shebelinka 22 people falled ill, 6 of them died. Soon, 8 people who lived on the same street, became ill and died [5, 62].

Villager Siryi, wanting to do Lenten Retreat and communion, conceal his illness for 3 days, which has led to a new outbreak among people, who did it with him. In total, 50 falled ill and 25 died [5, 63].

Treatment viewed as private restriction and excessive care, because peasants believed that there were no cholera. And if the patient feels worse as the reason was considered the powder given by a medical assistant. With this attitude a strict isolation and disinfection were impossible. The result was regular [5, 45-46]. By the way, in some cases, a long-standing hostility between neighbors prevented communication and played a positive role, because it guaranteed protection from the infection [5, 52-53].

To convince the rural community of village Lyhynivtsi in Lebedyn district the case of ill boy Kuzma Pashchenko was used, who due to the hopeless condition was not treated. The doctor explained to neighbors that the boy died without the treatment, and that was not the reason of death. The doctor advised family members to move away immediatly to the barn to avoid infection. But people did not believe him. As the result, mother and sister dead too. Finally, the village community was persuaded in the contagiousness and danger of the disease, trust to medics emerged [5, 47].

Doctors noted, that whole families falled ill, or one person remained. Woe of people who survived and endured the death of loved ones was terrible. Encumber them by disinfection was considered inappropriate. Medics did it. For expensive items, such as fur coats, caution was necessary. It was washed by mercuric chloride and ventilated. Villagers sometimes demanded a payment for burned things. The accumulation of old rags by poor peasants for bed impeded disinfection. The patient was surrounded by a bunch of junk that was subject for disinfection. But for peasant it were valuable things. Villagers concealed it to avoid damage by aidmen [5, 12-18].

In the village Balakliya peasants were hostile towards sanitation and treatment, concealed cholera patients. They were sure of the veracity of rumors that it was decided to slack off ill people for a termination of the epidemic. Villagers saw the proof in the incident, when the doctor, despite the request of relatives, gave medicine to the girl who already was in agony. She died. And her father, who refused the

medication, recovered. Therefore, it was assumed, that the doctor poisoned the girl. In the same way peasants poorly treated to the medical care in the village Borshchove, first patients were put to hospital-house using force [5, 65-66]. Patient from village Pryhorodne accused doctor in poisoning, because he had no nausea before receiving powder, and died saying it. Rumors distributed quickly. For the doctor, who treated those people for 12 years, these accusations became depressing. But after the epidemic hospital was besieged by patients,who wanted help, again [5, 185].

Patients in Balakliya flatly refused to take drugs, and relatives created obstacles. They have been said, "medicines it is not necessary, if this is God's will, he will take him". Coming of a doctor to the found patient made the last one afraid near to the death. Even comparatively educated parish clerk asked not to give medicines to his mother. Zemstvo health care in Balakliya had never enjoyed the trust, and at the beginning of the epidemic peasants started to feud with local medical assistant [5, 65-66]. Rumors spoke about trumping up of cholera for doctors' personal purposes, scalding of patients by hot water, so on [5, 276]. It had its roots in the first half of the century, when in 1830 in Kharkiv the rumors about deliberately poisoning of wells and burying people alive were spreading. Local doctor was almost killed by angry crowd [7, 98]. But then it has happened in the town. At the end of the century prejudices became the specifics of rural areas. In 1892 in Kharkiv it was not observed in significant scale, and due to the taken measures epidemic had no scope. But harboring of ill people by residents was continued because of ignorance and distrust to the health care [8, 151-154]. The most vulnerable were the poorest and the most uneducated strata of the population, generally former villagers.

Doctors tried to fight against the ignorance and superstitions. Popular lectures on cholera were conducting in all villages of the 7th medical district of Zmiiv district, interlocutions with patients and also were doing. The doctor evaluated their effectiveness as high. After it peasants oversaw and reported about diseases, transmitted information heard from the doctor. Dark rumors disappeared [5, 80-81].

In some cases, depending on the locus, the situation could be radically different. For example, in the village Raiiske peasants proclaimed no protest, there were no

refuses of treatment, and even with the least ailments they contacted the doctor [5, 59]. In the village Volokhiv Yar population reacted to the actions of the medics with trust. Patients completely submitted, and even the neighbors asked to carry out disinfection. For this situation epidemic personnel should be grateful to the local medical assistant who had great trust [5, 64]. In the village Bryhadyrivka peasants willingly contact the doctor, there were no hiding of patients. Every day to the seconded student came several people to ask an advice, all the instructions were exactly performing [5, 109]. In the settlement Hryhorivka near the Kharkiv population trusted the doctors, took predesignate medication neatly, was agree to move to the hospital. The population of the 3rd medical district in Valky district did not interfere disinfection, excluding rare cases of disaffection. They did not like black carbolic acid, but to other measures their attitude was normal [5, 246-253].

The nurses of mercy had between the villagers great trust. Sometimes peasants were agree to go to the hospital only if they will care about them [5, 22].

Local junior medical personnel was assigned to care about peasants. They had trust, so it could do powerful influence on the formation of medical consciousness [5, 82]. In the village Therny old woman demanded to be treated by the local medical assistant, because young medical assistant “has gave too much drugs” [5, 153].

Priests promoted antiepidemic measures among the rural population [9, 41]. They played a great role in supporting people and raising by their explanations the authority of health care. Doctors also explained how people can protect themselves from infections. In some cases, this measure was very effective [5, 68-72].

For example, on the village meeting in Therny doctor, priest and administration argued, that the population was infected by cholera, its infectiousness and great mortality from it. It was also discussed how to care ill people and what to do. But only well known reputable doctor could convince people in the necessity of taking action [5, 154-163].

In the conclusion, we should say, that the main reason for the ineffectiveness of antiepidemic measures was that peasants lived in the world of myths, not of rational knowledge. This is the root of the most incredible superstitions. Medical staff was

viewed as an alien from the city – culturally different world. In this reason, misunderstanding, accuses of attempting to harm were presented. Villagers trust those who was known in their locus, and who proved his rightness. But generally it was an exception in that conditions. Low cultural and educational level of the population contributed to the spread of rumors and superstitions.

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Альков В.А.

«ЧОРНИЙ ПРАПОР» 1892 р.: ЕПІДЕМІЯ ХОЛЕРИ ТА ПРОБЛЕМА СТАВЛЕННЯ СЕЛЯН ХАРКІВСЬКОЇ ГУБЕРНІЇ ДО МЕДИЧНОЇ ДОПОМОГИ

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Резюме. У статті розглядається проблема ставлення селян Харківської губернії до медичної допомоги наприкінці XIX – на початку XX ст. на прикладі їх відношення до протихолерних заходів 1892 р. Дана робота відноситься до історичного напрямку історії повсякденності, що актуалізувався в зв'язку з гуманізацією досліджень, переходом до людиноцентричної історії. На основі джерел досліджується сукупність заходів та їх практичний результат, реакція на них населення, забобони селянства щодо медичної допомоги. Загальною тенденцією був страх перед лікарями й лікарнями, відмова від лікування. Зроблено висновок про те, що селяни жили в світі міфів, а не раціонального знання, а тому чутки були для них вагоміші, ніж лікарські настанови. Медпрацівник був для них чужинцем, якому не довіряли. Саботажеві протиепідемічних заходів населенням сприяв його вкрай низький культурний рівень.

Ключові слова: селяни, повсякдення, охорона здоров'я, поведінка, холера, епідемія

Альков В.А.

«ЧЁРНЫЙ ФЛАГ» 1892 г.: ЭПИДЕМИЯ ХОЛЕРЫ И ПРОБЛЕМА ОТНОШЕНИЯ КРЕСТЬЯН ХАРЬКОВСКОЙ ГУБЕРНИИ К МЕДИЦИНСКОЙ ПОМОЩИ

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Резюме. В статье рассматривается проблема отношения крестьян Харьковской губернии к медицинской помощи в конце XIX – начале XX в. на примере их реакции на противохолерные мероприятия 1892 г. Данная работа относится к историческому направлению истории повседневности, которое актуализовалось в связи с гуманизацией исследований, переходом к человекоцентричной истории. На основе источников исследуется совокупность мероприятий и их практический результат, реакция на них населения, предрассудки крестьянства относительно медицинской помощи. Общей тенденцией был страх перед врачами и больницами, отказ от лечения. Сделан вывод о том, что крестьяне жили в мире мифов, а не рационального знания, а потому слухи были для них весомее, чем врачебные предписания. Медработник был для них чужаком, которому не доверяли. Саботажу противоэпидемических мероприятий населением содействовал его крайне низкий культурный уровень.

Ключевые слова: крестьяне, повседневность, здравоохранение, поведение, холера, эпидемия

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THE WORK OF PROFESSOR OF FORENSIC MEDICINE N. S. BOKARIUS IN THE FIELD OF THE RESEARCH OF PHYSICAL EVIDENCE

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***Abstract**. The article is devoted to the activity of the outstanding scientist and medicolegist Nikolay Sergeyevich Bokarius. The article considers the work of N. S. Bokarius on the study of physical evidence. The fundamental scientific works of N. S. Bokarius were analyzed. They contained many new at that time concepts on research of physical evidence.*

***Keywords:** forensic medicine, criminalistics, physical evidence.*

Medicolegists - outstanding scholars and practitioners made significant contribution to the history of the formation and development of forensics and criminology. However, the medicolegist and criminologist, Emeritus Professor N. S. Bokarius occupies a special placein the development of forensics and criminology.His works were in fact the first textbooks and practical guidance on criminology for employees of inquiry, investigation, forensic experts.One of the main directions of scientific activity of N. S. Bokariuswashis work in the field of the research of physical evidence.

The aim of this article is to analyze scientific works of N. S. Bokarius devoted to the study of physical evidence to present the total value of the contribution of the scientist in the development of one of the most important issues for forensics.

N. S. Bokarius was born in 1869 in Odessa. After graduating from a high school in 1890 he entered Medical Faculty of Imperial Kharkov University, which he brilliantly graduated in 1895. As a student, N. S. Bokarius became interested in forensic medicine, in particular, he was interested in the study of physical evidence [1, 81].

In 1897 N. S. Bokarius started working at the Department of Forensic Medicine of Kharkov University. In the first years of work, he held a number of studies on the reaction of Florence, publishing his observations in Russian and

German magazines in 1900 - 1902. The result of this work was the doctoral thesis of N. S. Bokarius about "Florence's Crystals, their chemical nature and the value for the forensic medicine", which he defended at Moscow University in 1902 [2, 9].

His thesis N. S. Bokarius devoted to the determination of the chemical nature of Florence's microcrystals which are formed in aqueous extracts of "similar to seminal stains" mixed with iodine solution in potassium iodide. This reaction caused considerable disagreement among scholars as to its use as a sample of evidence for the presence of human sperm [3, 17].

In connection with the instability of Florence's Crystals, N. S. Bokarius developed methods of receiving them in quantities, sufficient for analytical purposes. In the matter itself he determined choline, which is formed during the decay of lecithin, widespread in the nature, especially in animal cells and plant bodies. As a result of his research N. S. Bokarius came to the conclusion that Florence's reaction is not specific for semen, so an expert in this case should not rely solely on this evidence of the guilt of a defendant, so Nikolay Sergeevich was able to give an affirmative answer to the existing at that time disagreements between scholars about the demonstrative value of Florence's Crystalls during analyzing the seminal stains [4, 10].

In 1907 continuing the observations in the study of seminal stains, N. S. Bokarius published a work "On the microchemical reactions to the semen," in he which criticized the reaction of Barberio and offered his own reagent to produce crystals. These crystals are known in the literature as crystals of Bokarius [5, 19].

At the same time Nikolai Sergeyevich is working on a relatively new at the time question of determining the type of blood by hemoglobin crystals and in the work, published in 1902, he indicates that the best and more resistant hemoglobin crystals are obtained by adding to themacacia. In the same work N. S Bokarius first describes hemoglobin crystals of birds' blood [6, 13].

One of the most significant works of N. S. Bokarius in the study of physical evidence was his work "On the Importance of strangulation furrow at hanging", which was published in 1904. Nicholay Sergeevych devoted this work to the

microscopic diagnosis of a strangulation furrow at hanging. The author paid attention to the differential diagnosis of in vivo and posthumous character of the strangulation furrow, where one of the main signs, he believed, was peculiarity of the blood supply of the area of soft tissues at the place of strangling. Judging by the analysis of scientific research conducted by the scientist, the question of differential diagnosis of in vivo and posthumous character of the strangulation furrow was poorly investigatedand particularly relevant, and works on this subject had been published mainly abroad. N. S. Bokarius described peculiarities of blood distribution in a strangulation furrow, which allowed to differentiate clearly its in vivo character. In addition, he developed a methodology for the study of furrows, which later became known as "Bokarius's test" and is widely used by forensic experts nowadays [3, 22].

It should be emphasized that this work, as well as many other works of N. S Bokariuswas characterized by a deep scientific analysis of works on the subject, made earlier by other scientists.NikolaySergeevich gathered a huge library of world literature on forensic medicine and criminalistics, which, along with knowledge of 17 foreign languages helped him in a thorough analysis of the literature [2, 10].

The great importance which N. S. Bokarius attached to work with physical evidence, is demonstrated by the fact that his first significant work as the head of the University Department of Forensic Medicine, he devoted precisely to this subject, by publishing in 1910 a guide for physicians, pharmacists and students - "Forensic microscopical and microchemical study of physical evidence." [3, 25]. In the epigraph to this paper N. S. Bokarius wrote: "In order to facilitate the work of those who will have to deal with this kind of research, I decided to release the present book - the first experience of such work in our literature."[7, 2] In this guide with comprehensive at that time completeness were represented the rules for the use of the microscope and spectroscope, use of microscopy in forensic practice at the study of a wide range of objects as physical evidence, many of which have not lost their importance at the present time. Although N. S. Bokarius called his book a guide for doctors, students and pharmacists, it also helped a lot to investigators. It examines the methods of research not only of traditional forensic objects (blood, saliva, seminal

stains, hair), but also objects related to medicine, in particular plant fibers.The author did not leave aside the organizational aspect of microscopical and microchemical research of physical evidence as well.For a long time it was the only guide for the forensic examination of physical evidence and was required to read by everybody who worked in this area [4, 11].

In 1913 and 1914.N. S. Bokarius published works in which he proposed a new method for producing Teyhmann's crystals at the study of blood stains[5, 18].

In 1915 N. S Bokarius offers his own reagent to form a solution of hemochromogen at the study of blood stains[4, 11].

Paying great attention to the study of physical evidence in order to facilitate the work of the students at the study of this section in 1916, N. S. Bokarius published separate editions of "Guidance for practical work ..." to study blood stains, hair, fibers and feathers [2, 10].

Throughout his long-term activity N. S. Bokarius performed about 5000 examinations on research of physical evidence. In his work the scientist held the opinion that only the experience of the practical activity is not enough to prove conclusions on this or that matter. Every phenomenon, every fact must be studied scientifically and, where possible, confirmed experimentally. Only data derived from accurate observations, experimental studies and practical cases can serve as a basis for a conclusion on various issues of forensic practice[5, 19].

Scientific works of N. S Bokariuson the research of physical evidence have become an invaluable heritage of his fruitful scientific activity. They have left their mark in the educational and medical literature to the present day, contributed to the development of forensic medicine and criminalistics, provided invaluable assistance to the law enforcement bodies in solving crimes against life and health of the individual.

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Семененко Е.В.

Работа профессора судебной медицины Н. С. Бокариуса в области изучения вещественных доказательств

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Резюме. Статья посвящена деятельности выдающегося ученого судебного медика и криминалиста Николая Сергеевича Бокариуса. В статье рассматривается работа Н. С. Бокариуса по изучению вещественных доказательств. Проанализированы фундаментальные научные труды Н. С. Бокариуса, в которых содержатся многие новые на то время концепции по исследованию вещественных доказательств.

Ключевые слова: судебная медицина, криминалистика, вещественные доказательства.

Семененко О.В.

Робота професора судової медицини М. С. Бокаріуса в галузі вивчення речових доказів

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Резюме. Стаття присвячена діяльності видатного вченого судового медика і криміналіста Миколи Сергійовича Бокаріуса. У статті розглядається робота Н. С. Бокаріуса з вивчення речових доказів. Проаналізовано фундаментальні наукові праці Н. С. Бокаріуса, в яких містяться багато нових на той час концепцій з дослідження речових доказів.

Ключові слова: судова медицина, криміналістика, речові докази.

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WHEN THE LOCAL HISTORY ACQUIRES THE WIDER MEANING: REVIEW OF THE BOOK "THE HAZARDS OF URBAN LIFE IN LATE STALINIST RUSSIA: HEALTH, HYGIENE, AND LIVING STANDARTS, 1943-1953" BY DONALD FILTZER

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Abstract. *The book of British researcher Donald Filtser is an interesting example of how to examine a specific problem to make conclusions which not only solve it, but go beyond raising broader questions and creating a continuity in historical studies of different levels – from to intersubject. The author of this paper considering the key factors that affected the living conditions of the inhabitants of Soviet cities, comes the paradoxical conclusion that a lagging in living conditions in the USSR behind Western Europe, chronic underfunding of the destroyed urban infrastructure the Soviet regime achieved significant progress in curbing infectious diseases and reducing mortality. But the main conclusion of the author is to clarify how the nature of the Stalinist economic model influenced the character of redistribution of public investment in favor of a heavy industry which led to a chronic underfunding of a public health and urban infrastructure. The author makes the original conclusions which will be valuable to anyone who interested in the history of the Soviet Union.*
Keywords: *The late Stalinist Russia, working history, water supply, urban sanitation, infant mortality, waste growth.*

Feeling a scarcity of studies of the Ukrainian authors on the history of health care and, especially the Soviet health care (here I could mention works of the Ukrainian researchers I. Robak [2], A. Demochko [3], Y. Barabash [4], I. Tkachenko [5]) was a pleasant surprise to come across the book of the British historian Donald Filtzer "The Hazards of Urban Life in Late Stalinist Russia: Health, Hygiene, and Living Standards, 1943-1953". Written in a simple understandable language, full of rich factual material and considering industrial regions of the USSR the book introduces broad conclusions that are rare to find in the works of local historians of post-Soviet countries. So what is this book about? As the author says: "Present book investigates how people lived in Russia's towns and cities during the late Stalin period, in particular how the working class lived". Focus of the research is understandable if we take into account that Filtzer is a specialist in the social and

working history of the USSR and his five previous books dedicated to the investigation of the life of workers throughout almost the all Soviet history. But what make this book interesting and useful are the author's large-scale conclusions about why the social sphere was on the sidelines during the existence of the USSR while the state focused on the development and funding of a heavy industry.

The book consists of five Chapters dedicated to the five different factors which influenced the health, duration and quality of life and labor of ordinary Soviet urban residents: the problem of keeping cities and towns clean; the problem of water supply; personal hygiene and anti-epidemic controls; diet and nutrition including the impact of the 1947 famine on hinterland regions; and infant mortality as a good indicator of a society's general state of health and well-being.

The book is based on a wide field of sources on the history of the Soviet healthcare main of which are: medical reports on public sanitation and public health; demographic data; and data on diet and nutrition. The author relied on several main types of documentation: annual reports of the local offices of the State Sanitary Inspectorate; the files of the RSFSR Ministry of Health and the Ministry of Health of the USSR; medical dissertations, articles, and monographs held at the Central Scientific Medical Library in Moscow; demographic and nutritional data from the Central Statistical Administration and the Statistical Administration of the RSFSR.

Thereby the base of work is composed of statistical sources which, according to the author, don't give to see real human actors. As the author says this "…book about the way that people lived, but there are no people in it. Individuals, their accounts of their daily experiences, or the actions they took in response to them are totally absent. This is in the nature of the documentation" [1, 17]. So the book of Donald Filtzer does not belong to the so popular now in post-Soviet countries "everyday history". Instead advantage of the book is that the documentation which the author used "…allows us to study investigated regions of the USSR longitudinally, from the final years of the war until the first years after Stalin died" and come to broader and general conclusions [1, 11].

The fact that the author has a personal experience of living in the USSR during Brezhnev and Gorbachev and studying of Soviet archives for a long time adds to this book value and certainty. This fact gives him a reason and right to accurately characterize informative content and specificity of the Soviet archival sources, their unreliability which was determined by the system of the Soviet clerical work which not always coincided with a reality. For example according to the author "the GSI [State Sanitary Inspectorate] reports cannot pretend to… frankness of discussion and analysis, or reliability of statistical data" [1, 15]. He continues: "Prior to access to archives, published data were always suspect because of strict censorship over which figures could be put in the public domain and which should remain secret… In fact, secrecy went far beyond what could and could not be published. It plagued all branches of the medical establishment and directly impeded their work… As one sanitary physician complained in 1946, "We garner more information from the journals of England or the United States than we have concerning Ivanovo oblast" [1, 17-18]. The quality of this book shows that cited situation is relevant for researchers of the Soviet healthcare even in modern Ukraine.

As an eloquent example of inaccurate data which Soviet archival sources contain the author gives the following one: "…deaths and births were not always accurately registered, and there were discrepancies between the figures recorded by different data-gathering bodies" [1, 17-18].

The most important thing that the author starting from such unreliability of the official Soviet archives formulates a methodological way for researchers of Soviet history: "… we most definitely can try to unravel some of the mysteries the data contain and, more importantly, attempt to discern general trends and movements" [1, 19].

Except an analysis of archival sources the author gives useful overview of the Western historiography of the Soviet healthcare history. He cited very thorough studies in English [6] including works about the post-war reconstruction of Soviet cities two of which related to Ukraine – Sevastopol' [7] and Kyiv [8].

According to the author, his work does not reveal the broader political, economic and social contexts which in my opinion is not quite true. In general the author modestly assesses his achievements within the research [1, 3]. However, this does not prevent the author make the ambitious conclusions that go beyond the designated research problem of the living conditions of Soviet citizens in the late Stalinist period.

Focusing on the hinterland which weren't touched by the war destruction or were in part, as Moscow or Kharkiv oblasts, the author brings us close to analyzing specific attributes of the urban life that were endemic to the Stalinist system as a system, features that were masked by the vast physical destruction during the war in the case of occupied territories.

The author reaches a comprehensive understanding of the key problem how the Soviet authorities managed to restrain the outbreak of infectious diseases and reduce overall mortality in the short term in the devastated country without investing money in the modernization of social sphere, comparing the experiences of the different regions, and the situation within each region between its major industrial center and the small industrial towns in its surrounding oblast.

The author concludes that most Russian hinterland industrial cities and towns lacked basic sanitation and even large cities had limited sewerage systems which however did not extend to the majority of the population [1, 337]. "Cities and towns alike relied on semiannual cleanup campaigns to empty cesspits and remove the mountains of waste" [1, 338].

The author continues that Soviet cities suffered the problem of water supply. Despite on the large cities and many smaller industrial towns had centralized water supply, very few people lived in buildings with indoor plumbing. "People had to fetch water from street pumps and then haul it in buckets back to their flats… Buildings with running water suffered from periodic cutoffs and lack of pressure. Even where cities possessed sewage treatment plants… these lacked equipment, spare parts, and chemicals to treat the full volume of liquid wastes passing through them. Vast amounts of raw sewage therefore went untreated (or at best, undertreated)

into rivers, lakes, and ponds. An even greater hazard were industrial wastes, most of which factories discharged untreated into open bodies of water" [Ibid].

These conclusions fully coincide with the data on Kharkiv with these problems remained unresolved in the next decades during Khrushchev and Brezhnev periods.

Speaking about the problem of personal hygiene and access of people to clean water to keep themselves clean the author makes the conclusion that providing sanitation measures in conditions of "the limited facilities and supplies that were available, what concerned officials was not the comfort of the population, but the risk of spreading disease…". In this case the author makes interesting add to the facts that I found in the archival documents namely that "official policy was to prioritize access to bathhouses and "sanitary processing stations" among those who posed the greatest public health risk of harboring and spreading lice, most notably young workers or students living in crowded dormitories, who received regular "sanitary processing" of both themselves and their clothing".

But what derives from these interim factual findings and is theoretically important are two big general conclusions of the author which at the first sight seem to contradict each other. One is that successful sanitary measures of Soviet authorities in preventing outbreaks of serious epidemics and reducing mortality showed positive features of the Stalinist totalitarian regime in mobilizing resources and people to conduct public campaigns on identification, isolation and treatment of infectious patients [1, 339; 342]. Not surprisingly that in this context the success of finding patients and their isolation overlaps with general police character of the Stalinist regime.

The other important conclusion is a contradiction itself which lays in the fact that with the successful sanitary measures of the Soviet leadership in the early postwar years later approach to combat diseases remained unchangeable while appeared the new challenges required new approaches: "This early postwar success, however, also contained within it the core of at least some of these long-term problems. The country's approach to disease prevention did not fundamentally change. It still relied on disease control, rather than creating conditions that would

have allowed improvements in health and longevity comparable to those enjoyed in industrialized… capitalist countries" [1, 342]. Reason of this unchangeable approach was an extreme difficulty in frames of the Stalinist system of economic management, planning and production to direct funds to essential development and modernization of social sphere and public health which were doomed to stay in minor positions among the priorities of the Soviet leadership not only during the post-war reconstruction but also during the all period of the further post-war Soviet history: "When… I detailed how the industrial ministries consistently refused to allocate funds to clean up the discharges coming from their factories, this was not necessarily the result of indifference or ill will, but a logical response to the demands of the Stalinist planning system… The point is, however, that the way the system functioned, with its tendency toward self-negating growth, resources, in particular means of production, were always in short supply and would always be in short supply. The calculus that influenced investment decisions regarding urban hygiene in the late 1940s was no different from the calculus that discouraged industrial managers from installing ventilation systems and safety guards on machinery or from mechanizing backbreaking labor-intensive operations, whether it was in 1948 or 1991" [1, 352].

Explaining why the heavy industry constantly enjoyed a priority of the Soviet leadership, the author reveals the root cause of significant shortcomings in functioning of the Soviet economy created by Stalin. The author named it "waste or self-negating growth" when supreme leadership didn't care about waste of materials, work force, work time and thus labor productivity to achieve certain targets for the country's industrialization. As a result the Soviet industry gave what the author termes as "the deformed product" [1, 350]. Answering the question how does this analysis help us better to understand the problems of Soviet public health the author notes that the Soviet Union under Stalin neglected its urban infrastructure in the larger context of a problem the Soviet Union never solved: the balance between production and consumption [1, 352]. In other words extensive "waste economy" required more raw materials, fork force, industrial enterprises and finally more

investment which distracted funds from other sectors of economy and, of course, from the public health: “The waste of inputs was of such a scale that it required an overblown heavy industry sector just to keep the economy standing in place” [1, 349]. The Soviet industry required a constant funding priority not only because it was important in itself, but because it was costly in its functioning.

Having come to this conclusion on the causes of underfunding of the Soviet public health, the author shows how the Soviet leadership nevertheless was able to achieve stunning results in reducing the mortality of its population even comparing with industrialized Western countries. The Soviet leadership solved the problem of declining the mortality in the early postwar years not through large-scale investment in the health infrastructure but through components of a preventive medicine – epidemiological control and medical interventions (use of antibiotics, rapid diagnosis and hospitalization, immunization etc.) [1, 341].

Also the author gives the answers why did the Stalinist regime pursued namely that approach of financing of the health care on leftovers attributing the lack of investment to Stalin’s indifference to the welfare and well-being of ordinary people.

So what is the book’s value for the historian of the Soviet healthcare? Firstly this is its historiographical importance. Thanks to this book I was able to broaden my understanding of the Western historiography of the Soviet healthcare, the book of Filtzer contains references to the relatively new Western books dedicated to the above-mentioned subject. In addition it also based on a wide scale of documents from the central archives of Moscow which makes it possible for the Ukrainian researcher to read the documents access to which is not easy for several reasons.

Secondly, according to the author “the book contains a methodological warning for the future researchers shows the risks of engaging in demographic analyses without understanding the details and specifics of the conditions that produced these demographic results, especially at local level”.

Besides the book of Filtzer gives the ability by comparing data on the Kharkiv with other Soviet cities to supplement the overall picture of the sanitary and living

conditions of the post-war Kharkiv in those moments that are not reflected in available local sources.

With the help of this book personally I came to understanding at what angle I should consider empirical data and interim conclusions of my studies, how to work with Soviet archival documents. I recommend reading of this really interesting and rare book to all researchers of the Soviet social history.

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Ільїн В.Г.

Коли локальна історія набуває більш широкого змісту: рецензія на книгу Дональда Філтцера «Небезпеки міського життя в пізній сталінській Росії: здоров'я, гігієна і рівень життя, 1943-1953»

Харківський національний медичний університет, Україна

Резюме. Книга британського дослідника Дональда Філтцера є цікавим зразком того, як слід розглядати конкретну проблему, щоб дійти висновків, які не тільки розв’язують її, а й виходять за її межі, піднімаючи більш широкі питання і створюючи таким чином наступність в історичних дослідженнях різних рівнів – від локального до міжпредметного. Автор даної роботи, розглядаючи ключові фактори, які впливали на умови життя мешканців радянських міст, доходить парадоксального висновку, що за відставання життєвих умов в СРСР від Західної Європи, хронічного недофінансування зруйнованої міської інфраструктури радянський режим досяг значних успіхів в приборканні інфекційних хвороб і зниженні смертності. Але головний висновок автора полягає у з’ясуванні того, як характер сталінської моделі економіки вплинув на характер перерозподілу державних інвестицій саме на користь важкої промисловості, що призвело до хронічного недофінансування охорони здоров’я і міської інфраструктури. Автор доходить оригінальних висновків, які будуть цінні для всіх, хто цікавиться історію СРСР.

Ключові слова: пізня сталінська Росія, робітнича історія, водопостачання, міська санітарія, дитяча смертність, збиткове зростання.

Ильин В.Г.

Когда локальная история приобретает более широкое содержание: рецензия на книгу Дональда Фитцера «Опасности городской жизни в поздней сталинской росии: здоровье, гигиена и уровень жизни, 1943-1953»

Харьковский национальный медицинский университет, Украина

Резюме. Книга британского исследователя Дональда Фитцера является интересным примером того, как следует рассматривать конкретную проблему, чтобы прийти к выводам, которые не только развязывают её, но и выходят за её рамки, поднимая более широкие вопросы и создавая таким образом преемственность в исторических исследованиях разных уровней – от локального до межпредметного. Автор данной работы, рассматривая ключевые факторы, которые влияли на условия жизни жителей советских городов, приходит к парадоксальному выводу о том, что при отставании жизненных условий в СССР от Западной Европы, хроническом недофинансировании разрушенной городской инфраструктуры советский режим достиг значительных успехов в обуздании инфекционных болезней и снижении смертности. Но главный вывод автора заключается в выяснении того, как

характер сталинской модели экономики повлиял на характер перераспределения государственных инвестиций именно в пользу тяжёлой промышленности, что привело к хроническому недофинансированию здравоохранения и городской инфраструктуры. Автор приходит к оригинальным выводам, которые будут ценны для всех, кто интересуется историей СССР.

Ключевые слова: поздняя сталинская Россия, рабочая история, водоснабжение, городская санитария, детская смертность, затратный рост.

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