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****I would like cordially welcome the readers, authors and publishers of the new journal **“Medical Journal of Young Scientists”.**

Since the first years of its existence, the Tashkent Medical Academy has been training highly qualified medical personnel. Moreover, today this direction remains the main one. The content of the training has changed qualitatively. The world is changing rapidly today. In Uzbekistan, there is an urgent need for the formation of medicine – knowledge, leadership and innovation, which is based on the integration of both education, science and medicine.

Having completed fundamental professional training at TMA, the student becomes a highly qualified specialist. A wide profile of training, acquired practical skills allow him to constantly improve in the course of his work and master additional specialties.

The main purpose of the scientific journal is to study the intellectual potential of young people, analyze and systematize scientific achievements in the field of medicine. The journal will present both the results of experimental studies and publications on clinical topics in various fields: therapy, surgery, pediatrics, endocrinology, neurology, obstetrics, hygiene, social medicine and health management.

Current issues of modern medicine will be published in the materials. Tashkent Medical Academy opens up wide opportunities for everyone who crosses its threshold. The TMA is for those who believe in themselves and strive for success.

I wish all enrollees, students, postgraduates, professors and staff of TMA successful implementation of their goals, creative success in their studies and work, new achievements for the benefit of medicine.

**Rector of Tashkent Medical Academy,**

**Doctor of Medical Sciences A.K.Shadmanov**

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**NEW PEDAGOGICAL TECHNOLOGIES**

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# THE RELEVANCE OF THE INTRODUCTION OF DIGITAL MEDICINE SKILLS IN THE LEARNING PROCESS OF MEDICAL UNIVERSITY STUDENTS

**Khalmukhamedov B.T., PhD**

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With the rapid development of science and technology, the needs of people also in­crease. Yesterday's inventions, which seemed like a miracle, today have become common­place and are a means of facilitating everyday life. At the same time, the role of modern in­formation and communication technologies is important. The transformations taking place today in the medical field, aimed at improving the standard of living of the population, strengthening their health and ensuring high life expectancy, are paramount.

In accordance with the order of the Min­istry of Health on the commissioning of an au­tomated information system (AIS) for a single electronic registration and making an appoint­ment with a doctor via the Internet “Electronic Polyclinic” dated August 17, 2017, centralized databases have been created in many family clinics in Tashkent, a system of electronic out­patient charts and case histories. Through the official website of the Ministry of Health (reg.minzdrav.uz and ssv.uz), citizens can make an appointment with a doctor, get infor­mation about the doctor and the institution. Pa­tients can evaluate the quality of received med­ical services [4].

In accordance with the Decree of the President of the Republic of Uzbekistan dated June 20, 2017 No. PP-3071 “On measures to further develop the provision of specialized medical care to the population of the Republic of Uzbekistan in 2017-2021”, the Electronic Polyclinic system was launched. "Electronic Polyclinic" is one of the most important pro­jects developed and implemented by the Cen­ter for the Development of Information and Communication Technologies.

With the help of this system, the popula­tion can make an appointment with a doctor at a convenient time without leaving home, get information about the institution and doctors in their area, and also evaluate the quality of med­ical services received. The advantages of this system for polyclinics are automated data re­cording, the possibility of maintaining a single electronic outpatient medical record in family polyclinics. Also, this system has a number of features: the formation of information about the location of medical institutions and their mode of operation; introduction of the elec­tronic service "Make an appointment with a doctor"; scheduling work of doctors.

To date, according to the Ministry of Health of the Republic of Uzbekistan, 423 in­stitutions are connected to the "Electronic Pol­yclinic" information system, of which: 167 family polyclinics, 168 multidisciplinary poly­clinics, 19 regional (children's) multidiscipli­nary medical centers, 69 regional DPM and branches of centers. The number of patient data collected reached 8,412,211. The infor­mation system "Electronic Polyclinic" allows medical workers to increase work efficiency and transparency of information. As of Febru­ary 15, 2021, the number of system users ex­ceeded 10,000 people. The number of indica­tors listed above has been increasing over the years. However, there are a number of chal­lenges facing the improvement of the eHealth system today. In particular, some medical in­stitutions do not have complete computer equipment, high-quality Internet access, doc­tors do not have enough skills to use the sys­tem, etc. Necessary measures are being taken to eliminate these shortcomings and problems, and in the near future the system will be avail­able in in the form of a mobile application [5].

Given the above, for the effective opera­tion of e-health, a radical improvement in the level of training of medical personnel is neces­sary. An urgent task in the process of modern­izing the modern educational process in a med­ical university is the introduction of a system of active teaching methods based on Hi-Tech technologies into the educational process.

Already now, for the convenience of pa­tients and doctors, all documents are being converted into electronic form. The ability to make an appointment with doctors not only at the reception, but also through special termi­nals in clinics and on the Internet, of course, significantly saves the patient's time and effort. The means of information and communication technologies in the e-medicine system should ensure the timely and reliable exchange of in­formation necessary for the provision of e-medicine services.

The introduction of e-health into practice in the Republic of Uzbekistan is characterized by the reorientation of modern medical educa­tion at the university to a personal and compe­tence-based approach. It is a priority and pro­vides for the modernization of the education system through the introduction of training el­ements based on the formation of basic compe­tencies that allow graduates to independently acquire knowledge that is as close as possible to practical healthcare.

From this point of view, great emphasis is placed on the practical training of specialists in the field of e-health, since students who have completed a bachelor's degree, i.e. future fam­ily doctors who have received a diploma im­mediately begin practical work in primary health care. Today, given the development and implementation of e-health, medical students and the teaching staff of medical universities are concerned about the peculiarities of prepar­ing students at graduating departments. In this regard, medical universities need to actively develop and conduct training sessions to facil­itate the adaptation of students to the new rules for organizing the healthcare system. [3].

The use of electronic documents in the practice of medical personnel, in particular a doctor, especially in primary health care, is im­portant in improving the quality of medical care to the population. The introduction of electronic medical outpatient records and case histories in a test mode is currently used in sev­eral clinics and hospitals of the Republic of Uzbekistan.

Due to the use of a variety of replenisha­ble directories and templates, entering data on cases of patient care in an electronic medical record takes much less time than when manu­ally filling out outpatient cards and case histo­ries. In addition, with its implementation, the problem of transporting documents from one medical organization to another is eliminated, the degree of protection of patients' personal data is increased - this ensures a high-quality exchange of information necessary for the pro­vision of e-medicine services. [1].

Currently, students studying at the clini­cal bases of medical institutes are trained in the rules for maintaining medical records in paper form. We are faced with the task of full-scale introduction of electronic resources into the learning process of graduating students, which will allow you to quickly find existing and add new information about all cases of medical care provided to the patient, as well as auto­matically generate medical documents.

Based on modern telemedicine innova­tive computer technologies, to train 6th year students of the Faculty of Medicine in the fol­lowing skills: opening an electronic outpatient card and entering the patient's passport data; entering complaints and anamnesis, the results of an objective examination, diagnosis; ap­pointment in the electronic patient record of la­boratory and instrumental examinations for the patient; prescription of treatment for this pa­tient. To increase professional and educational motivation, early readiness of students for practical activities in primary care.

**Conclusions.** The introduction of the course "Electronic Polyclinic" into the process of teaching undergraduate students of the 6th year of the Faculty of Medicine will increase and strengthen the readiness of students for medical practice in primary health care. As the confidence in their preparedness for their work increases, so will the motivation for learning, as well as for the professional activities of stu­dents. Therefore, it is very important to de­velop and improve training courses on working with electronic resources, especially in medi­cal institutes of our republic.

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**CLINICAL MEDICINE**

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# THE ADVANCEMENT OF NONSPECIFIC PROPHYLAXIS AND THERAPY PSEUDOTUBERCULOSIS AND INTESTINAL YERSINIOSIS

**Ostonova Gulruh Sodiqovna**

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***Summary.*** *Recent years have witnessed the development and clinical implementation of the new approaches to prophylaxis and treatment of different nosological forms of diseases - combination of conventional therapy and immunocorrection. The review analyzes present-day state of nonspecific prophylaxis and treatment of pseudotuberculosis and intestinal yersiniosis. Information is presented on the effectiveness of immunomodulators, products of vital activity of plant cells and sea creatures, prebiotics, immunoglobuline complex (CIP) in prophylaxis and therapy of these diseases.*

***Key words:*** *pseudotuberculosis, intestinal yersiniosis, immunoglobulins, immunocorrection, prebiotics.*

**СОВЕРШЕНСТВОВАНИЕ НЕСПЕЦИФИЧЕСКОЙ ПРОФИЛАКТИКИ И ЛЕЧЕНИЯ ПСЕВДОТУБЕРКУЛЕЗА И КИШЕЧНОГО ИЕРСИНИОЗА**

**Остонова Гулрух Содиковна**

Бухарский государственный медицинский институт, Бухара, Узбекистан

***Резюме.*** *В последние годы разрабатываются и внедряются в клиническую практику новые подходы к профилактике и лече­нию различных нозологических форм заболеваний - сочетание базовой терапии с иммунокоррекцией. Обзор посвящен анализу современного состояния неспецифической профилактики и лечения псевдотуберкулеза и кишечного иерсиниоза. Приведены данные об эффективности иммуномодуляторов, продуктов жизнедеятельности растительных клеток и обитателей морей, пребиотиков, комплексного иммуноглобулинового препарата (КИП) при профилактике и лечении этих заболеваний.*

***Ключевые слова:*** *псевдотуберкулез, кишечный иерсиниоз, иммуноглобулины, иммунокоррекция, пребиотики.*

**PSEVDOTUBERKULYOZ VA ICHAK YERSINIOZINING NOSPESIFIK PROFILAKTIKASI VA DAVOLASHNI TAKOMILLASHTIRISH**

**Ostonova Gulruh Sodiqovna**

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***Xulosa.*** *So'nggi yillarda kasalliklarning turli nozologik shakllarini oldini olish va davolash bo'yicha yangi yondashuvlar ishlab chiqildi va klinik amaliyotga kiritildi - immunoterapiya bilan asosiy terapiya kombinatsiyasi. Ko'rib chiqish psevdotuberkulyoz va ichak yersiniozining nonspesifik profilaktikasi va davolashning hozirgi holatini tahlil qilishga bag'ishlangan. Ushbu kasalliklarning oldini olish va davolashda immunomodulyatorlar, o'simlik hujayralari va dengiz aholisi chiqindilari, prebiyotikalar va kompleks immunoglobulin preparati (CIP) samaradorligi to'g'risidagi ma'lumotlar keltirilgan.*

***Kalit so'zlar:*** *psevdotuberkulyoz, ichak yersiniozi, immunoglobulinlar, immunokoreksiya, prebiyotikalar.*Microorganisms belonging to the genus Yersinia of the family Enterobacteriaceae are the cause of serious diseases affecting animals and humans and characterized by various clin­ical manifestations.There is reason to suppose that diseases caused by the causative agents of pseudotuberculosis and yersiniosis are much more common than diagnosed. This often leads to the fact that the infection becomes general­ized with the involvement of various organs and systems in the pathological process, recurs and continues for several months.

It was revealed that the frequent chronic­ity of the process in pseudotuberculosis can be caused by disorders in the immune status, as well as the lack of adequate therapy that can normalize these disorders [1]. It has been shown that the causative agents of pseudotu­berculosis and intestinal yersiniosis not only induce apoptosis of macrophages and dendritic cells, but also suppress the induction of TNF-a, IL-12 and IL-10. In addition to the effect on the cells of innate immunity, Yersinia disrupt the formation of an adaptive immune response, changing the properties of T- and B-lympho­cytes (T- and B-Lf) [2]. The thermostable toxin of pseudotuberculosis bacteria suppresses the phagocytic activity of neutrophils and macro­phages, as well as the humoral immune re­sponse, reducing the number of antibody-pro­ducing cells [3]. A number of clinical strains of Yersinia have drug resistance, which leads to the generalization of the process against the background of a decrease in the body's re­sistance, making the traditional treatment of these infections ineffective.

All of the above indicates the need for the combined use of drugs and substances of various chemical nature for the treatment and prevention of pseudotuberculosis and yer­siniosis. New approaches to the prevention and treatment of various nosological forms of dis­eases - the combination of basic therapy with immunocorrection [4, 5], are being developed and introduced into wide clinical practice. One of the first Plotnikov K.P. [6] showed that the use of thymogen along with etiotropic therapy reduces the duration of clinical manifestations and relapses of pseudotuberculosis, which cor­relates with the normalization of the functional activity of Lf, immunoregulatory index, the number of T-activated Lf. The use of an im­munomodulator is especially effective in pa­tients with severe and moderate pseudotuber­culosis.

The results obtained by O.A. Burgasova et al. [7] in experiments on animals, testify to the protective effect of the Bestim immuno­modulator, which manifests itself in limiting the dissemination of Y. pseudotuberculosis into organs and tissues in 80-90% of mice, re­ducing the development time (by 6 days) in them of pathological process and prevention of death.

The use of the drug "Cycloferon" in the treatment of pseudotuberculosis and intestinal yersiniosis in children, in contrast to traditional antibacterial therapy, leads to a more rapid re­lief of local and systemic symptoms. The pos­itive effect of the drug on the anti-infectious resistance of the colon mucosa was expressed in the normalization of the microecology of its lumen and the elimination of pathogens and conditionally pathogenic microflora [8, 9].When used in complex therapy of recurrent forms of pseudotuberculosis, the drug Ronco­leukin, a recombinant human IL-2, has proven itself well. In patients who received this drug, the duration of the period of intoxication was significantly reduced, the rash, cardiopathy, etc. disappeared faster. Not a single patient who received Roncoleukin developed repeated relapses [10].

The maximum protective effect of an­other cytokine (recombinant IL-1v) in animal experiments was established. There was a de­crease in the number of dead mice by 30% compared to the control and by 1-4 orders of magnitude in the concentration of Yersinia in the internal organs of infected animals, which indicates its positive effect on the severity of experimental pseudotuberculosis [11]. The in­clusion of sodium nucleonate in the complex therapy of children with yersiniosis did not have a significant effect on the content of T- and B-lymphocytes, but significantly im­proved the phagocytic activity of blood neutro­phils, smoothing out the clinical manifesta­tions of the disease [12].

Extensive research is being carried out on the immunomodulatory effect of drugs of various chemical nature, including the waste products of plant cells and sea dwellers. Thus, a biopolymer of natural origin arabinogalactan (an intracellular polysaccharide of Dahurian and Siberian larch trees) increases the phago­cytic activity of macrophages against pseudo­tuberculosis microbes and stimulates antitelo­genesis [13].

It was also shown that glucans, glycopro­teins and peptides of natural origin (mytilan, coral, translam, ponasan, etc.) isolated from marine organisms and representatives of the Far Eastern flora (mussels, corals, algae, etc.) promote an increase in the functional activity of phagocytes, enhancing the absorption and digestion of Y. pseudotuberculosis [14].

Currently, research in this direction is ongoing. So, scientists of the Pacific Oceano­logical Institute, together with colleagues from the Research Institute of Epidemiology and Microbiology of Vladivostok, showed that the drug "Pentakan" (extract from Far Eastern galaturias) had immunomodulatory activity, stimulating the functional activity of macro­phages in pseudotuberculosis infection in mice [15].

Much attention of modern researchers is paid to the study of the possibility of including preparations of normal intestinal microflora in the treatment regimen and non-specific prophylaxis of many infectious diseases. It has been proven that the constant presence of resi­dent microorganisms adhered to its wall in the intestine prevents the multiplication of patho­gens, creates an environment unfavorable for their development due to the formation of an­timicrobial compounds, and also stimulates the restoration of immune cells in the submucosal layer [16].

The most important aspects of the inter­action of probiotic strains with the intestinal microflora and the body are the formation of antibacterial substances, competition for nutri­ents and the site of adhesion, changes in micro­bial metabolism (increase or decrease in enzy­matic activity), stimulation of the immune sys­tem, which indicates the prospects for using probiotics for non-specific disease preven­tion.The possibility of preventing the develop­ment of pseudotuberculosis and intestinal yer­siniosis in conventional white mice with the prebiotic "Stimbifid" and low-molecular exo­metabolites of the supernatant of native cul­tures of probiotic bifidobacteria and lactoba­cilli was studied. It was found that these drugs arrest the development of the infectious pro­cess and its generalization both in the course of prophylactic and therapeutic courses [17-19].

There is an opinion that when choosing the means of "starting" therapy in the initial pe­riod of the disease in mild and moderate forms of infectious diseases (including intestinal), preference should be given not to antibiotic and chemotherapy, but to drugs with direct or indirect etiopathogenetic impact on pathogens [20]. The widely used immunoglobulin (Ig) drugs for passive immunotherapy are such drugs. Increasing the effectiveness of the treat­ment of infections with the use of antibodies consists in the immediate implementation of their direct effect not only on the microorgan­ism (opsonization, phagocytosis and elimina­tion), but also on the immune system of the macroorganism. By binding to the correspond­ing antigens, antibodies neutralize them, con­vert them into an insoluble form, as a result of which the mechanisms of phagocytosis, com­plement-dependent lysis and subsequent elim­ination of antigens from the body are triggered.

A complex immunoglobulin preparation (CIP) developed by employees of the Moscow Research Institute of Epidemiology and Micro­biology. G.N. Gabrichevsky, contains a high concentration of antibodies to gram-negative enteropathogenic bacteria of the intestinal group (Shigella, Salmonella, Escherichia, etc.). Immunobiological properties of instru­mentation are due to the content of immuno­globulins of three classes IgA (25%), IgM (25%) and IgG (50%).IgM, activating comple­ment and causing bacterial lysis, has a bacteri­cidal effect on pathogenic microorganisms, IgA makes it difficult for them to attach to the epithelium of the mucous membrane and en­sures rapid removal from the intestine, IgG neutralizes microbial toxins and viruses, medi­ates the "adhesion" of bacteria to macrophages with their subsequent phagocytosis. Therefore, the instrumentation, which is very important, can be used without antibacterial therapy [21].

In addition to removing pathogenic and opportunistic microorganisms from the body, CIP promotes the growth of normal intestinal microflora (bifidobacteria, lactobacilli, entero­cocci and non-pathogenic Escherichia coli), in­creases the production of secretory IgA and normalizes altered indicators of systemic im­munity.

The drug is recommended for the pre­vention of infectious diseases in people with acquired immunodeficiency, as well as for im­munocorrective therapy in people with reduced activity of humoral immunity factors (prema­ture babies; infants who are artificially fed; people suffering from chronic diseases of the gastrointestinal tract, elderly people, etc.) [22].Employees of the Rostov-on-Don Anti-Plague Institute [23-24] studied the influence of instrumentation on the development and outcome of experimental pseudotuberculosis and intestinal yersiniosis and the formation of a cellular and humoral immune response to the causative agents of these diseases.

It was revealed that this drug, acting on the initial stages of the initiation of the infec­tious process upon oral intake of pathogens into the body, prevents their adhesion to the ep­ithelial cells of the intestinal mucosa of ani­mals, colonization, further invasion, and, con­sequently, the dissemination of pathogens in the parenchymal organs, preventing the devel­opment of pathological processes and the death of mice.

It was found that the use of the drug en­hances the absorptive, digesting ability of phagocytes, the expression of receptors on their membranes, the bactericidal activity of these cells, providing complete phagocytosis of Yersinia. In addition, KIP has a positive ef­fect on antibodies and the process of utilization of circulating immune complexes.

The results obtained indicate that the use of instrumentation is promising for the preven­tion and treatment (including in conjunction with etiotropic therapy) of experimental pseudotuberculosis and yersiniosis.

Thus, the results of experimental and clinical studies indicate that the combined use of drugs of various chemical nature, as well as prebiotics, opens up new approaches to the prevention and treatment of pseudotuberculo­sis and intestinal yersiniosis.

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# THE RELATIONSHIP BETWEEN CORONARY CALCIUM AND THE LEVEL OF CORONARY ARTERY STENOSIS ACCORDING TO CORONARY ANGIOGRAPHY

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***Abstract.*** *Coronary heart disease is the leading cause of death worldwide, particularly in Uzbekistan. Early diagnosis of coronary heart disease is one of the primary tasks of clinical medicine. The coronary calcium index is considered one of the strongest tools for predicting the risk of coronary heart disease. Due to the ease of implementation, cost-effectiveness and practically no contraindications, the determination of the calcium index has become widespread, especially during screening in patients with suspected coronary heart disease. The CC index correlates with the level of CA stenosis according to CAG data. This method is included in the American and European recommendations for the diagnosis of coronary heart disease, it has proven its high prognostic value, especially with CI = 0, and can serve as a starting point in changes in recommendations for prescribing statins to asymptomatic patients.*

***Key words:*** *Agatston index, MSCT, coronary calcium, cardiovascular diseases, coronary angiography, coronary arteries.*

**KORONAR KALSIY VA KORONAR ANGIOGRAFIYA BO'YICHA KORONAR ARTERIYALAR STENOZI DARAJASI O'RTASIDAGI BOG'LIQLIK**

***Annotatsiya.*** *Yurak ishemik kasalligi butun dunyoda, shu jumladan, O'zbekistonda o'limning etakchi sababidir. YuIK ning erta diagnostikasi klinik tibbiyotning asosiy vazifalaridan biridir. Koronar kalsiy ko'rsatkichi koronar yurak kasalligi xavfini prognozlashning kuchli vositalaridan biri hisoblanadi. Tufayli amalga oshirish, iqtisodiy samaradorligi va kontraendıkasyonlar deyarli yo'qligi soddaligi uchun, kaltsiy indeksi aniqlash, ayniqsa, koronar arteriya kasalligi shubha bilan bemorlarning skrining, keng tarqalgan edi. KK ko'rsatkichi ka ga ko'ra ka stenozining darajasi bilan bog'liq. Ushbu usul AQSh va Evropa koronar arter kasalligi diagnostikasi bo'yicha tavsiyalarga kiritilgan bo'lib, u yuqori prognostik qiymatini, ayniqsa KI=0da isbotladi va asemptomatik bemorlarga statinlarni tayinlash bo'yicha tavsiyalarni o'zgartirish uchun boshlang'ich nuqta sifatida xizmat qilishi mumkin.*

***Kalit so'zlar:*** *Agatston indeksi, MSCT, koronar kaltsiy, yurak-qon tomir kasalliklari, koronar angiografiya, koronar arteriyalar.*

**ВЗАИМОСВЯЗЬ МЕЖДУ КОРОНАРНЫМ КАЛЬЦИЕМ И УРОВНЕМ СТЕНОЗА КОРОНАРНЫХ АРТЕРИЙ ПО ДАННЫМ КОРОНАРОАНГИОГРАФИИ**

***Аннотация.*** *Ишемическая болезнь сердца (ИБС) является ведущей причиной смертности во всем мире, в том числе и в Узбекистане. Ранняя диагностика ИБС представляет одну из первостепенных задач клинической медицины. Показатель коронарного кальция (КК) считается одним из сильных инструментов прогнозирования риска развития коронарной болезни сердца. В связи с простотой выполнения, экономичностью и практически отсутствием противопоказаний, определение кальциевого индекса получило широкое распространение, особенно, при скрининге у пациентов с подозрением на наличие ИБС. Показатель КК коррелирует с уровнем стеноза КА по данным КАГ. Данный метод включен в американские и европейские рекомендации по диагностике ИБС, он доказал свою высокую прогностическую ценность, особенно при КИ=0, и может служить отправной точкой в изменениях рекомендаций по назначению статинов бессимптомным пациентам.*

***Ключевые слова:*** *индекс Агатстона, МСКТ, коронарный кальций, сердечно-сосудистые заболевания, коронарография, коронарные артерии.*

**Relevance.** Cardiovascular diseases (CVD) is the leading cause of mortality in the world and causes over 17.5 million deaths per year. Among CVD in the structure of mortality of the population, the first place is occupied by coronary heart disease (CHD). In Uzbekistan, CHD is also the main cause of death among the adult population. The analysis shows that 53% of deaths among the population of the Republic of Uzbekistan aged 30-70 years are associated with CVD. They are diagnosed in about 4 mil­lion people, which is 12% of the total popula­tion.

CHD is an acute or chronic dysfunction resulting from an absolute or relative decrease in the supply of arterial blood to the myocar­dium. The share of CHD among all causes of mortality of the population is more than 30%. The main etiological factor of CHD is athero­sclerosis of the coronary arteries (CA), in 95% of patients with CHD.

Calcification of the CA is a characteristic sign of coronary atherosclerosis, which is often detected by computed tomography (CT) of the chest organs. The standardized method for as­sessing coronary calcification is the calcium index (CI) according to the Agatston method. A semi-quantitative assessment of coronary calcium (CC) with electrocardiographic syn­chronization is considered a strong prognostic factor for the occurrence of coronary events in asymptomatic patients. Zero CI can serve as the strongest negative risk factor for the devel­opment of cardiovascular events for 10-15 years. According to international recommen­dations, CI should be used in intermediate-risk and low-risk patients with a cardiovascular family history, as well as in diabetics over 40 years of age.

**The aim of the study:** to compare the Agaston index (CC) and the level of CA steno­sis according to coronary angiography (CAG); to increase the early detection of coronary ar­tery disease by determining the indicators of CC.

**Material and methods of research.** The study was conducted in the Tashkent Medical Academy and Republican Specialized Scien­tific and Practical Center of Cardiology. The study involved 54 people (25 women, 29 men) aged 45-65 years, with complaints of pain and discomfort behind the sternum. All patients un­derwent multispiral computed tomography (MSCT) with the determination of CC, CAG. The CC assessment was carried out using the Philips Ingenuity Core 64 MSCT.

**The results of the study.** The Agaston index is a semi-automatic method for calculat­ing the degree of calcification of CA using low-dose non-amplified CT, which is routinely used in CT examination of the heart. Due to the extended study, this method allows us to iden­tify the early risk of CHD in patients with an Agaston index of more than >160. Although this method does not allow to evaluate soft-tis­sue non-calcified plaques, it still correlates well with the data obtained by CT angiography using contrast agents [3].

**Calculation method.** The calculation is performed by multiplying the weighted density (density factor) for a zone with high radiation attenuation (plaques with high values in Hounsfield units [HU]) by the area of the cal­cified plaque.

Density factor:

• 130-199 HU: 1

• 200-299 HU: 2

• 300-399 HU: 3

• 400+ HU: 4

For example, if a calcified plaque has a maximum attenuation of 400 HU and occupies an area of 8 mm2, its CC will be equal to 32. The index of each zone/plaque is summed up giving a total index [2].

Gradation of coronary vascular lesions based on the total coronary calcium index:

• there are no signs of damage: the coro­nary calcium index is 0

• minimum maintenance: coronary cal­cium index from 1 to 10

• minor lesion: coronary calcium index from 11 to 100

• moderate lesion: coronary calcium in­dex from 101 to 400

• severe lesion: coronary calcium index >400

Quantitative assessment of the Agatston index

• Agatston index 0

o Ca - Calcium score is not determined

o The risk of developing CHD is mini­mal

o Applicable to men and women over 40 years of age

o Recommendations - General preven­tive measures

• Agatston index 1-10

o Ca score - Minimum calcification

o Risk of coronary heart disease - The development of coronary heart disease is un­likely

o Indications for treatment based on gen­der and age - Applicable to men and women over 40 years of age.

o Recommendations - General preven­tive measures

• Agatston index 11-100

o Ca score - Minor calcification

o Risk of coronary heart disease - Mini­mal stenosis is possible

o Indications for treatment taking into account gender and age - The highest clinical value if the indicator is >75 percentiles

o Recommendations - Exclusion of risk factors

• Agatston index 101-400

o Ca score - Moderate calcification

o Risk of coronary heart disease - Hemo­dynamically insignificant stenoses are likely

o Indications for treatment taking into account gender and age - The highest clinical value if the indicator is >75 percentiles

o Recommendations - Exclusion of risk factors. Cardiological follow-up examination

• Agatston index > 400

o Assessment of Ca - Pronounced calci­fication

o Risk of coronary heart disease - High probability of hemodynamically significant stenoses

o Indications for treatment taking into account gender and age - The highest clinical value if the indicator is >75 percentiles

o Recommendations - Exclusion of risk factors. Stress ECG, Stress Echo. Coronarog­raphy if necessary.

o Comparison of the coronary calcium index and the level of stenosis according to CAG:

• coronary calcium index 27-88 corre­sponds to >20% of stenosis according to CAG

• coronary calcium index 89-127 corre­sponds to >30% of stenosis according to CAG

• coronary calcium index corresponds to >40% of stenosis according to CAG

• coronary calcium index corresponds to >50% of stenosis according to CAG

• coronary calcium index >371 corre­sponds to >70% of stenosis according to CAG [6]

Grading of the lesion of the spacecraft according to the Agaston index: 0 – no signs of lesion (group 1); 1-10 – minimal lesions (group 2); 11-100 – minor lesions (group 3); 101-400 – moderate lesion (group 4); more than 400 – severe lesion (group 5). Of the studied patients, 3 (5.6%) were included in group 2, CAG was not performed; 21 (38.9%) were included in group 3, CAH revealed hemodynamically in­significant CA stenosis; 27 (50%) were in­cluded in group 4, with CAG in 19 patients - 50-60% CA stenosis and 8 – more 70% CA ste­nosis; 3 (5.6%) patients were included in group 5, with CA more than 70% CA stenosis. 11 pa­tients underwent angioplasty with stent place­ment.

**Conclusion:** CI is considered one of the strongest tools for predicting the risk of CHD. Due to the ease of implementation, cost-effectiveness and practically no contraindica­tions, the definition of CI has become wide­spread, especially during screening in patients with suspected CHD [5]. For several decades, a large amount of evidence-based information has accumulated not only about the diagnostic, but also the prognostic value of CI. This method currently confidently occupies its niche among the methods for the early preclin­ical diagnosis of CHD. It should be noted that the method is included in the American and European recommendations for the diagnosis of CHD, it has proven its high prognostic value, especially with CI = 0, and can serve as a starting point in changes in recommendations for prescribing statins to asymptomatic pa­tients [4]. The calculation of CI by CT is not inferior in accuracy to the standard Agatston method with ECG synchronization both in ab­solute values and when assigning patients to a particular risk group according to CI 0.1-100, 101-400, 401-1000 and >1000. The combina­tion of CT (including low-dose) with the cal­culation of CI can significantly enhance the significance and effectiveness of screening programs, not only from a diagnostic point of view, but also from an economic point of view. Simultaneous early detection of such socially significant diseases as lung cancer and CHD is a promising stage in the further development of modern radiology [1,2].

The CC score is an independent marker of risk for cardiac events, cardiac mortality, and all-cause mortality [8]. In addition, it pro­vides additional prognostic information to other cardiovascular risk markers. The well-es­tablished indications for the use of the CC score include stratification of global cardiovas­cular risk for asymptomatic patients: interme­diate risk based on the Framingham risk score (class I); low risk based on a family history of early CHD (class IIa); and low-risk patients with diabetes (class IIa) [9,10]. In symptomatic patients, the pre-test probability should always be given weight in the interpretation of the CC score as a filter or tool to indicate the best method to facilitate the diagnosis. Therefore, the use of the CC score alone is limited in symptomatic patients. In patients with diabe­tes, the CC score helps identify the individuals most at risk, who could benefit from screening for silent ischemia and from more aggressive clinical treatment.

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# STUDY OF PHYSICAL ACTIVITY WITH EXERCISE PULSE IN PATIENTS WITH ISCHEMIC HEART DISEASE

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***Annotation.*** *Ischemic heart disease (IHD) is one of the leading cardiovascular diseases worldwide, and hypodynamics is one of the main etiological factors of this disease. The study examined and compared patients' "exercise pulse" at the beginning of the study and after 6 months. An increase in tolerance to physical activity was noted in patients during individual optimal-dose walking exercises, which was manifested by a 2.6-fold increase in the time to reach the allowable pulse rate during walking exercises.*

***Key words:*** *ischemic heart disease, exercise pulse, hypodinamy,**physical activity, veloergometry, angina pectoris*

**ЮРАК ИШЕМИК КАСАЛЛИГИ БИЛАН ОҒРИГАН БЕМОРЛАРДА МАШҚ ПУЛЬСИ ЁРДАМИДА ЖИСМОНИЙ ФАОЛЛИКНИ ЎРГАНИШ**

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***Аннотация.*** *Юрак ишемик касаллиги (ЮИК) – бутун дунё бўйича асосий юрак қон-томир касалликларидан бири хисобланиб, гиподинамия ушбу касалликнинг асосий этиологик факторларидан бири саналади. Тадқиқотда беморларнинг “Машқ пульси” белгилаб олиниб жисмоний юклама пайтида ушбу кўрсаткичига қанча вақтда етиб келиниши тадқиқот аввалида ва 6 ойдан сўнг текшириб, солиштириб кўрилди. Индивидуал оптимал дозаланган юриш машқлари ўтказилганда беморларда жисмоний юкламага толерантлик ортиши қайд этилиб, бу юриш машқлари давомида рухсат эилган пульс кўрсаткичига етиш вақти 2,6 бароварга ортишида намоён бўлди.*

***Калит сўзлар:*** *юрак ишемик касаллиги, машқ пульси, гиподинамия, жисмоний фаоллик, велоэргометрия, зўриқиш стенокардияси*

**ИЗУЧЕНИЕ ФИЗИЧЕСКОЙ АКТИВНОСТИ С ТРЕНИРОВИЧНЫМ ПУЛЬСОМ У БОЛЬНЫХ ИШЕМИЧЕСКОЙ БОЛЕЗНЬЮ СЕРДЦА**

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***Аннотация.*** *Ишемическая болезнь сердца (ИБС) является одним из ведущих сердечно-сосудистых заболеваний во всем мире, а гиподинамика является одним из основных этиологических факторов этого заболевания. В ходе исследования изучался и сравнивался «тренировочний пульс» пациентов в начале исследования и через 6 месяцев. У пациентов отмечалось повышение толерантности к физической нагрузке при индивидуальной оптимально дозированной ходьбе, что проявлялось увеличением в 2,6 раза времени достижения допустимой частоты пульса при ходьбе.*

***Ключевые слова:*** *ишемическая болезнь сердца, тренировочний пульс, гиподинамика, физическая нагрузка, велоэргометрия, стенокардия.*

**Actually of the study.** According to the definition of the World Health Organization, physical activity is any type of movement that occurs with the help of muscle power, accom­panied by energy expenditure, and this move­ment is manifested in the form of work and lei­sure, as well as daily physical activity. [5]

Aerobic exercise increases myocardial perfusion in people with risk factors for cardi­ovascular disease, an increase in the inner di­ameter of the large coronary arteries, improve­ment of microcirculation and endothelial func­tion, modulation of autonomic autonomic bal­ance, changes in the myocardial ischemic zone (short-term transient ischemia of the myocar­dium is observed during exercise, the regular continuation of this process in turn affects the increase in myocardial tolerance in long-term ischemic cases that may occur later), resulting in a reduced risk of developing myocardial in­jury and fatal ventricular tachyarrhythmias. [1]

Regular physical activity 150 minutes per week decreases the risk of pain with cardi­ovascular disease 40%, stroke 27%, type 2 di­abetes 58%, Alzheimer's 40%, colorectal can­cer 60%, lung cancer 20-24%, breast cancer Reduce by 50%, Concentration prevents de­pression and obesity, promotes a healthy life­style, has been proven to maintain an optimal level of professional work ability. [4]

Regular aerobic exercise has been proven to reduce the risk of death from the car­diovascular system by 30% per year, the over­all risk of death by 20%, the demand for hos­pitalization by 60%, and the risk of recurrent myocardial infarction by 17% in cardiology re­habilitation. At the same time, a 10% increase in physical performance reduces mortality by 8-20%. Age level and individual indicators of the organism are considered in the increase of physical activity. It is recommended to limit the time allotted for sitting or lying down dur­ing the day. [3]

Hypodynamics or lack of physical activ­ity is one of the manageable risk factors for cardiovascular disease. Hypodynamics leads to the hardening of the heart and blood vessels and the accumulation of excess body weight. Insignificant physical activity in such people also speeds up the heartbeat and raises blood pressure. It is known that IHD is 4-5 times more common in men aged 40-50 working in the office compared to heavy physical work. [7]

**The purpose of the study.** To study the level of physical activity using an exercise pulse in patients with ischemic heart disease and to determine the optimal dosed walking duration for each patient.

**Research materials and research methods.** The study was conducted from 2019 to 2021 in the 1st cardiology department of the multidisciplinary clinic of the Tashkent Medi­cal Academy. Patients diagnosed with IHD, stable tension angina FC II-III, being treated in the cardiology department, were selected for the study. Clinical signs of patients diagnosed with IHD, EKG (electrocardiography) infor­mation, based on the results of VEM (veloer­gometry) tests. Examination of compartmental fibrillation, AV block II-III degree, sympto­matic arterial hypertension, fever and patients with a history of acute infectious diseases, post-infarction cardiosclerosis, acute cerebro­vascular accident, diabetes mellitus, cardiac decompensation, and complex arrhythmias were not included.

The patients in the study were divided into 2 groups. Group 1 patients (main group) performed individually dosed walking exer­cises in combination with IHC standard ther­apy. Group 2 patients received only standard pharmacotherapy. When analyzing the clinical characteristics of the patients in the study, the average age of patients in group 1 was 56.3 ± 6.5, In group 2, it was 55.8 ± 5.3. In the first group, 20.9% of patients with stable tension angina belonged to functional class II, and 79.1% of patients to FC III. In turn, 19.9% of patients in group 2 had stable tension angina FC II and 80.1% had functional class III.

88.7% of the patients examined had hypertension with IHD. Of these, 25 (58.1%) of patients with AG (arterial hypertension) grade 1 belong to group 1, 20 (62.5%) to group 2; 9 (37.1%) of patients with AG grade 2 be­long to group 1, 8 (25.0%) to group 2; Of the 3rd degree AG patients, 5 (4.8%) belonged to group 1 and 4 (12.5%) to group 2.

When analyzed for risk factors for IHD, overweight was 18 (40%) in group 1 patients and 11 (33.4%) in group 2 patients. Obesity is 18 (40%) in group 1 and 12 (36.3%) in group 2. Of the patients examined, 37 (82.2%) were from group 1 and 29 (87.8%) were diagnosed with arterial hypertension.

Anthropometric measurements, clinical and laboratory examinations, ECG, VEM test, SCORE, SF 36 surveys were conducted in all patients. The threshold pulse rate was deter­mined using the "exercise pulse" formula. Based on the results of the first bicycle ergom­etric test, Nikolaev L.F., and Aronov D.M. The required walking rhythm for each patient is calculated using the formula:

Х = 0.042 х М + 0.15 х HR + 65.5

Х – walking pace (number of steps / min),

М – limiting power of loading (kgm / min),

HR – The number of high-load heart rate in the VEM test.

Patients were given physical activity on a flat road, walking at medium speed for 6 months, 3 times a week for 20-60 minutes. The "exercise load" is 50-60% of the patient's indi­vidual threshold load.

During physical activity and physical ac­tivity, O2 consumption in the body increases in proportion to their intensity. But after reaching a certain limit, the increase in physical load does not correspond to the consumption of O2. This the limit is called the maximum oxygen consumption. Maximum oxygen consumption (V O2max, l / min) is one of the most important physiological parameters for O2 of the cardio­vascular and respiratory systems, indicates the limiting capacity of the organism to meet the growing demand. This figure is reduced in the elderly, people leading a sedentary lifestyle, and patients with cardiovascular disease.

During the loading period, which con­sumes 40-75% of the maximum oxygen con­sumption, metabolic processes in the body im­prove. There is a direct correlation between the maximum oxygen consumption and the num­ber of heartbeats, which allows to determine the maximum number of heartbeats during ex­ercise on a standard basis.

Standards of HRC indicators of demand for O2 depending on age and sex during exer­cise. (According to R. Shepard, 2002)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| O2 consumption % | Age | | | |
| 40-49 | | 50-59 | |
| male | female | male | female |
| Number of HR per minute | | | |
| 40 | 115 | 117 | 111 | 113 |
| 60 | 136 | 138 | 131 | 134 |
| 75 | 152 | 154 | 145 | 145 |
| 100 | 178 | 179 | 170 | 171 |

The formula "exercise pulse" was devel­oped on the basis of the above law, using which the above figure was determined.

Exercise pulse = (220 - patient's age - pa­tient's 1 minute of rest at rest) x 0.6 + patient's 1 minute of rest at rest.

For example: the patient is 50 years old. The patient's 1-minute heart rate at rest was 70. In this case, the exercise pulse of this patient is 130.

(220-50-70) х 0,6 + 70 = 130

At the beginning of the study and after 6 months, patients were examined and compared to determine the "exercise pulse" and how long it takes to reach this level during exercise.

SCORE (Systematic COronary Risk Evaluation) scale to determine the overall risk of cardiovascular disease, SF 36 (The Short Form-36) - Used as a nonspecific question­naire to assess the quality of life of patients with chronic diseases.

**Results of scientific research:** The du­ration of the training was based on the results of veloergometry examination of patients at the time of the initial examination Nikolaev L.F. and Aronov D.M. The required walking rhythm was calculated for each patient using the formula. Using this formula, the patient's walking speed was determined by the number of steps per minute.

Patients who were able to perform up to 50 W load (conditionally IHD, stable voltage angina FC III) during the initial VEM test dur­ing training for 20-40 minutes, and patients who were able to perform up to 75 W load (conditionally YuIK, stable voltage angina FC II) 40-60 conducted dynamic walking exer­cises for minutes.

Preliminary indicators of patients' toler­ance to physical activity were assessed using veloergometry. In the main group, tolerance to physical activity was found to be low in 51.1% (22 people) and moderate in 48.9% (21 peo­ple). In the control group, tolerance to physical activity was found to be low in 51.4% (19 peo­ple) and moderate in 48.6% (18 people).

When the results were analyzed on the basis of gender, in the first study in both groups it was found that the indicators of tolerance to physical activity are higher in men than in women. Among men, 56.5% and 52.9% of pa­tients in the main and control groups had mod­erate tolerance to physical activity, respec­tively, and in women, 60% and 55% of patients in the main and control groups had low toler­ance (50 W), respectively. .

The following results were obtained when examining the time of patients to reach the "exercise pulse":

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | The main group  (n=43) | | Control group  (n=37) | |
|  | Даволашдан олдин | 6 ойдан  сўнг | Даволашдан олдин | 6 ойдан  сўнг |
| Time to reach the exercise pulse (in minutes) | 7,05±3,41 | 18,35±4,28  \*(р<0,05) | 7,24±4,19 | 9,35±5,51  \*(р>0,05) |

The main group of patients initially reached the allowable pulse rate during walk­ing exercises at 7.05 ± 3.41 minutes, while af­ter 6 months of intensive walking exercises this time increased by 2.6 times and amounted to 18.35 ± 4.28 minutes. Patients in the control group initially reached the allowable pulse rate during walking at 7.24 ± 4.19 minutes, and af­ter 6 months this time increased by 1.2 times to 9.35 ± 5.51 minutes. Although a positive trend was observed in all patients, the results were reliable only in the main group of patients who performed walking exercises (р<0,05).

When analyzing the body mass index of the patients, initially overweight (BWI 25.0-29.9) was detected in 35 of the examiners (43.8%). This figure was 20 (46.5%) among patients in the main group and 15 (40.5%) among patients in the control group. 29 pa­tients (36.3%) in the study were obese (body mass index 30.0 and above), which is 15 (34.5%) in the main group and 14 (37.8%) in the control group. When patients were re-ana­lyzed for height and weight after 6 months, af­ter 6 months of dynamic exercise 3 times a week for 20-60 minutes, the following was found.

After 6 months of physical activity, obe­sity in the main group of patients decreased by 27.9% to 12. With 3 patients overweight from the obesity group, 5 overweight patients re­turned to normal body weight at baseline. After 6 months, overweight was present in 18 (41.8%) of the examiners. An increase in obe­sity was observed in patients receiving only standard pharmacotherapy for 6 months. After 6 months, obesity was detected in 40.5% (15 people) of patients in the control group. Over­weight was also observed in 15 patients (40.5%).

When evaluating on the SCORE scale, the risk of death from cardiovascular compli­cations in the next 10 years in the primary and control group patients was 4.3 ± 1.9% and 4.1 ± 2.1%, respectively. When the results were analyzed after 6 months, a positive trend was observed in both groups. 4.1 ± 2.05% in the main group and 4.0 ± 1.85% in the control group. Although a positive trend was observed, the results after 6 months were not reliable in both groups (p> 0.05).

Significant differences were observed after treatment in the main group of patients who regularly exercised on the scale of physi­cal limitation (PL - physical limitation). In the main group, the PL index was 44.6 ± 3.9% be­fore treatment and 62.3 ± 6.0% after 6 months, respectively (r <0.05). In the control group, be­fore treatment, the rate was 43.5 ± 4.1%, and at 6 months, the rate was 48.7 ± 4.9% (r <0.05). A positive trend was observed in all patients on the attack stability scale AS (Angina stability), attack frequency scale AF (Angina frequency), treatment satisfaction scale TS (Treatment sat­isfaction), but the results were not reliable (p> 0.05).

**Conclusion:** Increased tolerance to physical activity was observed in patients with IHD, stable stenocardy II and III functional class, when combined with standard pharma­cotherapy for 6 months, 3 times a week for 20-60 minutes with individual optimal dose walk­ing exercises. time to reach the given pulse rate increased by 2.6 times. Stabilization of hemo­dynamic parameters of patients and a positive change in the BWI index were more noted in patients when standard pharmacotherapy was performed in combination with individual op­timally dosed walking exercises.

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# MORPHOLOGICAL INDICATORS OF DIFFERENT TYPES OF CHRONIC POLYPOSIS RHINOSINUSITIS

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*Chronic polypous rhinosinusitis is one of the urgent problems in rhinology, as it is a frequent consequence of a chronic long-term inflammatory process of the mucous membrane of the nasal cavity and paranasal sinuses. The study of morphological parameters of different types of chronic polypous rhinosinusitis will provide an opportunity to identify various forms of chronic polypous rhinosinusitis, its differentiation, selection of the correct treatment, and determination of exact indications for surgical removal of polyps, prognosis and prevention of relapse after polysinusotomy.*

***Key words:*** *polyp, rhinosinusitis, paranasal sinuses, polyposis, nasal mucosa, epithelium, polysinusotomy, myxomatous changes.*

The study aimed to investigate the histo­logical structures of different types of chronic polyposis rhinosinusitis.

**Material and methods**

Based on the TMA multidisciplinary clinic in the departments of otorhinolaryngol­ogy and maxillofacial surgery, a morphologi­cal study of the removed materials from the na­sal mucosa and paranasal sinuses was carried out. The patients were divided into two groups; the first group is patients with polypous rhi­nosinusitis, the second - with chronic rhinosi­nusitis.

For histological examination, the prepa­ration of materials was carried out on the host processor"Thermo scientific STP 120", Histo­star, Microm HM 325; the obtained material was carried out in stages as follows: registra­tion of the material, cutting, macro-descrip­tion, labeling of the cassettes, distribution of the material among the cassettes, primary diag­nosis, obtaining a preliminary diagnosis. Next stage was the processing of the material, mark­ing the glasses, obtaining the drug and evaluat­ing the results. Each prepared micro prepara­tion was photographed for further use in the re­search work.

**Research results:** During morphologi­cal studies in the first group, 80 patients had different clinical and morphological forms; the frequency of their development is presented in the table.

№ Types of ORS Number of cases % ra­tio

1. Mucous polyp 17 21.2%

2. Angiomatous polyp 4 5%

3. Inflammatory polyp 15 18.75%

4. Allergic polyp 5 6.25%

5. Glandular - cystic polyp 10 12.5%

6. Glandular-mucous polyp 15 18.75%

7. Adenomatous polyp 5 6.25%

8. Fibrous polyp 3 3.75%

9. Proliferating polyp with epithelial metaplasia 4 5%

10 Antrochoanal nasal polyp 2 2.5%

11. Total 80 100%

In the histological preparations of the first group in 80 patients with polypousrhinosi­nusitis, morphological changes in the mucous form are characterized by hyperplasia of the mucosal epithelium due to prolonged catarrhal inflammation and secretion of mucus by papil­lary growth, angiomatous - along with ele­ments of granulation were distinguished by an abundance of newly formed blood vessels of small caliber, and glandular forms with cystic changes in the lumen of the glands. In all ex­clusively forms, either focal, moderate, or dif­fuse inflammatory cell infiltration was noted, which indicated the duration of the process with periods of remission and exacerbation.

According to the results of a histological study of the second group of 18 patients, it can be noted that morphological changes are mainly characterized by cystic lesions of the mucosal glands, as well as integumentary epi­thelium with focal or diffuse inflammatory cell infiltration.

**Conclusion:** Thus, the above-described morphological changes in the nasal mucosa and paranasal sinuses, both in the first and sec­ond groups, characterize changes associated with a long-term course of the inflammatory process, a violation of the structural architec­tonics of the nasal tract, associated with epithe­lial hyperplasia, mucosal outgrowth and cystic formations, as well as the presence of elements of inflammation, in some cases, abundant se­cretion, which is accompanied by a violation of natural respiration, leads to the development of prolonged hypoxia. The obtained results of the morphological study provide a detailed de­scription of changes in the mucous membranes and clinical signs, make it possible to assess the risk of developing chronic polyposis rhi­nosinusitis, as well as to prevent relapses of the disease.

UDK: 577.17.049: 578.834.1

# ASSESSMENT OF SOCIO-PSYCHOLOGICAL RISK FACTORS FOR CARDIOVASCULAR DISEASES DURING THE COVID-19 PANDEMIC

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*Purpose: to study the psychological characteristics of COVID-19 in patients with cardiovascular diseases. Materials and research methods. The study included patients: patients with CVD, in the post-COVID period. Results. The results showed that in patients with CVD after suffering COVID-19, there is an increase in patients with subclinical and clinically significant anxiety compared with patients with previous COVID-19 without CVD. Also draws attention to the increase in the level of depression among the respondents. Thus, the level of clinically expressed depression pronounced changes in the psychophysiological status: according to the HADS scale, subclinical anxiety is determined 4.5 times more often, subclinical depression and clinical anxiety are diagnosed only in this group.*

***Key words:*** *СOVID-19, cardiovascular diseases, HADS scale, anxiety, depression.*

**COVID-19 PANDEMIYASI DAVRIDA YURAK QON-TOMIR KASALLIKLARI IJTIMOIY-PSIXOLOGIK XAVF OMILLARINI BAHOLASH**

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***Maqsad:*** *yurak-qon tomir kasalliklari (YQTK) bilan og'rigan bemorlarda COVID-19 ning psixologik xususiyatlarini o'rganish. Materiallar va tadqiqot usullari. Tadqiqot bemorlarni o'z ichiga oldi: COVID-19 dan keyingi davrda yurak-qon tomir kasalliklari bilan og'rigan bemorlar. Natijalar shuni ko'rsatdiki, COVID-19 bilan og'rigandan keyin yurak-qon tomir kasalliklari bilan og'rigan bemorlarda subklinik va klinik jihatdan ahamiyatli xavotirlanish beigilari YQTK bo'lmagan bemorlarga nisbatan solishtirganda ko'paydi. Shuningdek, respondentlar orasida depressiya darajasining oshishiga e'tibor qaratildi. Shunday qilib, klinik jihatdan ifodalangan depressiya darajasi 2 martadan ko'proq oshdi. YQTK bilan og'rigan bemorlarda psixofiziologik holatdagi o'zgarishlar yanada aniqroq bo'ldi: HADS shkalasiga ko'ra, subklinik xavotirlanish 4,5 baravar ko'proq aniqlandi, subklinik depressiya va klinik xavotirlanish faqat ushbu guruhda aniqlandi.*

***Kalit so'zlar:*** *COVID-19,**yurak-qon tomir kasalliklari, HADS shkalasi, havotirlanish, depressiya.*

**ОЦЕНКА СОЦИАЛЬНО-ПСИХОЛОГИЧЕСКИХ ФАКТОРОВ РИСКА СЕРДЕЧНО-СОСУДИСТЫХ ЗАБОЛЕВАНИЙ В ПЕРИОД ПАНДЕМИИ COVID-19**

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***Цель****: изучить психологические особенности СOVID-19 у пациентов с сердечно-сосудистыми заболеваниями. Материалы и методы исследования. В исследование включались пациенты: пациенты с ССЗ, в постковидном периоде. Результаты. Результаты показали, что у пациентов c ССЗ после перенесенной СOVID-19 наблюдается рост пациентов с субклинически и клинически выраженной тревогой по сравнению пациентами перенесенной СOVID-19 без ССЗ. Также обращает внимание рост уровня депрессии среди респондентов. Так, уровень клинически выраженной депрессии вырос более, чем в 2 раза.*

***Заключение****. У лиц с ССЗ имеются более выраженные изменения психофизиологического статуса: по шкале HADS субклиническая тревога определяется в 4,5 раза чаще, субклиническая депрессия и клиническая тревога диагностируются только в этой группе.*

***Ключевые слова:*** *СOVID-19, сердесно-сосудистые заболевания, шкала HADS, тревога, депрессия*

**Relevance.** The pandemic of corona­virus infection (COVID-19) caused by the new SARSCoV-2 virus has caused concern around the world health system. As a result of COVID-19, the respiratory system is most af­fected. However, this disease is characterized by high levels of inflammation and thrombotic complications leading to polyorgan damage. When treating patients with COVID-19, it is necessary not only to treat urticaria and respir­atory failure, but also to identify in a timely manner the damage to other target organs. An analysis of risk factors associated with severe COVID-19 progression and poor prognosis re­vealed the importance of comorbid pathology. Cardiovascular disease (CVD), arterial hyper­tension (AH), coronary heart disease (CHD), chronic heart failure (CHF), ventricular fibril­lation (VF), diabetes mellitus (DD), and chronic obstructive pulmonary disease are the leading causes of poor prognosis (COPD), chronic inflammatory bowel disease (CIBD), liver disease are included. Anxiety and its symptoms are associated with stress and have an objective or subjective effect on human life. In the context of the COVID-19 pandemic, the problem of anxiety is significant because: 1) the risk of infection and severity is high in the risk group (patients with chronic diseases) and causes stress in patients with persistent anxi­ety; 2) the need for isolation, sudden changes in the usual way of life, the risk of deterioration of the economic situation, a sudden decrease in physical activity and insolations are additional sources of stress; 3) the presence of a chronic stress state adversely affects the function of the immune system and worsens the course of chronic diseases, which are risk factors for se­vere COVID-19. Studies in 2020 showed a negative impact of isolation on human psy­chology, especially in patients with high anxi­ety against the background of mental illness [1,2, 10]. However, the dynamics of the men­tal state of people in continuous quarantine conditions have not been fully studied, includ­ing the dynamics of anxiety, which requires further investigation. Negative dynamics of anxiety levels may provide information on im­paired adaptation of a person to the resulting living conditions and are necessary to predict the level of labor activity [7,6]. Therefore, it is necessary to assess the dynamics of anxiety in order to identify and overcome the risks asso­ciated with social and psychological maladap­tation of the population. The effectiveness of such measures depends on informing the pop­ulation about the methods of individual pre­vention of anxiety in a pandemic [4]. Such measures include improving sleep patterns, re­lieving vitamin D deficiency [3] and omega-3 use [8], restricting intake of sugary foods and simple carbohydrates [10], taking pre- and pro­biotics, stopping alcohol intake, and increasing physical activity. increase, use of stress man­agement techniques (breathing exercises, med­itation, etc.).

**The purpose of the study.** To study the psychological changes caused by Covid-19 in­fection in patients with cardiovascular disease.

**Materials and methods of research.**  Patients with Covid-19 and non-Covid-19 were included in the study. Eligibility criteria: Patients aged 18–75 years with cardiovascular disease (ischemic cardiomyopathy, heart fail­ure NYHA I-III, AH, stable angina, ventricular fibrillation) and moderately severe COVID-19 confirmed by PCR. Criteria for rejection: pa­tients with severe course of the disease, pa­tients with IV FC CHF on NYHA, grade III respiratory failure.

All patients were divided into 2 groups: the first group - patients with COVID-19, with­out concomitant diseases, the second group - patients with COVID-19, patients with CVD. Disease and life history of patients, infor­mation on СVD were collected, the character­istics of COVID-19 transmission were fully studied. After questioning, the following scales were provided for completion: the HADS hospital scale for anxiety and depres­sion, and the DS-14 questionnaire to determine personality type. All patients underwent gen­eral clinical examinations, biochemical blood tests, ECG examinations. Excel (Microsoft Office 2016-2019 software package) and Sta­tistica 8.0 software package (Statsoft Inc., USA) were used for statistical analysis

**Results and analysis.** Anxiety is an in­dependent risk factor for the development of cardiovascular complications and consequent death. Patients with AIDS have a 1.6–2.2-fold increased risk of adverse events when symp­toms of depression are observed [9]. Table 2 shows the prevalence of symptoms of anxiety and depression in patients with COVID-19 who have had COVID-19 and who have had COVID-19 who have not had COVID-19. The assessment score on the HADS-A anxiety scale was 7.6 ± 5.2 points, and on the HADS-D depression scale it was 7.9 ± 3.8 points. Dif­ferent levels of anxiety were observed in 52.4% of patients, of which 18.2% had highly significant symptoms. Different degrees of de­pression were observed in 57.6% of patients, of which 19.2% had highly significant symp­toms. The co-occurrence of clinically signifi­cant anxiety and depressive symptoms (> 11 on both HADS scales) was detected in 8.3% of pa­tients. The results showed that subclinically and clinically significant anxiety symptoms in­creased in patients who underwent COVID-19 and those who underwent COVID-19 but who did not have COVID-19 (Table 1). It is also noteworthy that the level of depression among respondents has increased. Thus, the rate of clinically expressed depression increased more than 2-fold. Concerns were more specific to women: the HADS-A score was 7.9 ± 4.2 points in women and 6.8 ± 4.0 points (p <0.001) in men. There was no significant dif­ference in the symptoms of depression be­tween women and men: on the HADS-D scale, the score was 7.5 ± 3.8 points in women and 7.2 ± 3.8 points in men (p <0.01). Аnxiety symptoms were clinically significant in 52.1% of women and 34.6% of men (p <0.001), 28.7% of women, and 17.3% of men (p <0.001). A similar situation was observed in terms of depression: 43.8% of women with AIDS and 39.1% of men had different degrees of depression (p <0.05), 17.2% of women and 13.8% of men had depression. was significant. Concomitant cases of anxiety and depression were observed in more women (32.5% of women, 21.7% of men; p <0.001).

***Table №1***

**Anxiety and Depression Symptoms on Hospital Scales of Anxiety and Depression in Patients with CVD. Symptoms of anxiety and depression.**

|  |  |  |
| --- | --- | --- |
| Symptoms of anxiety and depression | Patients with CVD who underwent COVID-19  (n = 62) | Patients without CVD who underwent COVID-19  (n = 50) |
| Average score on HADS-A | 7,6±5,2 | 6,4±3,7 |
| Signs of clinical concern (HADS-A> 11 points), % | 18,2 | 16,5 |
| Signs of subclinical anxiety (8–10 points according to HADS-A), % | 34,2 | 27,6 |
| Average score on HADS-D, average ± OB | 7,9±3,8 | 7,7±4,2 |
| Clinically highly expressed depressive symptoms (HADS-D ≥11 points), % | 19,2 | 14,8 |
| Symptoms of subclinical depression (8-10 points on HADS-D), % | 38,4 |  |
| Concomitant symptoms of anxiety and depression (≥8 points according to HADS), % | 12,3 | 10,7 |
| Co-occurrence of clinically significant anxiety and depressive symptoms (≥11 on both HADS scales), % | 8,3 | 6,5 |

More subclinical and clinically signifi­cant depressive symptoms were observed in patients with CVD. Anxiety symptoms were also observed in women (Table №2).

Recently, new data on the role of psycho­social risk factors in the origin of NCDs are emerging. In addition to certain factors (family and work stress, low socioeconomic status, anxiety, depression), the recent European Rec­ommendations on CVD Prevention has identi­fied a personality factor that increases the risk of developing CVD and worsens the prognosis – type D personality (EACPR, 2012)

In our study, in the analysis of the DS-14 questionnaire, the “distressor” type of person­ality type D was found in one-third of patients in group 1, which was 2.7 times higher than in group 2. In addition, AG was found to be more pronounced in non-type D individuals than in non-CVD patients on the NA (negative affect) and SI (social depression) scales. It is known that in the D types of personality, the develop­ment of deeper experiences in stress is ob­served, compared to those who do not have a type D personality.

**Conclusion.** Significant changes in psy­chophysiological status were observed in pa­tients with CVD: 4.5 times more subclinical anxiety was observed on the HADS scale, and subclinical depression and clinical anxiety were detected only in this group. Individuality was found to be 2.7 times higher in patients with type D CVD.

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# SPECIFIC COURSE OF DIFFERENT GENESIS PARENCHYMATOUS HEMORRHAGIC STOKE

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***Annotation.*** *The article describes the specific course of parenchymal hemorrhagic stroke in patients with different comorbid conditions and their age and sex. Hemorrhagic stroke, especially parenchymal type, is one of the most common and topical medical and social problems. Cardiovascular and endocrine diseases are increasing the incidence of parenchymal type of hemorrhagic stroke as a background. As a result, patients have varying degrees of neurological disorders and premature death.*

***Relevance of the problem***

*An acute disorder of blood circulation in the brain is called a stroke. Ischemic, hemorrhagic and mixed strokes are distinguished. Ischemic stroke is a clinical syndrome that occurs as a result of a sudden decrease or cessation of blood flow in a specific part of the brain, the symptoms of which are detected more than 24 hours [1,2].*

*Hemorrhagic stroke occurs due to rupture of pathologically altered blood vessels or leakage of blood from the brittle vascular wall into brain tissue (perdiapedesis) [1,2].*

*Depending on the localization of the advanced hearth of the stroke, patients experience different movement and mental disorders. The majority of patients have speech (aphasia, dysarthria), writing (agraphia), reading (alexia), calculation (acalculia), thinking, movement (paresis, apraxia), cognitive (agnosia) attention and emotional (depression, apathy) disorders. [6].*

*Diabetes strokes increase the likelihood of developing 3-4 times and worsen the consequences [3]. Hypertension also plays a key role in the development of cerebral and large vascular atherosclerosis. Diabetes mellitus dramatically increases the risk of cerebral micro-, macroangiopathy, dysmetabolic syndrome, frequent hypo- and hyperglycemic changes in the blood, as well as arterial hypertension, aneurysms and hemorrhagic stroke. Hemorrhagic stroke is known to be less common than other strokes, but it is a disease that is more common in middle-aged people with disabilities, a sharp decline in vital functions, and a high mortality rate [7]. Although neuroimaging and blood biochemical analysis are currently sufficient to diagnose hemorrhagic stroke, our studies have shown that hemorrhagic stroke is more severe, acute, early and late postoperative recovery period, prognosis, and mortality are more severe in patients with type 2 diabetes. Nevertheless, effective treatments and positive rehabilitation studies for hemorrhagic stroke patients with type 2 diabetes mellitus are still puzzling.*

***Keywords****: hemorrhagic stroke, parenchymatosis, diabetes, hypertension, atherosclerosis.*

**The purpose of the study**

To study the specific course of parenchy­mal hemorrhagic stroke observed in patients with different comorbid background.

**Research material and methods**

The study material was obtained from 35 patients treated for parenchymal hemorrhagic stroke in the Department of Intensive Neurol­ogy of the Tashkent Medical Academy in 2020-2021. Group 1 of patients consisted of 12 patients with parenchymal hemorrhagic stroke developed on the basis of hypertension and type 2 diabetes. In group 2, 21 patients with hypertension and parenchymal hemorrhagic stroke formed on the basis of atherosclerosis were discharged. It was also found that paren­chymal type of hemorrhagic stroke in two pa­tients developed against the background of ar­terio-venous malformation and cavernoma re­spectively. The clinical course of the disease in these patients, brain MSKT examination, la­boratory analyzes were studied, and Barthel Scale is used to measure performance in activ­ities of daily living (ADL) and NIHSS is for analysis of neurological disorders.

**Discussion and results**

Of the 35 patients studied, 12 (34.3%) had previously been treated for hypertension and type 2 diabetes mellitus and had developed a parenchymal type of hemorrhagic stroke. 3 of them (25.0%) are women and 9 (75.0%) are men. All patients were over 50 years of age, 7 people (58.3%) aged 50-65 years, and 5 people (41.7%) over 65 years of age.

Group 2 that is the parenchymal type of hemorrhagic stroke, accounted for 9 (43.0%) women and 12 (57.0%) men in 21 patients who developed hypertension and atherosclerosis. Patients in this group were conditionally di­vided into 4 age levels: the number of patients under 40 years of age was 2 (10.0%), patients aged 40-50 years were 4 people (19.0%), pa­tients aged 50-65 years were 12 people (57.0). %), And adults over 65 years of age ac­counted for 3 (14.0%) patients (Table 1).

**Table 1. Distribution of patients by sex and age**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group | Sex | Age | | | | Total |
| **Under 40 years old** | **40-50 years old** | **50-65 years old** | **Over 65 years old** |
| 1 group | Women | 0 | 0 | 1 | 2 | 3 |
| Men | 0 | 0 | 6 | 3 | 9 |
| 2 group | Women | 2 | 1 | 5 | 1 | 9 |
| Men | 0 | 3 | 7 | 2 | 12 |
| Total |  | 2 | 4 | 19 | 8 | 33 |

In the acute phase of parenchymal hem­orrhagic stroke, the disease recurred in 1 pa­tient (8.3%), and another 1 patient (8.3%) died of cerebral edema. Seven of the 11 surviving patients (63.6%) were diagnosed with severe daily life disturbances and severe neurological disturbances on the Bartel and NIHSS scales, while the remaining 4 patients (36.4%) had moderate daily activity limitations and moder­ate neurological disturbances (Fig. 1,2).

**Figure 1. Barthel scale summary**

Patients who developed parenchymal hemorrhagic stroke on the background of hy­pertension and atherosclerosis were assessed on the Barthel and NIHSS scales. functional impairment and moderate neurological impair­ment, in 7 patients (33.0%) there was a re­striction of average daily life activity and mild neurological disorders, and in the remaining 3 (14.0%) there were mild neurological disor­ders without impairment of daily life activities. In this group of patients, no deaths were ob­served due to parenchymal hemorrhagic stroke during the acute, subacute, and early recovery periods of the disease.

**Figure 2. NIHSS scale summary**

When the parenchymal type of hemor­rhagic stroke was analyzed according to the lo­cation of the brain, parenchymatous hemor­rhagic stroke occurred in the left hemisphere in 8 patients (66.7%) and in the right hemisphere in the remaining 4 patients (33.3%) in group 1. In group 2 patients, 14 (66.7%) were in the left hemisphere, 2 (9.5%) were in the left hemi­sphere, 1 patient (4.8%) was in the left hemi­sphere, and the remaining 4 (19.0%) were in the left hemisphere. parenchymal hemorrhage was detected in the right cerebral hemispheres. (Fig.2).

**Conclusion**

The study found that 8.3% of deaths were observed in patients with group 1, i.e., parenchymal hemorrhagic stroke, type 2 diabe­tes mellitus, and hypertension, and recurrence in the acute phase of the disease in 8.3%. In all 91.7% (11) of the surviving patients, cocktail incompetence was observed. Mortality was not observed at all in patients with parenchyma­tous hemorrhagic stroke, which developed against the background of group 2 hyperten­sion and atherosclerosis, and 47.6% of patients returned to work as early as the period of early recovery from the disease. In both groups, male patients aged 50–65 years predominated, and the parenchymal type of hemorrhagic stroke was more common in the left cerebral hemispheres.

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# THE EFFECTIVENESS OF ANTICOAGULANT THERAPY IN COVID-19 ASSOCIATED ISCHEMIC STROKE

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*This article analyzes the effects and efficacy of various anticoagulant agents on hemorheological indicators used in Covid-19 associated ischemic stroke and post treatment results in the early stages of the disease are presented.*

***Keywords:*** *Covid-19, SARS-CoV-2, ischemic stroke, activated partial thromboplastin time, D-dimer, fibrinogen, prothrombin time, heparin, enoxiparin, rivaroxaban.*

It is known that the SARS-CoV-2 virus can infect the central nervous system [1–2], and COVID-19 can cause a prothrombotic state [3]. Since the start of the SARS-CoV-2 pandemic in 2019, there has been growing ev­idence of neurological complications associ­ated with COVID-19. Although SARS-Cov-2 predominantly causes acute respiratory syn­drome, it can present with a variety of symp­toms. Neurological symptoms, including head­ache, dizziness, cranial nerve injury (anosmia), cerebrovascular disease, and encephalopathy may develop alone or in parallel with respira­tory distress in the early stages of COVID-19 infection [4]. The association of cerebrovascu­lar accident with severe COVID-19 was first studied in a retrospective study conducted in China with 214 patients with COVID-19; four ischemic strokes (IS) were registered [5]. In a meta-analysis of 18 groups of studies involv­ing 67,845 patients with COVID-19 infection, cases of ischemic stroke were registered in 1.1% of patients [3,6,8]. Increased prothrom­bin and activated partial thrombo­plastin time (APTT) in COVID-19 infection increase the risk of IS [9]. The pathophysiol­ogy of IS in COVID-19 is explained by the classical Vir­chow triad [7]: 1) damage by viral interactions with enzyme type 2 receptors that convert en­dothelium to angiotensin 2) endocytosis of the virus leads to the release of anti-inflammatory cytokines - "cytokine storm", hypercoagula­tion is observed 3) hyperfibrinogenemia leads to an increase in the blood coagulation system. The presence of cerebrovascular disease is a high risk factor for poor prognosis in patients with severe COVID-19. Preliminary research evidence suggests that SARS-CoV-2 infection can induce IS through viremia, hypercoagula­bility, endothelial dysfunction, and cardio­genic embolism associated with local and sys­temic immune-inflammatory processes. In this case, anticoagulant drugs in patients with COVID-19 are an important part of the treat­ment process.

**The purpose of the study:**To study the effect of various anticoagulant agents used in Covid-19 associated ischemic stroke on hem­orheological parameters, as well as to analyze the results of treatment in the early stages of the disease.

**Research material and methods of study:** The criteria for inclusion of 62 patients selected for the study were: рositive result of polymerase chain reaction confirming COVID-19 infection, the presence of signs of interstitial pneumonia on computerized tomog­raphy examination of lung tissue, confirmation of infarct-specific symptoms in brain tissue by computerized tomography examination, and the presence of clinical signs specific to COVID-19 infection was consid­ered.These patients (n = 62) were conditionally divided into three groups. In the group A, n = 33 (53.12%) patients who received heparin as an anticoagulant therapy at 24000-36000 ED per day for 2 weeks, n = 17 (27.4%) patients in the group B received enoxiparin 1 mg / kg / day for 2 weeks, and group C consisted of n = 12 (19.4%) patients received rivaroxaban 15-20 mg per day. Hemorheological parameters (D-demir, INR, fibrinogen, prothrombin time, APTT) were examined in all patients selected for the study on the day and 2 weeks after ap­plication and monitored for 1 month.

**The results of the study**: When analyz­ing the age and sex of all 62 patients in the study, the average age was 64.2±2.1, of which the proportion of men and women were 59.7% (n=37); 40.3% (n=25) respectively. As a result of anticoagulant therapy, D-dimer parameters regression was found, in group A patients from 581.4±1.6 ng / ml to 334.8±2.1 ng/ml, and in group B patients from 628.6±1.4 ng / ml to 336.7±2.3 ng / ml, and in group C patients from 541.1±1.9 ng/ml to 496.6±1.4 ng/ml (p<0.001). Fibrin degradation product parame­ters regressed from 7.71±1.1 μg/ml to 3.6±1.3 μg / ml in group A patients and from 7.42±0.9 μg/ml to 3.8±1.19 μg/ml in group B patients, from 7.52±1.2 μg/ml to 3.71±1.3 μg/ml in group C patients (p<0.005). Prothrombin time parameters in group A patients reduced from 15.2±1.1 sec to 9.4±0.8 sec, in group B patients from 14.9±1.1 sec to 9.6±0.8 sec, and in group C patients from 15.6±1.1 sec to 9.2±0.8 sec (p<0.001). APTT parameters decreased from 31.51±1.29 sec to 24.16±0.8 sec in group A pa­tients, from 28.2±1.71 sec to 26.9±1.65 sec in group B patients, and from 29.76±1.13 sec to 25.21±1.26 sec in group C patients. (p<0.001). (Table 1).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Intergroup changes ofhemorheological parameters | | | | | | | |
| № | Hemorheological indicators | Group A: Heparin | | Group B: Enoxiparin | | Group C: Rivaroxaban | |
| Initially | After  2 weeks | Initially | After  2 weeks | Initially | After  2 weeks |
| 1 | D-dimer | 581.4 ± 1.6 ng / ml | 334.8 ± 2.1 ng / ml | 628.6 ± 1.4 ng / ml | 336.7 ± 2.3 ng / ml | 541.1 ± 1.9 ng / ml | 496.6 ± 1.4 ng / ml |
| 2 | Fibrinogen | 7.71 ± 1.1 μg / ml | 3.6 ± 1.3  μg / ml | 7.42 ± 0.9 μg / ml | 3.8 ± 1.19  μg / ml | 7.52 ± 1.2 μg / ml | 3.71 ± 1.3 μg / ml |
| 3 | Prothrombin time | 15.2 ± 1.1  sec | 9.4 ± 0.8  sec | 14.9 ± 1.1  sec | 9.6 ± 0.8  sec | 15.6 ± 1.1  sec | 9.2 ± 0.8  sec |
| 4 | APTT | 31.51 ± 1.29 sec | 24.16 ± 0.8 sec | 28.2 ± 1.71 sec | 26.9 ± 1.65 sec | 29.76 ±1.13 sec | 25.21±1.26  sec |

The table shows that when we compared with pre-treatment hemorheological parame­ters after 2 weeks, the following percentages decreased in groups A, B, and C: D-dimer 42.4%; 46.4%; 8.2%; respectively (p<0.001), fibrin degradation products 53.3%; 48.8%; 50.7%; respectively (p<0.001), prothrombin time 38.1%; 35.6%; 41.1%; respectively (p<0.001), APTT 23.3%; 4.6%; 15.3%; respectively (p<0.001). (Table 2).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Percentage changes in hemorheological indicators in groups | | | | |
| № | Hemorheological indicators | Group A:  Heparin | Group B:  Enoxiparin | Group C: Riva­roxaban |
| 1 | D-dimer | 42.40% | 46.40% | 8.20% |
| 2 | Fibrinogen | 53.30% | 48.80% | 50.70% |
| 3 | Prothrombin time | 38.10% | 35.60% | 41.10% |
| 4 | APTT | 23.30% | 4.60% | 15.30% |

The results of our study showed that among all patients (n = 62) mortality was observed in 22.5% (n = 14) due to acute respiratory distress syndrome (ARDS), the incidence of disability was 45.2% (n = 28) and 32.3% (n = 20) patients were discharged from the hospital with positive results (Table 3).

|  |  |  |  |
| --- | --- | --- | --- |
| Early catamnestic outcomes of treatment | | | |
| № |  | Number | percentage |
| 1 | Deaths (ARDS) | 14 | 22.5% |
| 2 | Disability status | 28 | 45.2% |
| 3 | Positive indicators | 20 | 32.3% |

**Conclusion:** Among the hemorheologi­cal indicators, all anticoagulants have a signif­icant positive effect on fibrinogen and pro­thrombin time, heparin and enoxyparin are ef­fective against D-dimer, heparin and riboraxa­ban are effective against APTT. However, ri­boraxaban has almost no positive effect on D-dimer while enoxiparin has almost no positive effect on APTT. Heparin in the treatment of acute thromboembolic complications in sepsis-induced hypercoagulability in the acute period of COVID-19 infection, enoxiparin in the treatment of any acute thromboembolic com­plications against the background of hyperco­agulability but sepsis is not observed, and rivaraxoban in the treatment of hypercoagula­bility without thromboembolic complications in COVID-19 infection.

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# CLINICAL AND BIOCHEMICAL PARAMETERS OF PATIENTS WITH COVID-19 WITH IMPAIRED LIVER FUNCTION BEFORE AND AFTER TREATMENT

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***Annotation.*** *In this article, the clinical and biochemical parameters of patients with coronavirus infection and elevated levels of liver enzymes were studied before and after 3 months of drug therapy. Postcovid symptoms were analyzed.*

***Keywords:*** *COVID-19, AlAT, AsAT.*

**COVID-19 БИЛАН КАСАЛЛАНГАН, ЖИГАР ФАОЛИЯТИ БУЗИЛГАН БЕМОРЛАРДА, ДАВОЛАНИШДАН ОЛДИНГИ ВА КЕЙИНГИ КЛИНИК - БИОКИМЁВИЙ КЎРСАТКИЧЛАРИ**

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***Аннотация.*** *Ушбу мақолада коронавирус билан касалланган, жигар ферментлари ошган ва 3 ойлик медикаментоз давони ўтган беморларнинг клиник - биокимёвий кўрсаткичлари ўрганилган. Улардаги постковид симптомлар таҳлили ўтказилган.*

***Калит сўзлари:*** *COVID-19, АлАТ , АсАТ.*

**КЛИНИКО-БИОХИМИЧЕСКИЕ ПАРАМЕТРЫ БОЛЬНЫХ С COVID-19 С НАРУШЕНИЕМ ФУНКЦИИ ПЕЧЕНИ ДО И ПОСЛЕ ЛЕЧЕНИЯ**

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***Аннотация.*** *В этой статье были изучены клинико-биохимические показатели больных с коронавирусной инфекцией и повышенным уровнем печеночных ферментов до и после 3 месяцев медикаментозной терапии. Был проведен анализ постковидных симптомов.*

***Ключевые слова:*** *COVID-19, AлАТ, AсАТ.*

**Relevance.** The pandemic caused by SARS-CoV-2 (COVID-19) is a serious prob­lem for the world medical and practical health system. In many countries, health profession­als are considering not only the treatment of the acute stage of the disease, but also the means and methods of recovery and return of patients to a normative lifestyle. In patients who have experienced a new coronavirus in­fection, the issues of medical rehabilitation have been interest to many countries, medical specialties. A lot of researchs were carried out by scientists from around the world. Ap­proaches and methods of medical rehabilita­tion are different, but all scientists are sur­prised that there is a need for it [3].

G.E. Ivanova and others (2020) [1] after an acute period of coronavirus infection, the first two months write that breathing is the best time to recover, which they believe is the ther­apeutic window period. In order to plan a per­sonal medical rehabilitation program and as­sess the safety of planned rehabilitation activi­ties, it is necessary to check patients with COVID-19. A.N. Razumav and others. (2020), rehabilitation measures significantly restore respiratory function in patients, improve qual­ity of life, temporarily reduce disability dura­tion and primary disability cases. Physical ex­ercises are the basis of rehabilitation programs for pulmonic patients, depending on their im­pact, intensity, time and location of the lesion. Physical exercise has a positive effect on phys­ical, psychological health and quality of life in patients with COVID-19[2].

Given the scale of the pandemic out­break, thousands of people will need medical rehabilitation, which encourages the health care system to develop effective and cost-ef­fective methods in turn. It should be said that in patients who has undergone severe pneumo­nia, there is a decrease in physical movement, work capacity and quality of life, which ulti­mately indicates the economic importance of medical rehabilitation [5].

Each patient with coronavirus, regard­less of the severity of the disease, must un­dergo rehabilitation. Lack of rehabilitation this is not only a problem of neighboring countries, but also a huge gap of Uzbekistan.

**Aim of the study**: to identify post-trau­matic syndromes in patients with COVID-19, after 3 months of medicamentous treatment, and to recommend a differentiated rehabilita­tion program to them.

**Materials and methods of the study**: in our study, Casals with an increase in cytolytic indices of 110 units were selected. They re­ceived ursodezoxyholic acid (250 mg, daily dose 10-15 mg/kg, 2-3 times) for 3 months. Af­ter 90 days, a re-survey and laboratory exami­nation were conducted from them.

**Results and discussion:**

We studied the clinical-laboratory char­acteristics of patients and obtained the follow­ing results when we separated our patients by age, gender (Table 1). In the study, the distri­bution of men and women does not differ greatly: men 56,4% and women 43,6%. The average age of the studied patients was 47,27 ±14,91. The average duration of hospitaliza­tion of patients was 12,4 ±4,28 days.

***1-graph***

**Age and sex characteristics of patients (n=110)**

|  |  |  |  |
| --- | --- | --- | --- |
| № | indicators | achievement | |
| 1 | men and women | % | 56,4/43,6 |
| 2 | age (n=110) | M±m (ёш) | 47,27±14,91 |
| 3 | average duration of stay in the hospital  (n=110) | M±m (кун) | 12,4±4,28 |

The analysis of the distribution of the disease according to the severity of the disease, depending on the age group, is presented in Ta­ble 2. The table shows that in the young and middle-aged group, the heavy course of COVID -19 was predominant. In elderly pa­tients who participated in the study, the occur­rence of the disease with an average weight was observed more often.

***2- graph***

**Age and sex characteristics of patients** (n=110)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Age groups | total | The course of the disease with moderate severity | Severe course of the disease | p |
| Young people  (18-44 age) | 48 (43,6%) | 42 (43,3%) | 6 (46,1%) | - |
| Middle age  (45-59 age) | 38 (34,5%) | 33 (34,1%) | 5 (38,4%) | *-* |
| Elderly person  (60-74 age) | 23 (20,9%) | 21 (21,6%) | 2 (15,3%)\* | *P>0,05* |
| Older people  (75-90 age) | 1 (0,9%) | 1 (1,03%) | - | - |
| Total | 110 (100%) | 97 (100%) | 13 (100%) | - |

The study of the meeting of the main complaints of patients showed that they often had an inertia in general (93.6%) and a de­crease in appetite (75.5%). 48.2% of patients noted lack of taste and smell. Nausea was ob­served in 30.9% of patients. 7,3% of patients complained of vomiting. 9.1% of patients com­plained of diarrhea and muscle pain (Figure 2).

Analysis of the prevalence of somatic pa­thology is presented in Figure 3. On the graph, it can be seen that the diseases of bitumen (25,5%) and hypertension disease (30%) are most often detected. ischemic heart diseasesuf­fered in 14.5% of patients, cholecystitis – 9.1%, obesity – 8.2%, type 2 diabetes – 6.4%, ulcer - 5.5%, gastritis - 4,5%, pancreatitis – 4,5%, chronic hepatitis - 2.7% of patients. Anemia was detected at 0,9% (Figure 3).

**2-picture. Prevalence of complaints in studied patients (n=110)**

**3-picture. Prevalence of major somatic diseases in studied patients (n=110)**

We studied the body weight index (BWI) of all patients (Table 3). We can see from the table that the severe course of the disease was observed in those with 2 degree of obesity (BWI 35-40). Excess weight was present in those who underwent the disease with moder­ate severity (BWI 25-30). There was no weight loss among all the muscles.

***3- graph***

**Distribution of the disease weight level depending on the body weight index**

|  |  |  |  |
| --- | --- | --- | --- |
| BWI indicator | Moderate severe course of the disease | Heavy evening | p |
| BWI <18,5  (weight loss) | - | - | - |
| BWI = 18,5-25  (standard) | 22 (20%) | - | - |
| BWI = 25-30  (excess weight) | 48 (43,6%) | - | - |
| BWI = 30-35  (obesity 1 degree) | 27 (24,5%) | 2 (1,8%)\* | *P>0,05* |
| BWI = 35-40  (obesity 2 degree) | - | 11 (11%) | - |
| total | 97 (88,1) | 13 (11,8%)\* | *P>0,05* |

The results of biochemical analysis, were presented in Table 4. The average index of AlAT and AsAT was 43,4±31,59 and 37,57±27,43 ED at the norm border. The aver­age amount of total bilirubin is 9,78±4,1 mmol / l. The total protein is 75,72±3,76 g / l. On av­erage, the amount of albumin is 37,02±2,36 g / l. Most patients, there was an increase in C re­active protein, 36,8±45,09 ED. The sugar con­tent in the blood was within the norm range, indicating 5,33±1,96 mmol/l. By involving us an increase in the amount of creatinine in the blood was equal to 92,65±25,73 mmol/l. Mo­chevina showed the last limit of the norm in the blood 5,87±1,9 mmol / l. Lactatdegidroginase (LDG) and amylase were detected in some pa­tients 240505±59,22 ED/l and 137,95±29,72 ED/l.

***4- graph***

**Features of biochemical parameters of blood**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **№** | **Indicators** | **Results** | | **Normative indicators** |
| 1 | AlAT (n=110) | M±m | 43,4±31,59 | <40 Ед/л |
| 2 | AsAT (n=110) | M±m | 37,57±27,43 | <35 Ед/л |
| 3 | bilirubin (n=110) | M±m | 9,78±4,1 | 3,4-20,5 ммоль/л |
| 4 | albumin (n=110) | M±m | 37,02±2,36 | 35-55 г/л |
| 5 | C reactive protein (n=110) | M±m | 36,8±45,09 | 0-6 мг/л |
| 6 | Glucose (n=110) | M±m | 5,33±1,96 | 3,2-6,1 ммоль/л |
| 7 | creatinine (n=46) | M±m | 92,65±25,73 | 44-115 ммоль/л |
| 8 | Mochevina (n=110 | M±m | 5,87±1,9 | 2,5-8,3 ммоль/л |
| 9 | Total protein (n=110) | M±m | 75,72±3,76 | 66-85 г/л |
| 10 | Calcium (n=43) | M±m | 2,1±0,15 | 2-2,6 ммоль/л |
| 11 | Cholesterin (n=22) | M±m | 3,18±0,79 | <5,2 ммоль/л |
| 12 | Triglyceride (n=15) | M±m | 2,35±0,76 | <2,28 ммоль/л |
| 13 | LDG (n=17) | M±m | 245,05±59,22 | 225-450 ЕД/л |
| 14 | α- amylase (n=17) | M±m | 137,95±29,72 | 0-220 ЕД/л |

We studied the results of a survey and laboratory analysis after 3 months of medicamentous treatment. We analyzed the most disturbing complaints of patients, that is, the post-traumatic symptoms and placed them on the diagram (Figure 3).

As can be seen from the diagram, most often encountered general inertia, nutritional deficiency, depression, changes in the diges­tive system and the bone marrow.

Changes in liver aminotransferases were compared among themselves (Table 5). The maximum increase in AlAT and AsAT was ob­served in 5 days of follow-up. The average AlAT index was 43,4±31,59 until treatment, while 5 days were 102,59±75,93. Monitoring of cytolytic indicators showed that Alat nor­malized after 3 months 34,55±13,52.

***5- graph***

**Dynamics of aminotransferases in the general group of patients (n=110).**

|  |  |  |  |
| --- | --- | --- | --- |
| indicators | until treatment | 5-day | After 3 months |
| AlAT | 43,4±31,59 | 102,59±75,93 | 34,55±13,52 |
| AsAT | 37.57±27,43 | 65,79±47,95 | 21,6±8,55 |

AsAT the mean amount of treatment was 37,57±27,43, 5 days, up to 65,79±47,95. The monitor of AsAT returned to the norm after 3 months 21,6±8,55.

Despite the 5th table, even after 3 months, there was an increase in liver ferment in some patients. They were 22 patients, 17 of them were young people. It turned out that in 22 patients with high BWI. This means that most young people, excess weight and obesity are observed, as long as the cytolytic indicators are high.

**Conclusion**.

1. Medical rehabilitation, complaints are observed in patients, which in turn requires complex rehabilitation for 3 months.

2. Patients were more likely to have com­plaints, which were mainly nutritive, specific to the movement and nervous system, need to choose diffirencial rehabilitation for such pa­tients.

3. Liver fermens were detected in pa­tients who did not return to the norm, even af­ter the treatment of medikamentosis. They were formed mainly by young people; it was determined that young people have different levels of obesity.

4. At times, correctly selected and early-onset rehabilitation can reduce syndrome of encountering post-traumatic syndromes

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# USE OF NEUROPROTECTIVE – GLIATILIN IN THE TREATMENT OF OPTIC NERVE ATROPHY

**ЛЕЧЕНИЕ АТРОФИИ ЗРИТЕЛЬНОГО НЕРВАС ИСПОЛЬЗОВАНИЕМ НЕЙРОПРОТЕКТОРА - ГЛИАТИЛИНА**

**KO’RUV NERVI ATROFIYASINI NEYROPROTEKTOR- GLIATININNING QO’LLANILISHI**

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*The effectiveness of treatment of partial atrophy of the optic nerve of various origins with a peptide bioregulator (gliatilin) ​​was studied. Patients with partial atrophy of the optic nerve of various etiologies were treated. The first group (main) included 30 patients (34 eyes) who were treated with gliatilin parabulbar. The second group (control) - 28 patients (36 eyes) was treated according to the traditional scheme (use of vasodilator, vitamin-tissue therapy).*

***Key words****:* *optic nerve atrophy, peptide preparations.*

**Relevance.** Partial atrophy of the optic nerve is a severe pathology of the organ of vi­sion, leading to low vision, blindness, and dis­ability [1].

Currently, the diagnosis, treatment and rehabilitation of patients with partial atrophy of the optic nerve is considered as an important medical and social problem. The steady in­crease in the disability of the population due to this pathology indicates the insufficient effec­tiveness of the traditional system rehabilitation activities. 98% of visually impaired people with optic nerve atrophy need social rehabili­tation. Optic nerve atrophy is a polyetiological disease and is the end result of a whole group of pathological conditions of the body.

Modern methods of treatment of patients with partial atrophy of the optic nerve include the use of pharmacotherapy (vasodilators, met­abolic drugs with the use of both periocularly in the form of injections and with the help of various irrigation systems). In recent years, peptide bioregulators have been widely used in clinical practice for the prevention and treat­ment of various diseases of the organ of vision. In modern medicine, bioregulatory therapy is a promising direction of pathogenetic influence [4].

The use of cytomedines contributes to the restoration and preservation of the regula­tory mechanisms for the synthesis of the nec­essary protein substrates, which leads to the normalization of homeostasis and an increase in the intensity of the protective functions of the body.

In the Termizi branch of the Tashkent Medical Academy on the basis of the Depart­ment of Ophthalmology, as well as in the Termizi branch of the Republican Scientific and Practical Center for Eye Microsurgery from 2021 to 2022. gliatilin was used in the treatment of optic nerve atrophy.

Gliatilin was administered in the form of parabulbar injections.

**Purpose of the study.** To study the ef­fectiveness of treatment of partial atrophy of the optic nerve of various origins with the pep­tide bioregulator gliatilin.

**Materials and methods**

Under observation were 58 patients (70 eyes) aged 25 to 69 years with unilateral or bi­lateral partial atrophy of the optic nerve of var­ious etiologies. The patients are divided into two groups. The first group (main) included 30 patients (34 eyes) who were treated with gliatilin parabulbarno for 10 days, 2.5 mg daily.

The second group (control) included 28 patients (36 eyes) who were treated according to the traditional scheme. Traditional therapy included: parabulbar trental, emoxipin under the conjunctiva, B vitamins subcutaneously, biostimulants (fibs, aloe s/c), physiotherapy (biomag, etc.).

The etiological factors in the develop­ment of partial optic nerve atrophy (POA) were: primary open-angle glaucoma, postis­chemic neuroopticopathy, intoxication, post-concussion nature.

Before the start of treatment, a therapist, a neuropathologist, examined all patients. If necessary, MRI examination of the brain was performed. In case of pathology, somatic pa­thology was corrected. Ophthalmological ex­amination included visometry, perimetry, computerized perimetry, tonometry, electro­physiological studies of the functional state of the visual analyzer (VEP).

According to the initial visual acuity, the patients were presented:

Distance visual acuity was determined according to the Sivtsev-Golovin tables, with the help of sign projectors, which is part of the Thorson ophthalmological workplace, the study of the visual field was carried out on the PRP-60 arc projection perimeter, on the Humphrey visual field analyzer. Biomicros­copy was performed using slit lamps. Ophthal­moscopy was performed in reverse and direct view, as well as examination of the fundus with a three-mirror lens. Electrophysiological study of EFI (visual evoked potentials VEP) was car­ried out using the system for EFI Neuropto "Medelec" (England).

Visual functions were monitored for 10 treatments. Courses of complex therapy were repeated after 3 months. The observation pe­riod is 6 months.

Distribution of patients depending on the etiology of partial atrophy of the optic nerve

***Table №1***

|  |  |  |
| --- | --- | --- |
| **Types of PRIN** | **Main group** | **Control group** |
| Glaucomatous | 18 (18 eyes) | 15 (17 eyes) |
| Postischemic | 7 (10 eyes) | 6 (9 eyes) |
| Post-intoxication | 2 (3 eyes) | 3 (6 eyes) |
| Post-traumatic | 3 (3 eyes) | 4 (4 eyes) |
| Total | 30 (34 eyes) | 28 (36 eyes) |

**Distribution of patients according to initial visual acuity**

***Table №2***

|  |  |  |
| --- | --- | --- |
| **Initial visual acuity** | **Main group** | **Control group** |
| Up to 0,09 | 46,43% | 48,24% |
| 0,1 and above | 53,57% | 51,76% |

**Results and discussion**.

After the treatment, all patients from the main group noted an improvement in their gen­eral condition, motor activity, mental perfor­mance, as well as normalization and stabiliza­tion of blood pressure in patients with hyper­tension. Improvement in visual acuity and ex­pansion of the total boundaries of the visual field (SGFS) was noted in 83.3% in the main group, in the control group, an improvement in visual acuity in 51.7% and 48.4% showed an expansion of SGFS.

An increase in visual acuity by 0.06 was observed in patients in the main group with an initial visual acuity of up to 0.09, and by 0.2–0.3 (with an initial visual acuity of 0.1 and higher). While patients in the control group showed an increase of 0.03 (with initial visual acuity up to 0.09) and 0.1 (with initial visual acuity of 0.1 and above).The expansion of the total boundaries of the visual field (ETFS) in the main group was noted by 20–35 degrees, while in the control group there was an expan­sion of the total boundaries of the visual field up to 20 degrees.

Changes have also been made in EFI pa­rameters before and after treatment.

According to computer perimetry, there was a decrease in relative absolute scotomas, an increase in fovea sensitivity by 2–3 DB in the control group and by 3–5 DB in the main group.

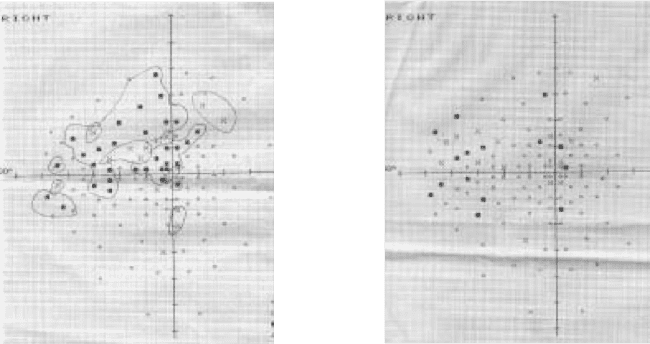
**Example.** Patient B. Diagnosis: Partial postischemic atrophy of the optic nerve. Re­sults of computerized perimetry before and af­ter treatment.

Indicators of visually evoked potentials for a flash (changes in latency, m/sec)

***Table №3***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Types of PNAD** | **Before treatment** | | **After treatment** | |
| **Main gr.** | **Control gr.** | **Main gr.** | **Control gr.** |
| PANS glaucomatous | 127±1 | 127±1 | 126±2 | 127±1 |
| POI postischemic | 130±2 | 130±2 | 128±2 | 130±2 |
| PONS post-intoxication | 130±3 | 130±3 | 128±1 | 130±2 |
| POF post-traumatic | 128±1 | 128±1 | 127±1 | 128±1 |

**Picture №1**



At the same time, it should be noted that in patients of the main group, visual functions remained or decreased insignificantly after 6 months after the treatment, while in the control group, visual functions returned to baseline data.

**Conclusion.**

Thus, the use of the proposed complex of therapeutic measures using the peptide regula­tor gliatilin in patients with partial atrophy of the optic nerve made it possible to increase the stabilization of visual functions in patients in 83.3%, and also to learn about the long-term effects of this drug.

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# CLINICAL-NEUROLOGICAL AND DOPPLEROGRAPHIC INDICATIONS IN ATHEROMBOTIC ISCHEMIC STROKE

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**The aim of the study:** Study of clinical-neurological and dopplerographic features in atherombotic ischemic stroke.

**Research material and research meth­ods:** 62 patients were selected for the study. They were divided into two groups: group I consisted of 32 patients with ischemic stroke and anamnesis with stenosis on dopplero­graphic examination, and group II with 30 pa­tients without stenosis on dopplerographic ex­amination with ischemic stroke. NIHSS scale and dopplerographic examinations were per­formed in all patients selected for the study.

**Results:** When analyzing the age and sex of all patients in the study, the average age of first group was 67.4±2.3, of which the propor­tion of men and women were 56.2% (n=18); 43.8% (n=14) respectively. The average age of second group was 63.1±2.3, with the propor­tion of males being 63.3% (n=19) and females being 36.6% (n=11). The mean severity of is­chemic stroke in patients on the NIHSS scale averaged 23.68 ± 6.26 in group I and 16.13 ± 8.16 in group II. The results of our month-long study showed that among patients in first group (n=32) the mortality rate was 12.5% (n=4), the incidence of disability was 53.1% (n=17) and 34.4% (n=11) patients were discharged from the hospital with positive results. No deaths were observed among patients in second group (n=30), but the incidence of disability was 26.6% (n=8) and 73.3% (n=22) patients were out of the hospital with positive results.

**Conclusions:** In the analysis of patients selected for the study on the NIHSS scale, the severity of stroke was 1.5 times higher in group I and 2 times higher than in group II, and the mortality rate in group I was 12.5%.

УДК 616-006

# TRIMODAL THERAPY AS AN ORGAN-PRESERVING METHOD OF TREATMENT FOR BLADDER CANCER

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***ABSTRACT****. Purpose of Review: Radical cystectomy is the gold standard treatment for muscle invasive bladder cancer, but some patients have medically inoperable disease or refuse cystectomy to preserve their bladder function. Bladder preservation therapy with transurethral resection of the bladder tumor and concurrent chemo-radiotherapy, known as trimodal treatment (TMT), is regarded to be a curative-intent alternative to radical cystectomy for patients with muscle invasive bladder cancer, during the past decade. Organ-preserving trimodality therapy has become an accepted alternative to cystectomy for selected muscle invasive bladder cancer (MIBC) patients unfit for cystectomy or opting for bladder preservation. Here, we will review and summarize the modern advances and emerging data supporting the use of trimodality therapy as an alternative to cystectomy for patients with muscle-invasive bladder cancer.*

***Areas covered:*** *This review provides an overview of the value of trimodal therapy in the treatment of muscle-invasive bladder cancer with a specific focus on publications from main oncologic databases and a free-text hand searches during the past decade.*

***Summary:*** *Recent advances in TMT have made bladder preservation possible for MIBC patients seeking an alternative local therapy to cystectomy. With careful patient selection, TMT offers comparable survival outcomes to cystectomy, and improved quality of life as patients are able to successfully retain their bladder. Future trials are focusing on new techniques and novel therapeutics in patients with bladder cancer.*

***Keywords:*** *bladder cancer, trimodality therapy, muscle-invasive bladder cancer, bladder preservation, TURB*

**INTRODUCTION**

Bladder cancer accounts for nearly 170,000 deaths worldwide annually. Urothelial carcinoma of the bladder is the ninth most common cancer worldwide [27] and the fourth most common among men in the United States. In 2019, there was an estimated 80,470 new cases and 17,670 deaths due to bladder cancer in the US [49]. This is a disease that commonly affects the frail and elderly. The median age at diagnosis is 69 in men and 71 in women [43]. Among new cases approximately 75% are con­fined to the bladder mucosa (stage Ta, Tis, T1); 15% invade the muscularis propria (T2), extra­vesical adipose tissue (T3), and regional lymph nodes (N+), while the remainder present with de novo metastatic disease [6,1]. Localized muscle invasive bladder cancer (MIBC, stage≥T2) has a 5-year overall survival of 40–60% [29]. Bladder cancer carries a large soci­etal burden, with over 430,000 men and women diagnosed worldwide every year and has many associated risk factors, although many patients are diagnosed without any ap­parent exposures [48,14]. The most common and important risk factor remains cigarette smoking [6] and it is the most common expo­sure contributing to the increased incidence of bladder cancer in Western countries. In addi­tion, the extent of smoking may relate to the aggressiveness of bladder cancer, with heavy smokers more likely to have high-grade tumors and muscle-invasive disease [9]. In Uzbeki­stan, the incidence of bladder cancer in 2019 was 7 cases per 100 thousand population. The 563 patients registered with the diagnosis es­tablished for the first time in their life, and 44.2% of them were diagnosed with the sec­ond stage of the disease. [26]

**Muscle-Invasive Bladder Cancer (MIBC)** is a heterogeneous disease ranging from T2 tumours (which invade the muscularis propria) to T4 tumours (which invade the prostate, uterus, vagina, bowel or abdominal wall) and it represents approximately 25% of newly diagnosed cases of bladder cancer. Un­like nonmuscle-invasive bladder cancer, these tumours are biologically aggressive and 5-year survival is <15% in patients who do not receive treatment [36]. Radical cystectomy with pel­vic lymph node dissection (PLND) is the cur­rent gold-standard treatment for localized T2–T4 MIBC, but despite cystectomy with PLND, ~50% of patients die from metastatic disease[52] and approximately 50% of pa­tients ultimately develop disease at distant sites because of disseminated micrometasta­ses [51,54] and there remains high complica­tion rates with a 64% complication rate within 90 days and an approximately 2–13% 90-day mortality depending on case-volume and age [44,55]. Efforts to improve outcomes have fo­cused on the use of perioperative chemother­apy to eradicate micrometastatic disease [4]. However, the survival of patients with bladder cancer has not substantially changed over the past 30 years despite the introduction of these therapies [2]. In the past 10 years molecular profiling has resulted in the identification of promising novel biomarkers and therapeutic targets, which could improve outcomes for pa­tients with this disease [32]. Therefore, sys­temic therapy plays a key role in conjunction with local therapy to reduce rates of recurrence [28,34].

**TRIMODALITY THERAPY**

Available treatment which may reduce the complications and mortality associated with radical cystectomy and preserve the blad­der is bladder preservation trimodality therapy (BPTT). The three modalities of treatment for BPTT are maximal transurethral resection of the bladder tumor followed by concurrent chemotherapy and radiation. There are several historical successes using organ-sparing multi­modality therapies in lieu of radical surgery in­cluding lumpectomy and radiation for breast cancer [16], chemoradiation for larynx cancer [53], limb-sparing surgery and radiation for ex­tremity sarcomas [40], and chemoradiation for anal cancer [10]. In all, these treatments have been demonstrated equivalent OS and better organ function compared to radical surgery. In 1987, Shipley and colleagues [32] were the first to demonstrate the safety and feasibility of combining radiotherapy with cisplatin in pa­tients unsuitable for cystectomy. In 1993, Housset and colleagues [44] published the re­sults of a prospective study in 54 patients treated with transurethral resection of a blad­der tumour followed by chemotherapy (combi­nation 5-fluorouracil and cisplatin) and con­comitant bifractionated split-course radiother­apy. The investigators reported a disease-free survival of 62% at 3 years after treatment [39]. The largest series of bladder preservation ther­apy was reported by Rödel et al. who treated 415 patients with selective bladder preserva­tion over an 18-year period. The authors re­ported a complete response in 72% of patients (126 who received radiotherapy alone, 289 who received chemoradiotherapy) and a 10-year disease-specific survival of 42% with >80% of surviving patients preserving their bladder. Multiple other prospective and large, institutional studies have demonstrated good 5-year overall survival of 48–65%, with ~75% of surviving patients preserving their native bladders [12,24]. There are no randomized-controlled trials of BPTT compared to radical cystectomy. However, observational data con­tinues to support the use of BPTT as an ac­ceptable alternative for patients with MIBC who wish to preserve their bladder or are not candidates for cystectomy because it may re­sult in equivalent disease outcomes in select patients and offers the benefit of maintaining a functioning urinary system with subsequent improvements in quality of life. Here, we re­view and summarize the evidence for BPTT for MIBC with a focus on recent literature of patient selection, treatment approach, onco­logic and quality of life outcomes, and future directions.

**Patient Selection for Bladder Preser­vation and Exclusion criteria for trimodal therapy.** BPTT is generally offered for pa­tients who are unfit for surgery with nonmet­astatic MIBC or operable patients who wish to preserve the native bladder with clinically T2-T3N0M0 unifocal urothelial histology disease, without evidence of carcinoma in situ or hy­dronephrosis, where a complete transurethral resection is possible and there is good bladder function. The identification of advanced T-stage, multifocal disease, CIS, and hydro­nephrosis as risk factors for poor outcome has led to the exclusion of patients with these dis­ease features from many BPTT protocols, which have historically included patients with urothelial histology. For patients who wish to preserve the native bladder, careful selection based on clinical features is critical. Prospec­tive studies of BPTT, namely the Radiation Therapy Oncology Group (RTOG) 89-03 [51] and Cancer Research UK/01/004 BC2001 [54] trials, have included patients with up to T4a disease. However, as tumor stage increases, tu­mor responsiveness to chemotherapy and radi­ation decreases as demonstrated by a large ob­servational study that showed complete re­sponse rates of 86, 80, 66, and 43% for T1, T2, T3, and T4 tumors, respectively [28]. These re­sults have been confirmed in multiple studies and a large prospective analysis of long-term outcomes following BPTT from Massachu­setts General Hospital (MGH), which showed that patients with T3/T4 tumors, compared to T2 tumors, were independently associated with 1.5-fold and 1.8-fold worse OS and disease-specific survival (DSS), respectively, when controlling for other clinical and treatment-re­lated factors [45]. Because T3 tumors have ex­tended into perivesical fat and beyond and T4 tumors involve prostatic stroma, uterus, or vagina, as well as the poor response to chemo­therapy and radiation, they are typically man­aged surgically.

Different exclusion criteria for trimodal therapy for MIBC have been defined and in­clude: metastatic tumors, multifocal lesions, concomitant carcinoma in situ, incomplete or nonfeasible transurethral resection, aggressive histology, and hydronephrosis [4,40]. The presence of high-risk NMIBC (T1/Tis, with high grade/G3, or CIS) is associated with a higher risk of local relapse with decreased overall therapeutic success rates following rad­ical cystectomy [42]. Furthermore, patients with locally advanced urothelial carcinoma (T4) or carcinoma in situ benefits of radiother­apy as monotherapy have not been observed [40]. Hydronephrosis has been an exclusion criterion for Radiation Therapy Oncology Group (RTOG) protocols since 1993 because the response rate of patients without evidence of ureteral obstruction is ≥1.5 times higher than patients with hydronephrosis [29]. Blad­der-preserving therapy cannot be recom­mended when one or more of these exclusion criteria are present [20].

**Transurethral Resection of the Blad­der Tumor (TURB).** Patients undergoing complete transurethral resection show im­proved disease-specific and overall survival compared to those undergoing radical cystec­tomy [19,49]. TURB for NIMBC is also asso­ciated with lower rates of disease recurrence and with improved long-term oncologic out­comes for patients treated with trimodal ther­apy. Nevertheless, 30–70% of patients develop tumor recurrence after primary TURB [19,49,18]. Important factors that have a deci­sive influence on the outcome of the TURB procedure include the experience of the sur­geon, surgical technique used, tumor location and size, and documentation of complete tu­mor resection [37]. The results of a long-term follow-up study of 133 patients treated with TURB monotherapy and achieving complete radical transurethral resection of cT2 bladder cancer showed a 5- year overall survival of 73.3%, disease-specific survival of 81.9% and progression-free survival of 75.5% [3]. In a study of survival outcomes of 900 patients af­ter cystectomy with pelvic lymph node dissec­tion (without neoadjuvant chemotherapy), 20.1% of patients who had complete tran­surethral resection (pT0 pN0 at completion cystectomy), reached 10-year tumor-specific survival rates of up to 91.0% [37]. In another study, patients with an initial cT2-cT3 urothe­lial carcinomas of the bladder restaged as cT0-cT1 after TURB had a 10- year disease-spe­cific survival of 76% and were able to avoid radical cystectomy in 57% of cases [30].

In the MGH experience, patients under­going complete TURBT, followed by chemo­therapy and radiation, had a complete response of 79% compared to 57% for patients with in­complete TURBT (p < 0.001) []. This resulted in lower cystectomy rates for patients receiv­ing a complete TURBT compared to incom­plete TURBT (22 vs 42%, p < 0.001) and im­proved 10-year OS (39 vs 29%, p = 0.003) and DSS (63 vs 51%, p= 0.03) [3,30]. Maximal TURBT is an important consideration and the inability to achieve maximal TURBT has served as exclusion criteria for several BPTTseries [30,37]. Consequently, complete TURB of all visible tumors, including the de­trusor muscle, is essential for bladder-preser­vation therapy. It is the most important factor for oncologic control and success of trimodal therapy especially for those cases who would be considered overtreated by radical surgery. The use of intravesical therapies, such as Mi­tomycin C, Valrubicin, and bacillus Calmette Guerin (BCG) together with TURB has not yet been investigated.

**CHEMOTHERAPY**

If possible, systemic first-line therapy for advanced or metastatic disease should be cis­platin based. For almost 30 years, the combi­nation of methotrexate, vinblastine, doxorubi­cin, and cisplatin (MVAC) has been used suc­cessfully, either in normal dose intensity [53,46] or as dose compressed with granulo­cyte-colony stimulating factor (G-CSF) sup­port (dose-dense MVAC) [42]. The combina­tion of gemcitabine and cisplatin (GC) has been shown to be less toxic, with similar re­sponse rates and median longterm overall sur­vival [20,8]. Patients treated with MVAC were also found to have more severe grade 3–4 tox­icities compared to patients treated with car­boplatin [46]. Replacement of cisplatin by car­boplatin exhibits inferior efficacy, but also a lower incidence of nephrotoxicity (which is particularly beneficial in elderly and comorbid patients) [42]. The role of concurrent radiosen­sitizing chemotherapy has been well estab­lished in randomized trials comparing chemo­radiation compared to radiation alone. The two main trials, NCIC and BC2001, included con­current cisplatin monotherapy and 5-FU with mitomycin C, respectively. The National Can­cer Institute of Canada completed a prospec­tive randomized trial of radiation with or with­out concurrent cisplatin in 99 patients with T2-T4b MIBC [5]. After a median follow-up of 6.5 years, first recurrence in the pelvis was signif­icantly reduced in patients receiving cisplatin vs. without (29 vs.52%, p = 0.04). However, the addition of cisplatin did not improve OS or distant metastases but the trial was underpow­ered to detect these endpoints [5]. The BC2001 study was a randomized phase III trial with a partial 2 × 2 factorial design that enrolled 360 patients with muscle-invasive bladder cancer. Patients were randomized to radiation alone with or without fluorouracil (5-FU) and mito­mycin C. Notably, patients were also random­ized to receive whole-bladder radiation or ini­tial whole-bladder regimen with tumor boost. The primary endpoint was locoregional dis­ease-free survival and secondary endpoints were OS and toxicity. Patients receiving chemoradiation had a 2-year locoregional dis­ease-free survival of 67% compared to 54% in the radiation alone group and were 1.5 times more likely to be free of locoregional disease at a median follow-up of 5.8 years (HR 0.68, 95%CI 0.48–0.96, p = 0.03). Five-year OS was 48% in the chemoradiation group compared to 35% in the radiation alone group (HR 0.82, 95% CI 0.63–1.09, p = 0.16) with no statisti­cally significant difference in grade 3 or 4 ad­verse events (36 vs. 27.5%, p = 0.07) during treatment [42].

Chemotherapy alone is not an appropri­ate therapy for MIBC being treated for cure. The RTOG investigated the efficacy of induc­tion chemotherapy in TMT in serial phase II studies. About 123 patients with T2-4a, Nx MIBC were randomized to receive two cycles of neoadjuvant cisplatin, methotrexate, and vinblastine chemotherapy followed by 39,6 Gy pelvic irradiation with concurrent cisplatin (100 mg/m2) for two courses 3 weeks apart. In the other arm of the trial patients did not re­ceive MCV before concurrent cisplatin and ra­diation therapy. In result 5-year overall sur­vival rate was 49%; 48% in arm 1 and 49% in arm 2. Thirty-five percent of the patients had evidence of distant metastases at 5 years; 33% in arm 1 and 39% in arm 2. The 5-year survival rate with a functioning bladder was 38%, 36% in arm 1 and 40% in arm 2. None of these dif­ferences were statistically significant [46], so that induction chemotherapy has not been es­tablished [42].

**RADIATHERAPY**.

Radiatherapy has been used alone for several decades for patients who are inopera­ble. As previously discussed, when used alone, radiation has inferior outcomes when com­pared to chemoradiotherapy [20,23]. There is limited information on the outcomes of pa­tients who undergo TURBT and chemotherapy without radiation. In a small retrospective se­ries, which included 63 patients who were planning on undergoing radical cystectomy but declined surgery following TURBT and neo­adjuvant chemotherapy, 30% of patients who initially had a complete response, relapsed in the bladder and died [5]. In a phase II nonran­domized trial of bladder preservation with chemotherapy and TURBT, Solsona et al. re­ported on 75 highly select patients following TURBT and 3 cycles of chemotherapy. Ap­proximately one-third of patients had persis­tent or new invasive tumors in the bladder and the 5-year progression-free survival with pre­served bladder and 5-year cancer-specific sur­vival rate was 58.9 and 64.5%, respectively [41]. However, of patients who achieved a complete response, 56% of patients had recur­rence or progression, resulting in 72% of pa­tients receiving additional therapies and 45% requiring salvage cystectomy, a cystectomy rate similar to that seen in patients who un­dergo incomplete TURBT as part of BPTT.

Radiotherapy is an alternative to cystec­tomy for the treatment of MIBC, especially in patients for whom radical surgery is contrain­dicated (due to advanced age or poor medical condition) or who refuse radical cystectomy. There are two protocols for the implementation of radiotherapy in TMT. Standard radiation therapy regimen includes external-beam radio­therapy to the bladder and limited pelvic lymph nodes to a starting dose of 40–45 Gy, followed by cystoscopy (if necessary rebiopsy of resid­ual tumor tissue) and consolidation chemoradi­otherapy with additional 25 Gy or radiation in case of negative biopsy. The alternative radia­tion protocol includes full-dose chemoradia­tion to the whole bladder to 55–65 Gy followed by rebiopsy and surveillance in case of nega­tive rebiopsy. The standard fractionation used of both radiotherapy protocols is of 1.8–2 Gy/fraction with the total radiation dose to the bladder of 55–70 Gy and 45–50 Gy to the pel­vic lymph nodes. Compared to solitary radio­therapy, synchronous radiochemotherapy is associated with increased rates of local control and improved survival. Since the publication of two studies demonstrating significant im­provements in complete response, overall sur­vival, and local tumor control with cisplatin-based radiosensitizing chemotherapy followed by external beam radiotherapy [23], a com­bined cisplatin-based approach is recom­mended for patients with MIBC. The RTOG showed a complete response rate of 67% when patients with MIBC were treated with induc­tion chemotherapy [20]. Advances in radio­therapy techniques can reducelate grade 3 or higher gastrointestinal toxicity beyond the 7% reported in the ACRT arm using 3-dimensional conformal radiotherapy (3DCRT). Intensity modulated radiation therapy (IMRT) and im­age guidance allow radiation oncologists to de­liver doses of at least 50Gy to clinical target volumes within the pelvis, while avoiding ex­cessive doses to organs at risk [56].

**Surveillance after trimodal therapy.**

The aim of bladder-preserving therapy using the trimodal therapeutic approach for MIBC is to offer a quality of life advantage and avoid the potential morbidity or mortality of radical cystectomy without compromising on­cologic outcomes [52]. Taking the strict selec­tion criteria for bladder preserving therapy into account, the primary goal is complete tumor control. It is absolutely necessary that patients undergoing trimodal therapy agree to commit to lifelong surveillance with the option for rad­ical cystectomy in the case of treatment failure. Regular surveillance consists of physical and cystoscopic examinations including bladder biopsies, abdominal imaging by computed to­mography or magnetic resonance imaging and cytopathologic examination of urine samples [12,17]. One should also consider that the inci­dence of developing a urothelial malignancy of the upper urinary tract after primary urothelial carcinoma of the bladder is between 1 and 7%. Therefore, surveillance imaging of the upper tract is recommended every 1–2 years [37].

**Reasons for choosing a bladder-spar­ing treatment**

An important reason for choosing a blad­der-sparing therapy such as the trimodal thera­peutic approach is preservation of urinary bladder and sexual function. In urodynamic se­ries and quality of life questionnaires nearly 75% of patients showed normal bladder func­tion after bladder-sparing surgery. Distress from urinary symptoms was reported in <50% of patients (increased urinary urge 15%; uri­nary incontinence 19%) [13]. Efstathiou et al. [12] examined the prevalence of genitourinary or gastrointestinal pelvic toxicity in 157 pa­tients 2 years after bladder-preserving therapy and found no incidences of grade 4 toxicity in their cohort; 7% of patients showed grade 3 toxicity (urinary urgency and hematuria was reported by 5–7% of patients; sigmoid obstruc­tion or proctitis was reported in 1.9%). Also, there was no indication for salvage cystectomy secondary to pelvic toxicity. A small, nonad­justed, case-controlled series of 33 patients with biopsy-proven T2-T4a, N0, M0 urothelial bladder cancer showed similar overall and dis­ease-free survival rates with low toxicity when treated by chemoradiation compared to radical cystectomy alone. The 2- and 5-year overall survival rates after surgery alone (74.4% and 54.8%, respectively) were not significantly dif­ferent than after chemoradiation (70.2% and 56.6%; P = 0.8). Similarly, 2- and 5-year dis­ease-free survival rates after surgery alone were 67.8% and 63.2%, compared to 63% and 54.3% after chemoradiation (P = 0.89). Side effects were mild in both groups, with grade 3 toxicity seen in only two surgical and four ir­radiated patients [35]. A propensity score matched-analysis of 112 patients comparing trimodal therapy and radical cystectomy for patients with MIBC showed a 5-year disease specific survival rate of 73.2% for radical cys­tectomy and 76.6% for trimodal therapy [56]. In summary, no significant differences be­tween these therapeutic options were observed in these studies.

**CONCLUSION**

The treatment of MIBC is complex and requires a multidisciplinary collaboration among surgery, radiation, and medical oncol­ogy. Although perioperative chemotherapy followed by RC and pelvic lymph node dissec­tion has been established as a standard treat­ment of MIBC, many patients are either unfit for surgery or ineligible for cisplatin; thus, bladder preservation employing the combina­tion of maximal TURBT, sensitizing chemo­therapy, and radiation is now an established part of the therapeutic landscape in MIBC. The bladder cancer guidelines published by the American Urological Association, ASCO, the American Society for Radiation Oncology, and the Society of Urologic Oncology now incor­porate the selective use of these strategies. It may be the preferred management in elderly patients, those with too many other comorbid conditions to consider cystectomy, and in those who, after a good discussion of the alterna­tives, simply choose it. In the past couple of years, there has been a rapid evolution in blad­der cancer treatment with immuno-oncology, especially checkpoint inhibitors as single agents and/or in combination therapy in the first- and second-line metastatic bladder cancer settings. The multidisciplinary treatment of pa­tients with MIBC offers the best approach and yields the best outcomes for such patients. Fu­ture trials are focusing on novel techniques and agents; however, randomized data comparing radical cystectomy to BPTT are critically needed to further clarify optimal treatment and patient selection for patients with MIBC. Cor­rect and careful selection of patients is of high­est importance for safe and successful trimodal therapy.

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**HYGIENE, SANITARY AND EPIDEMIOLOGY**

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# TO THE PROBLEM OF FOOD ALLERGIES AND CROSS-ALLERGIC REACTIONS

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***ABSTRACT.*** *Food allergy is a global public health problem and needs to be addressed both at the level of individual countries and the global community. Clinical manifestations of the disease cover a wide range of diseases of the gastrointestinal tract, skin and respiratory tract, one of the manifestations of food allergy is oral allergy syndrome (OSA) associated with pollen sensitization. Homologous proteins found in plant foods can cause allergic reactions. To date, diet therapy is the main method of treatment. The main principle of the diet for food allergies is the elimination of allergens and allergen components that are specific to the region and individually for each patient. sick.*

***Key words:*** *food allergy, food allergens, syndrome of cross-reactivity, immunoglobulin E, fungi*

**К ПРОБЛЕМЕ ПИЩЕВОЙ АЛЛЕРГИИ И ПЕРЕКРЕСТНЫХ АЛЛЕРГИЧЕСКИХ РЕАКЦИЙ**

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*Пищевая аллергия является глобальной проблемой общественного здравоохранения и требует решения как на уровне отдельных стран, так и мирового сообщества. Клинические проявления заболевания охватывают широкий спектр заболеваний желудочно-кишечного тракта, кожи и дыхательных путей, одним из проявлений пищевой аллергии является оральный аллергический синдром (ОАС), связанный с сенсибилизацией к пыльце. Гомологичные белки, содержащиеся в растительных продуктах, могут вызывать аллергические реакции. На сегодняшний день диетотерапия является основным методом лечения. Основным принципом диеты при пищевой аллергии является устранение аллергенов и компонентов аллергенов, характерных для региона и индивидуально для каждого больного. больного.*

***Ключевые слова:*** *пищевая аллергия, пищевые аллергены, синдром перекрёстной аллергии, иммуноглобулин Е, грибки.*

**ОВҚАТ АЛЛЕРГИЯСИ ВА КЕСИШГАН АЛЛЕРГИК РЕАКЦИЯЛАР**

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*Ovqat allergiyasi sog‘liqni saqlash muammosi bo‘lib, uni alohida mamlakatlar darajasida ham, jahon hamjamiyatida ham hal qilish kerak. Kasallikning klinik ko‘rinishlari oshqozon-ichak trakti, teri va nafas olish yo‘llari kasalliklarining keng doirasini qamrab oladi, oziq-ovqat allergiyasining ko‘rinishlaridan biri gul changlarning sezgirligi bilan bog‘liq bo‘lgan oral allergik sindrom (OSA) sanaladi. O‘simlik tarkibidagi gomologik oqsillar allergik reaktsiyaga olib kelishi mumkin. Bugungi kunga kelib, parhez terapiyasi davolashning asosiy usuli hisoblanadi.*

***Kalit so‘zlar****: ovqat allergiyasi, ovqat allergenlari, kesishgan allergic sindrom, immunoglobulin E, zamburug‘lar.*

**INTRODUCTION**

Food allergy (FA) is a widespread dis­ease with prevalence ranging from 0.1% to 50% in the population. Clinical symptoms of FA cover a wide range of diseases of the skin, gastrointestinal tract and respiratory tract, among which one of the most common is OAS associated with sensitization to pollen. OAS is characterized by homology of thermolabile proteins of plant pollen, fresh fruits, and vege­tables.

An understanding of the characteristic clinical presentation can help with diagnosis. Diagnostic testing is highly sensitive and often identifies clinically irrelevant sensitization. Testing therefore must be selected and inter­preted in the context of the patient’s clinical history. Prognosis varies depending on the food allergen, and food allergy is a risk factor for other atopic diseases [3].

Pollen-food allergy syndrome (OAS) is a common disorder in which oral symp­toms, [pruritus](https://www.sciencedirect.com/topics/medicine-and-dentistry/pruritus) is a common disorder in which oral symptoms, itching of the throat and occa­sionally mild oral edema occur immediately upon the ingestion of certain foods, most com­monly raw fruits and vegetables, but also cer­tain nuts, e.g. hazelnuts and peanuts can trigger these symptoms. These complaints are due to specific IgE antibodies directed to aeroaller­gens that cross-react with certain food proteins. It is often useful to perform skin tests with fresh fruits and vegetables to confirm the diag­nosis, and component protein testing for hazel­nut (Cor a 9 and 14) and peanut (Ara h 8) will identify IgE to the birch pollen cross-reactive protein, Bet v 1 [1].

OAS is an allergic reaction in the oral cavity subsequent to the consumption of food, such as fruits, nuts, and vegetables, which oc­curs in adults who suffer from allergic rhinitis. Here we investigate the prevalence and trig­gers of birch pollen-related food allergy. It has been described under various names including «pollen-food allergy syndrome», «pollen-food syndrome» and «pollen-associated food al­lergy syndrome» [8,9,11].

OAS in adults probably represents the most common allergic reaction caused by food; and more than 60% of all FA are actually cross-reactions between food and inhaled aller­gens. Unlike other food allergies, OAS is a re­action limited to the oral mucosa, lips, tongue, and throat. OAS belongs to the allergy type I group, that is, allergic reactions mediated by immunoglobulin E (IgE). In susceptible pa­tients, the immune system produces IgE anti­bodies against the proteins of pollen which causes hay allergy. Pollen allergies are caused by repeated exposure to the pollen of some plants, which are usually pollinated by air and have such pollen quantities that inhalation of the pollen easily reaches the surface of the pul­monary alveoli. The proteins which are struc­turally similar to pollen are also found in food [8, 11, 16].

The OAS, more common in adults and adolescents, presents symptoms mainly affect­ing the oropharynx, and depends on a polysen­sitization to inhalant and food allergens. Rawapple, peanuts, almonds, hazelnuts, and other fruits of the Rosaceae family are com­monly implicated in patients with allergy to birch, while banana, kiwi, and melon are the eliciting foods in patients allergic to ambrosia, and melon and tomato are responsible for symptoms ingrass allergy patients. In this phe­notype, the IgE against pollen cross-reacts with homologous proteins in plant foods [10].

Clinical symptoms of FA cover a wide range of diseases of the skin, gastrointestinal tract and respiratory tract, among which one of the most common is OAS associated with sen­sitization to pollen. OAS is characterized by homology of thermolabile proteins of plant pollen, fresh fruits, and vegetables. Thus, 23-76% of patients with allergic rhinitis in differ­ent countries have a history of allergy symp­toms to at least one food, and more than half of patients with OAS suffer from intolerance to more than two types of plant foods. In Euro­pean countries, 70% of patients with sensitiza­tion to birch pollen have OAS associated with the consumption of fruits from the Rosaceae family, such as apples, peaches and pears. In this regard, the high prevalence of cross-reac­tivity to food of plant origin in patients with OAS dictates the need to develop innovative diagnostic methods and an algorithm for providing medical and preventive care.

Today allergy is a global public health problem and needs to be addressed both at the level of individual countries and the world community. It should be noted that the diag­nostic value of immunological tests in vitro di­agnostics is quite high and amounts to 87-90%, the information content of skin tests with food allergens is only 49% [15].

According to foreign authors, all aller­gens, including household, pollen, fungal, food allergens are divided into 130 protein families, depending on the functional properties and the similarity of the amino acid sequence. Cur­rently, more than 130 allergenic molecules are available for in vitro diagnostics of specific im­munoglobulin E (IgE) [14, 18].

The aim of the study was to study im­portant allergens characteristic of the country, identify hidden allergens and interpret the re­sults for the diagnosis of type I allergic reac­tions. It is known that the molecules of aller­gens differ depending on the biological func­tion as well as the structure of the protein fam­ilies. Some molecules have common epitopes (antigen binding sites), and IgE antibodies can bind to allergen molecules that have identical structures. Their origin can be different, the identification of allergens, with cross-reactiv­ity is of great importance and will give clini­cians information about the sensitization of the patient’s body to different allergens.

Having information about which mole­cules of allergens the patient is sensitized to, it is possible to predict the tendency to develop a systemic or local reaction and the persistence of clinical symptoms. The high prevalence of allergic diseases in our republic dictates the de­velopment of innovative diagnostic methods, which have a particular social and medical sig­nificance.

**Materials and methods.**

In the clinics of the republic, after a de­tailed analysis of the anamnesis, clinical symp­toms of patients with allergic diseases (Food Allergy, Allergic rhinitis, Bronchial asthma, Atopic dermatitis) at the age of 0-75 years (n=161) in order to study important allergens characteristic of the country, determine hidden allergens, for further choice of an appropriate diet, specific IgE was determined. antibodies to food, vegetable, professional (latex), house­hold and fungal allergens typical for our re­gion.

**Research results.**

All patients were examined by im­munoblotting test to determine the sensitivity to food allergens. Of the 161 patients, the con­trol group consisted of 74 (46%) patients who received negative results, the study group con­sisted of 87 patients. 1/3 of the patients were men, and 2/3 were women.

In 16 (9.9%), monosensitization was noted, they observed sIgE antibodies to one food allergen, while in 71 (44.1%) polysensiti­zation was observed, in which sensitivity was observed to two or more food allergens.

Of 161 adult patients (aged 0–75 years) who consulted an allergist, 10 (6.2%) had al­lergic reactions to chicken meat, 6 (3.7%) had FA to chicken meat and egg protein, 3 (1.9%) had no adverse reactions to food.

***Figure 1.* Allergic reactions to food allergens of animal origin**

Among the widespread allergens are fruits from the Rosaceae family: peaches, ap­ples, pears, apricots, strawberries and other trees with stone fruits. Allergy to apples in many patients is combined with allergy to birch pollen due to the identity of their aller­genic proteins, symptoms of damage to the oral cavity and pharynx are mainly observed, some­times it can be accompanied by allergic rhini­tis, bronchial asthma and gastrointestinal dis­orders. As the test results showed, the patients showed cross-reactions between Rosaceae group allergens: strawberries (14.3%), peaches (15.5%), apples (18.6%), apricots (19.3%).

***Figure 2.* Vet V 1 homology**

Allergic reactions were caused by аpiaceae: carrot (18,6%), utrianin (23%).

In addition, we detected IgE antibodies to peanuts (8.1%), walnuts (14.3%) and sunflower seeds (11.8%). These allergens characterized storage proteins.

***Figure 3.* Storage proteins**

Mushroom allergens include about 350 species of fungi that have been found to have allergic properties. Fungi are eukaryotic, sin­gle- or multicellular organisms that exist as saprophytes or parasites of plants and animals. The structure of fungal spores differs from pol­len spores, since the inhalation particles of fungi consist of living cells capable of growing and secreting allergens in vivo [4].

**Figure 3. Allergik reactions to fungi**

Families of fungi that are widespread in our climate are now known, which give cross-reactions and cause sensitization in patients with AD. Of all the data obtained in the repub­lic for positive results on RAST within the range of 1-6, the largest percentage of fungi was found for Mould fungi: Mucor mucedo, Rhizopus nigricans (14.1%). And also sIgE in­dices were detected for fungi: Penicillinum no­tatum (8.4%), Alternaria alternata (6.1%), Cladosporum herbarum, Aspergilus nigrus (5%), Candida albicans (4.1%). Sensitization to molds (Mucor mucedo, Rhizopus nigricans) was revealed in 14.9% of patients, which is characterized as a «latex-mushroom» syn­drome. The patients had clinical signs in the form of allergic rhinitis, conjunctivitis, contact dermatitis, urticaria, bronchial asthma.

**DISSCUSSION**

According to foreign authors, individu­als with allergies to Rosaceae, especially in the case of sensitization to PR-10 proteins (apple – Mal d 1, peach – Pru p 1) or profilins (peach – Pru p 4), more often have a local reaction, be­cause these proteins are destroyed by high tem­peratures and digestive enzymes. Sensitization to lipid transfer (LTP) proteins (peach – Pru p 3), characterized by clinical manifestations of a different nature (asymptomatic course, ana­phylaxis), as a rule, is a marker of anaphylaxis, which is provoked by other factors (physical activity, medication, wheat, etc.) [13].

In patients with pollen allergies, cross-reactivity between airborne allergens and food can cause FA. Symptoms can range from oral allergy syndrome to severe anaphylaxis. Clini­cal manifestations associated with IgE sensiti­zation to cross-reactive components of aeroal­lergens and food allergens have been charac­terized for many plant sources (pollen-food syndromes and associations, such as birch-ap­ple, cypress-peach and celery-mugwort-spice syndromes, and mugwort-peach, mugwort-chamomile, mugwort-mustard, ragweed-melon-banana, goosefoot-melon associations), fungal origin (Alternaria-spinach syndrome), and invertebrate, mammalian or avian origin (mite-shrimp, cat-pork, and bird-egg syn­dromes) [7].

Global climate changes have affected the amount of pollen, its allergenicity, and the du­ration of the dusting season. The use of new technologies in the food industry has radically changed the concept of the composition of a particular product. Animal products may con­tain plant allergens (for example, sausages may contain soy proteins, spices, etc.) [12].

Prior to OAS, sensitization to pollen con­taining proteins homologous to certain fruits and vegetables often develops. In such a case, a pollen sensitive patient may react to a food allergen without first contacting it. For exam­ple, sensitization to birch pollen can be com­bined with OАS after eating Rosaceae, espe­cially apples, peaches and cherries. In practice, cases are described about cross-reactions be­tween latex and banana, avocado, peach, kiwi, apricot, grapefruit, pineapple.

There is cross-reactivity among the car­rots, walnuts, peanuts, celery, apples, cherries, pears, buckwheat and pollen of birch; water­melon, banana, sunflower seeds, honey and chamomile with ragweed pollen. Watermelon, oranges, cherries, potatoes provide cross reac­tion with pollen of grasses. This is called «pol­len-fruit» syndrome. Celery can cause both oropharyngeal symptoms and system reactions like urticaria, asthma and anaphylactic shock.

Proteins of natural rubber latex and cer­tain fruits, vegetables (banana, kiwi, tomatoes, potatoes, carrot and watermelon) contain ho­mologous proteins, which can cause «latex-fruit» syndrome in sensitized patients.

The tactics of prescribing an elimination diet, which takes into account the exclusion of causally significant allergens from the patient’s diet, primarily depends on the timely diagnosis of causal allergens, the severity of clinical symptoms, and the patient’s age. Establishing the «culprit» - allergen and knowing its ability to cross-reactivity, resistance to heat treatment, as well as the correct determination of the ap­propriateness and duration of elimination of the allergen is an important task of the nutri­tionist-allergist.

In our country, the diagnosis of allergic diseases is difficult due to the lack of unified methodological approaches and standardized diagnostic methods to determine the mecha­nisms of allergy development. It should be noted that pseudo-allergic reactions are often clinically identical with allergic ones, but there are differences in their mechanisms. So, during pseudo-allergic reactions, specific antibodies are not formed, the reaction depends on the dose of the food product consumed and, unlike allergic reactions, is triggered at the first con­tact.

The same problem can arise with two well-known types of FA; wheat-dependant ex­ercise induced anaphylaxis and allergy to non-specific Lipid Transfer Protein allergens, both of which might only manifest when linked to a cofactor such as exercise. Many of these risk factors for food anaphylaxis have a common link; the public’s engagement with popular concepts of health and fitness. This includes the development of a food and exercise culture involving the promotion and marketing of foods for their health-giving properties i.e., meat substitutes, wheat substitutes, supple­ments and alternative, or “natural” remedies for common ailments. Some of these foods have been reported as the cause of severe aller­gic reactions, but because they are often viewed as benign unlikely causes of severe al­lergic reactions, could be considered to be hid­den allergens [17].

Allergenic proteins can contain linear or conformational epitopes or be heat stable or heat labile. Food allergens can be modified by food processing or are affected by specific methods of cooking, which can denature the protein or, conversely, render a protein more allergic through various known chemical path­ways [5].

Among the allergenic proteins of animal origin, the most clinically significant are ca­seins and lipocalins: the main milk allergens, a family of protease inhibitors, and calcium-binding proteins: parvalbumin, the dominant fish allergen [2].

As you know, milk and its processed products are widely used in the confectionery industry. Thermally stable milk protein casein enhances moisture retention in sweets and can­dies, in melted dairy products it improves crust color and strength, milk proteins serve as a whipped marshmallow base. Casein and ca­seinates are often used as salad dressings, fill­ers and spices in sausages, soups and stews, sauces, and ice cream [4]. Some food products (cow’s milk, peanut, egg) contain several epitopes, ensuring their allergenicity. In­creased sensitization to chicken eggs, espe­cially chicken protein, is a widespread problem that affects 1-2% of children worldwide. Mainly 4 egg allergens: ovomucoid, ovalbu­min, ovotransferrin and lysozyme cause hyper­sensitivity in patients [6].

Meat is a histamine liberator, rarely causes allergies, consumption in large quanti­ties can lead to the development of pseudo-al­lergic reactions, possibly due to the effect on mast cells by a non-specific mechanism. The antigenic composition of the meat of different animals differs, therefore, in patients with beef allergy, chicken, pork and lamb meat may not cause an allergy. Lamb is considered a mild food allergen, but shares common allergens with beef and sheep wool. The allergenic po­tential of meat is reduced by heating and by ex­posure to pepsin. This variant of sensitization in the determination of simultaneously specific IgE (sIgE) antibodies to egg and chicken meat in medicine is called the «bird-egg» syndrome.

Patients who are allergic to chicken meat may react to meat from other birds such as tur­key. Albumin of different animals has a high degree of structural similarity and in the pres­ence of hypersensitivity to albumin of one spe­cies of animal, patients may react to the epithe­lium and meat of other animals [4]. Haptens, which can combine with other dietary proteins, can also become complete allergens. When the immune barrier of the gastrointestinal tract is disturbed, a huge amount of antigens can enter the body. With the normal functioning of the gastrointestinal tract and the hepatobiliary sys­tem, sensitization to food supplied by the en­teral route does not develop [6].

When determining specific antibodies of the IgE class, the nature of aller­gic food intolerance is confirmed, which makes it possible to compile a list of products that are contraindicated for patients. Eating an appropriate diet is considered the primary way to truly prevent food allergies. In our republic, the main food allergens include cow's milk, eggs, cereals, gluten, peanuts, nuts, sesame seeds, buckwheat, celery. However, individual selection of the most likely food allergens for testing should be based on the patients’ specific diet.

Based on the above, the development of dietary rations, considering the climatic fea­tures of patients with food allergies, the com­ponent composition and allergenic properties of foods, with the help of modern methods of diagnosis becomes actual and perspective. Af­ter determining the cause-significant allergens, it is recommended that they be completely eliminated from the patient’s diet. It is neces­sary to avoid skin, inhalation ways of getting these allergens into the body of sensitized pa­tients. The diet should be strictly individual and it is necessary to make a diet, being guided by the anamnesis, clinical symptoms, age of the patient taking into account cross reactions between allergens.

Thus, we can conclude that the creation of dietary rations taking into account the cli­matic properties of the region, the individual characteristics of patients with food allergies, the component composition and allergenic properties of food products using modern diag­nostic methods is becoming relevant and promising. Attention should be paid to the fact that the diet should be strictly individual and when compiling it, it is necessary to be guided by the history, clinical symptoms, age of the patient, taking into account cross-allergic reac­tions between different groups of allergens. For all patients, there cannot be a single «standard» elimination diet.

**CONCLUSION**

Based on the above, the development of diet, considering the climatic features of pa­tients with food allergies, the component com­position and allergenic properties of food, with the help of modern methods of diagnosis be­come actual and perspective.

As a result of many years of research, we have recommended a list of «guilty» food products with high allergenic activity in our re­public, such as cow’s milk, eggs, cereals, glu­ten, peanuts, nuts, sesame seeds, buckwheat and celery. Due to the fact that these food prod­ucts have major allergenic components, the problem of managing latent allergens and their labeling is an urgent task of medicine.

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# STUDYING CHANGES IN THE HEALTH STATE OF SCHOOL CHILDREN ARISING FROM INCORRECT FITTING

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***Annotation.*** *Based on the analysis of scientific publications, the paper presents hygienic problems associated with the use of pupils furniture, the organization of the workplace, the correct seating of pupils is presented. Despite this, the harmful effects of poor posture on the health of pupils arising from improper organization of the workplace and the selection of school furniture are indicated.*

***Keywords:*** *health of schoolchildren, school furniture, correct seating of* *pupils*

**ИЗУЧЕНИЕ ИЗМЕНЕНИЙ СОСТОЯНИЯ ЗДОРОВЬЯ ШКОЛЬНИКОВ ВОЗНИКАЮЩИХ ПРИ НЕПРАВИЛЬНОЙ ПОСАДКЕ**

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***Аннотация.*** *На основе анализа научных публикаций в работе представлены гигиенические проблемы, связанные с использованием ученической мебели: представлена организация рабочего места, правильной посадки учащихся, указаны вредные воздействия неправильной рабочей позы на состояние здоровья учащихся, возникающее при неправильной организации рабочего места и подбора школьной мебели.*

***Ключевые слова:*** *здоровье школьников, школьная мебель, правильная посадка учащихся.*

**O‘QUVCHILARNI NOTO‘G‘RI O‘TQAZILGANDA ULARNING SALOMATLIGIDAGI O‘ZGARISHLARNI O‘RGANISH**

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***Annotatsiya.*** *Maqolada ilmiy adabiyotlarni tahlil qilish asosida maktab o‘quvchilari mebellaridan foydalanish bilan bog‘liq gigiyenik muammolar keltirilgan: ish joyini to‘g‘ri tashkil qilish, maktab o‘quvchilari to‘g‘ri o‘tqazish, ish joyini noto‘g‘ri tashkil etish va maktab mebellarini tanlash natijasida kelib chiqadigan maktab o‘quvchilari sog‘lig‘iga noto‘g‘ri ish holatining zararli ta’siri yoritilgan.*

***Kalit so‘zlar:*** *maktab o‘quvchilari salomatligi, maktab mebeli, o‘quvchilarni to‘g‘ri joylashtirish*

The health status of schoolchildren is largely determined by the conditions of their education and upbringing [4,5]. Over the past decade, a generally recognized fact is the dete­rioration in the health of children, especially of school age [2,9,4,13]. Research evidence have shown that among the main factors determin­ing the health of schoolchildren, 20% are the factors of the school environment [14].

Currently, the problem of creating opti­mal hygienic conditions for learning has ac­quired particular importance due to negative trends in the health of secondary school chil­dren, as well as due to changes that have oc­curred in school education in recent years [3,4]. Statistical data on the health indicators of pupils in general education schools in the Rus­sian Federation indicate an increase in the in­cidence of schoolchildren in all classes of dis­eases. The leading position among utrianing­dren is occupied by morphofunctional disor­ders of the musculoskeletal system, accounting for 46.5% [8, 11]. According to WHO, out of every 100 pupils at school, 50 inevitably ac­quire scoliosis, 30-40 – functional deviations in the cardiovascular system, 20-40 – myopia, 20-30 – suffer from neuropsychic dysfunctions. It turns out that there are practically no healthy children among those finishing school. Vari­ous posture disorders adversely affect to the functioning of the heart and lungs and other vi­tal organs, as well as distort the shape of the body and impair metabolism.

Violations and diseases of the utria­skeletal system of children further lead to the limitation of their life and social insufficiency, restrictions to entry into the occupation, con­traindications for military service, a negative impact on reproductive health and significantly reduce the quality of human life. Based on this, the problem of disorders of the musculoskele­tal system goes beyond the scope of only med­ical and acquires a high medical and social sig­nificance. The formation of the child’s muscu­loskeletal system is significantly influenced by children’s furniture [17, 16]. One of the im­portant reasons for the development of school pathology may be the prolonged presence of pupils in a static tense sitting position with their heads bowed low behind furniture that does not meet the hygienic requirements and physiological characteristics of the child’s body. The working posture of a pupil is one of the Important hygienic factors. One of the im­portant school factors influencing the for­mation of the musculoskeletal system, the veg­etative support of educational activities and maintaining the optimal level of mental perfor­mance of students is the organization of the workplace, which depends on the type of school furniture and options for its use.

The use of such furniture requires an er­gonomic and hygienic assessment of its design features.

Violations of the requirements of sani­tary rules for providing pupils with furniture corresponding to their body length in general educational schools are among the most fre­quently detected by specialists during control and supervision activities. Among the possible reasons noted are the lack of modern data on the distribution of educational sets in primary classes, low awareness of teachers about the effect of furniture on the health of utrianing­dren [12, 13]. The organization of the work­place, the student largely depends on the func­tional dimensions of school furniture, the val­ues of which are recorded in the relevant regu­latory documents (state standard and SanRandN). There are 5 groups of furniture, which have different seat heights above the floor, depending on the height of the student.

Posture is the position in which you hold your body while standing, sitting or lying down. It is formed in the process of growth, de­velopment and education.

Posture is an important indicator of health and harmonious physical development, since correct posture provides optimal condi­tions for the functioning of all organs and body systems. And severe postural disorders, on the contrary, significantly reduce the level of vital­ity and the degree of endurance of a person of any age, so the problem under consideration is relevant. The child’s posture is a dynamic ste­reotype and is unstable at preschool age, easily changing under the influence of positive or negative factors. Posture depends on the state of the neuromuscular apparatus and the human psyche. Weakness of the muscular corset, in­correct postures that the child takes while sit­ting, standing, lying, walking, playing, sleep­ing; congenital anomalies in the development of the ribs, chest, vertebrae, and lower extrem­ities cause the development of posture disor­ders [10].

Posture disorders – deviations of the spi­nal column from the anatomical norm in the anteroposterior or transverse planes are accom­panied by a change in the shape of the body, the relative position of the head, trunk, pelvis, arms and legs.

One of the main tasks of physical educa­tion at school should be to control not only the physical fitness of students, but also the basics of theoretical knowledge, the ability to inde­pendently use developmental, rehabilitation complexes and exercises, as well as the ability to maintain the correct working posture.

The educational process is associated with great mental and physical stress. Classes at a desk, drawing board, standing at a work­bench are associated with a certain, predomi­nantly static position of the body, causing ten­sion in the muscles of the back, neck, abdo­men, upper and lower extremities. The posture control system includes the central nervous system (corresponding segments of the spinal cord) and peripheral receptors in the muscles; posture control is carried out through the mus­cular apparatus, thanks to tremor – a slight trembling of the muscles. Postures with a slight slope are more beneficial from the point of view of statics and biomechanics – less fluctu­ation of the center of gravity. Additional motor units are involved in the work of large inclina­tions, the pulse quickens and the amplitude of breathing decreases. Furthermore, visual dis­turbances are possible, stagnation occurs in the bloodstream of the legs and small pelvis, com­pression of the vertebral discs occurs.

Static stress is a significant part of the to­tal school load of children. It occurs as a result of a forced immobile position of the body throughout most of the lesson. Pupils spend 4-6 hours at their desks in the lower grades and 8-10 hours in the upper grades. At the same time, static endurance in children and adoles­cents is low, body fatigue develops relatively quickly, which is associated with the age-re­lated characteristics of the motor analyzer. So, in first-graders after 5-7 minutes, and in sec­ond-graders after 9-10 minutes, contracted muscles pass from a state of tension to a state of relaxation. Externally, this is manifested in a change in posture, motor anxiety.

A large static load increases even more if the pupil sits behind furniture of an irregular design or that does not correspond to the length and proportions of the body. In these cases, the pupil also cannot maintain the correct working posture, as a result of which the posture is also disturbed. Reducing static stress can be achieved by maintaining the correct working posture. It depends on the appropriate selection of furniture.

Inconsistency of furniture with the growth of children, a change in the ratio be­tween the table and the chair can lead to une­ven loading and non-simultaneous fatigue of various muscle groups. There is a muscular asymmetry, which is one of the causes of vari­ous kinds of posture disorders. Incorrect land­ing causes faster fatigue of learners, a decrease in attention and performance. It contributes to the development of myopia as a result of non-observance of the optimal distance from the book to the eyes.

The correct position is one in which the scholar sits straight with a slight lean forward. So, the notebook and the book are at a distance of 25-35 cm. Noticeably, the hand passes freely between the chest and the table, how­ever, the back rests on the back of a chair or bench at the level of the waist. Thus, the legs are bent at the hip and knee joints at a right or obtuse angle and the entire foot rests on a stand or floor. Therefore, both hands lie freely on the table, shoulders are at the same height, parallel to the edge of the table. The organs of the chest and abdominal cavity are not constrained and breathing is free with proper fit. On this ac­count, the load on the musculoskeletal system is minimal and vision is not strained.

Proper fit is possible if the furniture matches the height and size of the child’s body. The height of the seat should correspond to the length of the lower leg together with the foot, with the addition of 1.5-2 cm to the height of the heel. It is necessary that the relief of the seat matches the shape of the thigh and but­tocks, and the seat itself has a slight tilt back. The seat depth is within 1/2—3/4 of the thigh length, with a lower seat depth, the support area decreases. Correspondingly, landing be­comes more tiring and less stable. At greater depths, the edge of the seat compresses the neurovascular bundle in the popliteal fossa.

Correct seating is ensured by the rational design of the table and the ratio between the table and the seat. The inclined position of the table top facilitates the accommodation work of the eyes when writing and reading. With a low table and a high chair, the pupil is forced to lean forward strongly and lean on the table. This leads to compression of the chest and ab­dominal organs. The right shoulder drops, which contributes to the appearance of left-sided scoliosis. With a high table and a low chair, the right shoulder is raised, the muscles of the shoulder girdle are tense. This contrib­utes to the formation of right-sided scoliosis.

Very often in children, scoliosis is also combined with kyphosis. And if scoliosis is a curvature in the lateral plane, then kyphosis is in the anterior. That is, in addition to the fact that the child develops an asymmetric posture, he also stoops.

Scoliosis is a sideways curvature of the spine that most often is diagnosed in adoles­cents. It can also be combined with kyphosis, though the conditions may be similar, they aren’t exactly the same. Scoliosis is a sideways curve of your spine, kyphosis is more of a for­ward rounding of the back, which leads to a hunchback or slouching posture.

Scoliosis refers to very common diseases of the musculoskeletal system of childhood and adolescence. Data on the prevalence of scoliosis are contradictory and range from 1% to 53% [1, 7].

In connection with the above data, the or­ganization of the workplace with the selection of school furniture has a huge impact on the health of schoolchildren.

In conclusion, we emphasize that in or­der to maintain the correct posture of school­children, it is necessary to select appropriate furniture for the growth of children, carry out the correct seating of pupils and monitor the maintenance of the correct working posture, and to reduce static stress, it is necessary to or­ganize physical education breaks.

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# DISEASES OF MODERN CITIES AND POPULATION

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***Abstract.*** *At present, the number of cities in the world is growing, and this process has been going on since the industrial revolution of the XVIII century. According to the calculations of the United Nations, 3,9 billion people live in urban centers. However, the rate of urbanization is not the same in different countries, and developed countries are already an indicator of cities, but it is expected that the urban population will increase in Asia and Africa in the next 30 years. Urbanization brings many challenges to the epidemiology of Health and Infectious Diseases on a global scale. New megapolises can become incubators of new epidemics, and Zoonoses can spread more quickly and threaten the whole world. Rational planning and epidemic control of cities can be powerful tools to improve health globally and reduce the burden of infectious diseases.*

***Key words:*** *cities, urbanization, diseases, infectious diseases caused by it.*

**ЗАМОНАВИЙ ШАҲАРЛАР ВА АҲОЛИ КАСАЛЛАНИШИ**

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***Аннотация.*** *Ҳозирги даврда дунёда шаҳарлар сони ортиб бормоқда ва бу жараён XVIII асрнинг саноат инқилобидан бери давом этмоқда. Бирлашган Миллатлар ташкилотининг ҳисоб-китобларига кўра, шаҳар марказларида 3,9 миллиард одам яшайди. Бироқ, шаҳарлашиш тезлиги турли давлатларда бир хилда эмас ва ривожланган мамлакатлар аллақачон шаҳарлардан иборатдир, аммо келгуси 30 йил ичида Осиё ва Африкада шаҳар аҳолисининг кўпайиши кутилмоқда. Урбанизация глобал миқёсда саломатлик ва юқумли касалликлар эпидемиологияси учун кўплаб муаммоларни келтириб чиқаради. Янги мегаполислар янги эпидемияларнинг инкубаторларига айланиши мумкин ва зоонозлар эса тезроқ тарқалиб, бутун дунёга таҳдид солиши мумкин. Шаҳарларни оқилона режалаштириш ва эпидемилогик назорат глобал миқёсда саломатликни яхшилаши ва юқумли касалликлар юкини камайтириш учун кучли воситалар бўлиши мумкин.*

***Калит сўзлар:*** *шаҳарлар, урбанизация, касалликлар, келиб чиқадиган юқумли касалликлар.*

**СОВРЕМЕННЫЕ ГОРОДА И ЗАБОЛЕВАЕМОСТЬ НАСЕЛЕНИЯ**

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***Аннотация.*** *В настоящее время количество городов в мире растет, и этот процесс идет со времен промышленной революции 18 века. По подсчетам ООН, в городских центрах проживает 3,9 миллиарда человек. Однако темпы урбанизации неодинаковы в разных странах, и развитые страны уже являются индикатором городов, но ожидается, что в ближайшие 30 лет городское население Азии и Африки увеличится. Урбанизация создает множество проблем для эпидемиологии здоровья и инфекционных заболеваний в глобальном масштабе. Новые мегаполисы могут стать инкубатором новых эпидемий, а зоонозы могут распространяться быстрее и угрожать всему миру. Рациональное планирование и борьба с эпидемиями в городах могут стать мощными инструментами для улучшения здоровья во всем мире и снижения бремени инфекционных заболеваний.*

***Ключевые слова:*** *города, урбанизация, болезни, вызываемые ею инфекционные заболевания.*

**MATERIALS AND METHODS**

Literature sources were carried out using Web of Science, Scopus, DBLP, Medline bib­liographic databases. In the selection of sources, attention was paid to experimental ar­ticles, literary reviews and the number of their instructions for the past year.

The industrial revolution of the XVIII century led to the emergence of large cities with great potential for the growth and devel­opment of Man and society. Living in the city can give us several advantages, namely the op­portunity to get a higher education, find a new highly profitable job, the reliability of quality medical services and the safety of social ser­vices, etc.

According to UN estimates, in 2020, 54% of the world’s population, that is, 3.9 bil­lion. people lived in urban centers [6]. The eco­nomic growth of countries is associated with urbanization, and countries with high per cap­ita incomes are among the most urbanized countries [8]. Financial and political power is often concentrated in cities, opportunities for quick actions are created when necessary.

When we say the process of utrian­tion, it is understood that in urban conditions people move and move from places. However, the meaning of the word” city “ does not have a universal definition. In different countries, many different interpretations can be seen, and they often do not give the same concept. There are different options: living in the capital, eco­nomic activity in the region, population or even population density. The non-availability of the universal definition makes it difficult to compare different countries and cities in terms of population health, as well as the burden and impact of infectious diseases [3].

In most of the studies conducted, the dif­ferences between urban and rural areas were examined and different urban conditions were not compared. In this particular environment, it can be difficult to get a full understanding from a global perspective and better under­stand the burden of infectious diseases. Cities in the world can be very diverse, and even very large differences can be observed in local dis­eases and health problems. Problems for one city can be completely unusual for another.

Urbanization is one of the leading secu­lar trends of the 21st century and has a signifi­cant impact on health. 55% of the world’s pop­ulation lives in cities, and this number is ex­pected to increase by 2050 to 68%. In the fu­ture, the growth of cities occurs mainly in de­veloping cities, in the world today there is an opportunity to focus on urbanization and other important development areas of cities to pro­tect and strengthen health. This is because the health and well-being of the citizens is proba­bly the most important aspect of the city’s at­tention. However, the majority of 4,2 billion people living in urban areas – half of humanity – suffer from inadequate housing and utriani­tation, poor sanitation and waste disposal, as well as contaminated air that does not comply with the WHO guidelines. In addition, other forms of pollution, such as noise, water and soil pollution, hot spots in the city, and lack of space for walking and biking and an active life­style, can also represent cities as an epidemic of non-communicable diseases, and an epicen­ter of climate change as a driving force.

The population of today’s and Future Cit­ies is suffering from infectious diseases such as HIV/AIDS, tuberculosis, pneumonia, dengue and diarrhea; non – communicable diseases such as cardiovascular disease, stroke, asthma and other respiratory diseases, cancer, diabetes and depression; violence and injuries, I­ing road traffic injuries. While cities can come up with a lot of challenges, they can open up opportunities to improve mobility in relation to health, clean environment and climate. Urban policy should be in line with such calls, be­cause health is essential to ensure a high in­come for living in cities, to create manpower for production, to create a viable and dynamic community, to develop mobility, to promote social interaction and to protect the needy groups of the population. Cities should also take advantage of the opportunity provided by a single body under the leadership of the mu­nicipal governorship, which has the authority to make decisions on urban planning, utriani­tation systems, procurement, energy, water and sanitation, as well as the network on Waste Management [3].

Strategic urban planning remains the key to creating a conducive environment for health from the point of view of planning, investing and integrating political decision making in matters of Health and fairness at the local level.

The structure and level of morbidity is the most important component of a compre­hensive assessment of the health of the popu­lation. Morbidity data are needed to base man­agement decisions at the federal and municipal level of health care. Based on the study of the current situation associated with the disease of the population and the forecast of its change in the future, it is possible to base the adequate planning of the network of medical organiza­tions and the need for other types of health re­sources.

According to the State Statistics Office of the Republic of Uzbekistan, the average an­nual population of the Republic is growing. In particular, the total population in 2021 year amounted to 34 131 615 people, which was more than 5 383 263 compared to 2011, the growth rate was 18.7%. The process of urban­ization and the change in the distribution of the population of the Republic between rural and urban areas are relevant for Uzbekistan. In ac­cordance with the agrarian orientation of the network structure of the economy, a significant predominance of the rural population was ob­served. In 2011, the share of the rural utria­tion was 57,3%. After organizational and ad­ministrative measures were taken to accelerate urbanization processes, consisting in the trans­formation of a number of rural population punks into urban settlements, the percentage of rural population decreased. However, in the following years, mainly due to the ongoing dif­ferences in fertility in the village and the city, as well as migration, the share of the urban population gradually decreased [1, 4, 7].

Thus, in 2021, the share of the utria­tion of the city of the Republic decreased slightly, but steadily, and in 2011 amounted to 57,3%, in 2021 50,8%.

Analyzing the dynamics of the disease in the last 10 years of the population of the Re­public of Uzbekistan, the General disease is characterized by a gradual increase in the inci­dence due to the increase in diseases of the ear and mucous membranes (VIII), respiratory or­gans (X), eyes and its formations (VII), the musculoskeletal system (XIII) and the circula­tory system (IX), digestive organs (XI), nerves (VI) and At the same time, the prevalence of diseases of the organs of blood and blood for­mation, mental disorders, congenital anoma­lies is decreasing. The level of primary mor­bidity in 2020 year reached 19367987.

In the second place in the composition of the common disease are diseases of blood and blood-forming organs, the average value of which was 15692,05 per 100 thousand inhabit­ants. At the same time, over the years, there was a uniform decrease in morbidity, and in 2021 year the rate of decline was 22,7%. The share of diseases of blood and blood-forming organs in the composition of the general popu­lation is 19% and is formed mainly on the ac­count of anemia (98%). The number of cases of primary infection with diseases of blood and blood-forming organs is 6365.33 for every 100 thousand inhabitants, with a total incidence of 40,6%.

The Incidence of diseases of the diges­tive system has increased by 20% over the past 5 years, taking the average 9817,74 over the 100 thousand inhabitants and the third place in the overall incidence structure; the share of the main disease is 64,5%. The main nosologies that make up this group of diseases are gastritis and duodenitis (11,9%), gall bladder and bili­ary tract diseases (4,7%), stomach and duode­nitis (3,6%). Diseases of the circulatory system take the fourth place in the overall morbidity structure of the population and are character­ized by high blood pressure and ischemic heart disease (40,3 and 18%, respectively). The growth rate (22,14%) of diseases of the circu­latory system is characterized by the greatest dynamic changes in the direction of growth. For five years, the average value of primary morbidity was 34.2%, while the number of 100 thousand population was 5935,62. The most common group of diseases is the IV class (dis­eases of the endocrine system, eating disor­ders, metabolic disorders), characterized by relatively the same dynamics over the past five years: the growth rates are increasing (up to 3.4%), but remain below the Republican indi­cators (up to 7.7%).

The ranking of the indicators of the gen­eral morbidity of the population by Regions made it possible to determine the regions that are leading by the level of the general morbid­ity of the Republic. Thus, the highest rate of general morbidity among the population of Tashkent (129231,12±63,2), Fergana region (98480±9,6), Karakalpakstan Republic (93959,36±3,1), Khorezm (91466,62 ± 6,6), Navoi (90031,96±14,3) regions was recorded.

Analysis of the structure of the General disease showed that among the inhabitants of Tashkent City this structure is mainly deter­mined by diseases of the respiratory system (23.8%), digestive system (18.6%), blood and blood-forming organs (8.6%), circulatory sys­tem (6.2%) and endocrine system (6.2%), to­gether they constitute 63.3% of the total struc­ture of the city population. The population of the city of Tashkent has the highest growth rate of the General disease compared to other re­gions – 40% [1, 4].

The health of the population, which is the most important economic and social potential of the country, is determined by the complex influence of socio-economic and biological factors and is assessed by a number of indica­tors such as demographic indicators, physical development, disease and disability. The issues of ensuring the quality of life of the population are of particular importance for Uzbekistan, a country with advanced economic develop­ment. The state reforms carried out have a pos­itive impact on the development of social in­frastructure in the regions of the Republic [2, 5, 8].

Timely and qualitative Diagnostics, which is one of the main tasks, along with the socio-economic development of the regions, the rapid development of primary medical care, the provision of medical care at the level of district medical associations and district medical diagnostic centers of rural medical units, is of particular importance for the re­gions of the Republic. Improvement of medical care in rural areas of the Republic is becoming increasingly relevant. Analysis of the disease of the population in the regions of the Republic allows to identify the shortcomings and needs for the improvement of the health system and to develop socio-hygienic and therapeutic-prophylactic measures aimed at improving the health of the population [5].

**CONCLUSION**

According to the State Statistics Office of the Republic of Uzbekistan, the average an­nual population of the Republic is growing. In 2021, the total population of the Republic was 34 131 615 people, which was more than 5 383 263 compared to 2011, the growth rate was 18.7%. In 2011-2021, the overall incidence of the population of the Republic of Uzbekistan increased by 7.7%. Among the population of the Republic, the leading pathology is Diseases of the respiratory system (23%), blood and blood-forming organs (19%), digestive organs (11.9%), circulatory system (7.2%) and endo­crine system diseases and disorders of utria­tion, metabolic diseases (7%), which account for 68% of all diseases of the 19 classes.

Urbanization is now a continuous pro­cess in the world, but the pace of this process is not the same. Developed countries, which are traditionally considered high-income coun­tries, have already been urbanized and there is a rapid recovery in developing countries. In­fectious diseases continue to have a huge im­pact on health globally, and urbanization is changing the characteristics of these diseases. Living conditions in urban areas are generally better than in rural areas; the improvement of housing conditions, sanitation, ventilation and social services play an important role in the im­provement of this living environment.

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# THE PROBLEM OF OVERWEIGHT IN CONSIDERATION OF COMORBIDITY AND NUTRITIONAL STATUS OF THE POPULATION ON THE BACKGROUND OF OBESITY

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***Annotation.*** *Overweight and obesity are caused by a multi-etiological, chronic and recurrent nature, which is currently a trend in the field of non-communicable diseases. In addition, the culprit of many deaths with COVID-19. In a word, this is a chronic pathology, the treatment of which must be carried out continuously and for life, it is especially important to maintain a reduced body weight. During the study period for preventive measures, the incidence of comorbidities in the population against the background of overweight and obesity, as well as nutritional status were studied.*

***Key words:*** *overweight, obesity, comorbidity, insulin resistance, diabetes mellitus, nutritional status.*

**ПРОБЛЕМА ИЗБЫТОЧНОГО ВЕСА С УЧЁТОМ КОМОРБИДНОСТИ И СТАТУСА ПИТАНИЯ НАСЕЛЕНИЯ НА ФОНЕ ОЖИРЕНИЯ**

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***Аннотация.*** *Избыточный вес и ожирение обусловлен мульти этиологическим, хроническим и рецидивирующим характером, который, на данный момент является трендом в области неинфекционных заболеваний. Кроме этого, виновник многих летальных исходов при COVID-19. Одним словом, это хроническая патология, лечение которого, должно проводиться непрерывно и пожизненно, особенно важным является удержание сниженного массы тела. В период исследования для профилактических мер, были изучены заболеваемость населения сопутствующими заболеваниями на фоне избыточного веса и ожирения, а также статус питания.*

***Ключевые слова:*** *избыточный вес,**ожирение, коморбидность, инсулинорезистентность, сахарный диабет, статус питания.*

**SEMIZLIK FONIDA AHOLINING OVQATLANISH HOLATI VA KOMORBIDLIKNI E’TIBORGA OLGAN HOLDA ORTIQCHA VAZN MUAMMOSI**

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***Annotatsiya.*** *Ortiqcha vazn va semizlik multi utriani, surunkali va takroriy xarakterga ega bo'lib, hozirgi vaqtda yuqumli bo'lmagan kasalliklar orasida muhim o’rin tutadi. Bundan tashqari, COVID-19 bilan ko'plab o'limlarning sababchisi hamdir. Bir so'z bilan aytganda, bu surunkali patologiya bo'lib, uni davolash doimiy va umrbod amalga oshirilishi muhim, ayniqsa kamaytirilgan tana vaznini doimiy ushlab turish juda muhim hisoblanadi. Profilaktik chora-tadbirlarni o'tkazish maqsadida ortiqcha vazn va semizlikga duchor bo’lgan aholi orasida surunkali kasalliklarni aniqlash va ovqatlanishni baholash borasida ilmiy o’rganish olib borildi.*

***Kalit so’zlar:*** *ortiqcha vazn, semizlik, komorbidlik, insulin qarshiligi, qandli diabet, ovqatlanishni baholash.*

**Relevance of the work.** According to the Ministry of Health of the Republic of Uz­bekistan in 2017, the nutritional status of the population of the Republic of Uzbekistan was studied. The results of the study showed that at the age of 18-64 years, two-thirds of the popu­lation (67%) daily consume insufficient amounts of vegetables and fruits; half of the population is overweight; obesity was detected in every fifth adult resident; 46% of the popu­lation has elevated blood cholesterol levels; 42% of men and 1.5% of women use tobacco; almost a third of the population has high blood pressure; 9% of the population has elevated fasting blood glucose; a fifth of the population aged 40-64 years has a ten-year risk of devel­oping cardiovascular disease; The average salt intake of the population is 14.9 grams per day, which is 3 times higher than recommended by the World Health Organization [3].

Prevention of obesity in children and ad­olescents has been improved in Uzbekistan [6]. However, scientific studies, according to a hy­gienic assessment, of the nutrition of the pop­ulation with obesity, taking into account comorbidity against the background of over­weight and obesity, have not been previously carried out.

**Purpose of the study.** Identification of the incidence of non-communicable diseases in overweight and obesity, as well as the study of the nutritional status among the population of different age categories to substantiate thera­peutic and preventive recommendations for healthy nutrition, within the polyclinics of Mirzo Ulugbek No. 5 and Almazar No. 16 dis­tricts of the city of Tashkent.

**Research materials.** The material of the study was the data of pathophysiological indi­cators of the functional state of the body from the outpatient charts of the examined, as well as the nutritional status taken by the question­naire method.

**Research methods.** When performing research work, hygienic (questionnaires, an­thropometry) and statistical research methods were used.

**Results and discussions.** Obesity today has a diverse etiology, which forces even deeper discussions in modern medicine. The prevalence of this pathology begins in infancy, continuing into the adult population[5,7,8]. There are many factors that lead to excessive accumulation of fat, and then to obesity. Fre­quently occurring factors are a violation of the intestinal microbiome and psycho-emotional disorders that entail other disorders of non-in­fectious origin [9].

Within the polyclinics of two districts of Mirzo Ulugbek No. 5 and Almazar No. 16 of the city of Tashkent, 1257 cases of overweight and obesity were registered.

***Table 1***

**The number of people examined by different age categories who are overweight and obese in polyclinics of two districts of the city of Tashkent (by sex)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Family clinics** | | | |
| **No 5** | | **No 16** | |
| N=544 | | N=714 | |
| Male | Female | Male | Female |
| 280 | 264 | 379 | 335 |
| **Total number of patients examined in two polyclinics** | | | |
| Male | | Female | |
| 659 | | 599 | |

Cases of overweight and obesity were detected at the age from 6 to12 and from 13 to 16 years (school age), from 17 to 21 years (adolescence), from 22 to 35 years (first adulthood), from 36 to 60 years (second mature age), from 61 to 74 years (old age), from 75 to 90 years and above (senile age).

***Table 2***

**The number of people examined by different age categories who are overweight and obese in polyclinics of the city of Tashkent (by age categories)**

|  |  |  |  |
| --- | --- | --- | --- |
| **FC** **No 5** | | **FC** **No 16** | |
| **Age** | **Case** | **Age** | **Case** |
| 6 – 12 years old | **-** | 6 – 12 years old | 24 |
| 13 – 16 years old | **-** | 13 – 16 years old | 45 |
| 17 – 21 years old | 5 | 17 – 21 years old | 55 |
| 22 – 35 years old | 61 | 22 – 35 years old | 125 |
| 36 – 60 years old | 270 | 36 – 60 years old | 228 |
| 61 – 74 years old | 143 | 61 – 74 years old | 113 |
| 75 – 90 years old and above | 65 | 75 – 90 years old and above | 125 |

Of the surveyed, 82 are schoolchildren, 57 are students, 673 are persons of mature age, of which 226 are working, 148 are working in a sedentary work, 78 are working in an active work, 50 are mothers, caring for a child, 446 are pensioners.

Excessive nutritional status is the con­sumption of large quantities of foods contain­ing fats and carbohydrates, a mismatch in the energy balance of food intake, a lack of vita­mins and minerals in meals, a lack of protein, an excess of salts, sugar, in a word, an unbal­anced diet [1]. In infants, this is fatty mother’s milk, the adapted diet does not correspond to the age of the child, age norms are not observed when introducing complementary foods, adult food from an early age, which disrupt the me­tabolism in the child’s body [2].

***Picture 1.* The frequency of overweight and obesity among the population of different age categories in two districts of the city of Tashkent (in absolute numbers).**

The BMI data show that, in the two re­gions surveyed, there is no sufficient sleep or an excess of sleep, a violation of the sensitivity of sleep, an unhealthy diet, a lack of walks in the fresh air, a lack of interest in sports, as well as a lack of cultural, spiritual, mental rest, a lack of morning physical activity, stabbing, swimming. In total, 220 people are physically active outdoors from time to time, 181 people go in for sports.

According to the forecasts of the World Health Organization (WHO), since the middle of the 20th century, non-communicable dis­eases have begun to spread on a large scale, which already today are the cause of 60% of all deaths in the world. [2]. In Uzbekistan, these figures account for 78% of all deaths. Accord­ing to the Ministry of Health of the Republic of Uzbekistan, together with the World Health Organization among the population of the Re­public of Uzbekistan, in 2017, mortality rates among women and men were studied. The first place was occupied by such diseases as: circu­latory system disorders (69%), coronary heart disease, arterial hypertension and their compli­cations (myocardial infarction, cerebral stroke) (8%), malignant neoplasms (8%), diabetes mellitus (3%), chronic respiratory diseases (3%) [3].

***Picture 2.* Identified diseases of non-infectious origin in the population of different age categories with overweight and obesity.**

To determine the physiological state, data were taken from outpatient charts of over­weight and obese subjects, recorded by narrow specialists of two polyclinics of Mirzo Ulug­bek No. 5 and Almazar No. 16 districts of the city of Tashkent, a number of diseases of non-infectious origin were identified. On the part of the cardiovascular system: hypertension, vege­tovascular dystonia, coronary heart disease, angina pectoris and acute cerebrovascular ac­cident – 62%; from the respiratory system: chronic obstructive bronchitis – 4%; endocrine diseases: type 2 diabetes, total strumectomy; neurological diseases: myasthenia gravis, Parkinson’s disease, convulsive syndrome – 2%; diseases of the musculoskeletal system: arthrosis, deforming osteoarthritis, osteoporo­sis, osteochondrosis, rheumatoid arthritis – 6%; diseases of the digestive system: gastritis, pan­creatitis, reactive hepatitis, cholecystitis, chronic gastritis, chronic hepatitis, chronic hepatocholecystitis, chronic cholecystitis, gas­tric ulcer – 4%; diseases of the urinary system: urolithiasis, pyelonephritis, prostatitis, cystitis – 2%; oncological diseases: cancer of the fe­male organs, bladder cancer, breast cancer, bowel cancer – 3%; other pathologies: myopia, viral hepatitis C – 13%.

The reason for all this is poor nutrition, which begins with the period of pregnancy, which leads to the birth of children with pa­thologies, with metabolic changes. Malnutri­tion in young children, characterized by an in­crease in body weight, a decrease in immunity, and the appearance of a series of pathologies on the part of organs and systems, this indi­cates the need to form an optimal approach to the nutrition of a child in the family, and, above all, where there is a family history of obesity, atherosclerosis and arterial hypertension. Opti­mization of nutrition in childhood helps to con­solidate eating habits in adulthood [10].

***Picture 4.* The number of different drinks consumed among the overweight and obese population.**

In the study of the nutritional status among the population with overweight and obesity, registered in the polyclinics of two districts of Mirzo Ulugbek No. 5 and Almazar No. 16 of the city of Tashkent, the nature of nutrition was studied by a questionnaire method, in which all food consumed was rec­orded in order to determine the quality of nu­trition, a set of products of the daily diet, its multiplicity, intervals between meals, daily calorie content, as well as heat treatment.

The survey was conducted among over­weight and obese school-aged, middle-aged and elderly people, data on nutritional status were collected through a questionnaire and the following questions were asked to determine the list of foods used in the diet, nutrient com­position, as well as the mode and intake of food: confectionery, sauces (tomato, mayon­naise), an excess of dairy products, frequent consumption of coffee and tea, colored car­bonated drinks, packaging juices, an excess of fatty, carbohydrate-containing foods (fast food), excessive consumption of salt, sugar, smoked meats, chocolate and other sweets. In addition: fruits, berries, vegetables, greens, legumes, cereals, meat products, offal, sea­food, fish, eggs, dairy products, nuts.

***Picture 5.* The use of meat products among the population of different age categories with overweight and obesity.**

***Picture-6.* Products consumed by the population of different age categories with overweight and obesity.**

**Conclusion.** The revealed data will fur­ther help general practitioners to eliminate the gaps in people with obesity of different age categories, taking into account the risks of pa­thology and nutrition of the population. Elimi­nating the problem of excess weight, timely implementation of preventive measures to pro­tect public health, maintain a healthy lifestyle, maintain healthy nutrition and physical activity among the population of the Republic of Uz­bekistan is one of the priority areas of medi­cine.

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# STUDY AND ANALYSIS OF THE ANTHROPOMETRIC INDICATORS OF THE COVID-19 PATIENTS

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***Abstract.*** *The average age of patients was 51.6 ± 0.82 (men – 51.6 ± 2.70, women – 54.7 ± 1.48), body mass index (BMI) was 27.3 ± 3.926. It should be noted that the prevalence and severity of the disease were higher in overweight patients.*

*The study analyzed the incidence of the disease by dividing into age groups of 938 patients (375 males and 563 females) at the 1st and 2nd Infectious Diseases Hospitals in Zangiota district of Tashkent region; 1st group included patients until 18 years of age and it consisted 4.1%, 2nd group included patients from 18 up to 29 years of age, it consisted 5.7%, 3rd group was 12.3% of those aged 30-39, the highest rate was 40-59 in group no.4 – 39.7% , and lastly group no.5 – patients older than 60 years of age was 37.9%.*

***Key words:*** *Covid-19, age groups, anthropometric indicators.*

Today, along with various infectious dis­eases, Covid-19 disease is showing its compli­cations among different social groups of the population. These complications include high blood pressure, exacerbation of various so­matic diseases, shortness of breath and fatigue. Covid-19, which is considered to be a disease of the respiratory system, is distinguished by its infectious nature, disease incidence rates and post-disease complications.

Numerous studies have shown that 40–50% of hospitalized patients with COVID-19 are obese and 30% are overweight [1,2,4]. Overweight and obesity are the leading risk factors for death in people over the age of 65 [2]. Overweight or obesity is primarily due to an imbalance of adipocytokines (cytokines re­leased from adipose tissue) that respond to the immune system’s reaction, which will cause an inflammation even if at lower levels [3].

**Aim of the research:** Hygienic assess­ment and analysis of some obtained results from the anthropometric indicators of the Covid-19 patients.

**Material and methods of the research:** Patients from the Zangiota District Infectious Diseases Hospital No. 1 and No. 2 in 2020-2021with Covid-19; measuring their anthropo­metric parameters and a deliberately developed questionnaire to study the disease were the taken materials for the study, and the obtained results were processed using the personal com­puter software package “Statistics for Win­dows 7.0”.

**Results:** The study was provided with 938 patients (375 males and 563 females) at the 1st and 2nd Infectious Diseases Hospitals in Zangiota district of Tashkent region.

We have divided the population that had Covid-19 into following groups, i.e. 5 groups. The group distribution by age is provided in the table 1.

***1-Table***

**Distribution of patients with Covid-19 by gender and age group (%)**

|  |  |  |  |
| --- | --- | --- | --- |
| Age, year | Men, n=375 | Women, n=563 | Overall, n=938 |
| >18 | 6(3,4) | 25 (4,56) | 18(4,1) |
| 18-29 | 9 (5,14) | 16 (6,08) | 25 (5,7) |
| 30-39 | 29 (16,57) | 25 (9,5) | 54(12,3) |
| 40-59 | 71 (40,57) | 103 (39,16) | 174 (39,7) |
| 60< | 59(33,7) | 107(40,68) | 166(37,9) |

As a result, the lowest incidence rate was in group no.1 – 3.4% of men and 4.45% of women; in group 2 – 5.14% of men and 6.08% of women; in group 3 – 16 men and 57%, women 9.5%; 4th group – men of the 40.57% and women 39.16%; 5th group – men of the 33.7% and women 40.68%. We can see that the highest indicator was 39.7% of those aged 40-59 belonging to group 4.

The anthropometric indicators of patients with Covid-19 are given in Table 2.

***2-Table***

**Anthropometric parameters of patients with Covid-19**

|  |  |
| --- | --- |
| **Anthropometric indicators** | **Statistics** |
| Age | 51,6±0,82 |
| Height (cm) | 164±1,38 |
| Weight (kg) | 77,1±1,37 |
| BMI (kg/m2) | 27,3±3,926 |

The data collected during the study showed that the average age of patients with Covid-19 was 51.6 ± 0.82. Body mass index (BMI) was found to be 27.3 ± 3,926.

The average age of patients was 51.6 ± 0.82 (men – 51.6 ± 2.70, women – 54.7 ± 1.48), the height – 164 ± 1.38 cm., the weight was 77.1 ± 1.37 kg, and body mass index (BMI) was 27.3 ± 3.926.

In conclusion, it is noticeable that the analysis of patients with Covid-19 shows that the disease manifested more severely in adults, in overweight patients and in patients with high body mass index.

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# ASSESSMENT OF ACTUAL NUTRITION OF PATIENTS WITH CHRONIC DISEASE OF KIDNEYS

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***Annotation****. When studying the actual nutrition of patients with chronic disease of kidney (CDK), it was found that the actual nutrition of 105 patients with CDK is scarce in terms of consumption of meat products (beef, poultry, fish), dairy products (milk, sour cream, curd), potatoes, vegetables, fruits, etc., especially in winter and spring time. At the same time consumption of legumes and flour products is overestimated, which does not meet dietary requirements of nutrition and can cause protein-energy insufficiency and increase the number of complications of the main disease.*

***Keywords****: patients with chronic kidney of disease, actual nutrition, food, average daily norms, dietary nutrition.*

**ОЦЕНКА ФАКТИЧЕСКОГО ПИТАНИЯ БОЛЬНЫХ С ХРОНИЧЕСКОЙ БОЛЕЗНЬЮ ПОЧЕК**

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***Аннотация****. При изучении фактического питания больных с хронической болезнью почек (ХБП) установлено, что фактическое питание 105 больных с ХБП носит дефицитный характер по потреблению мясных продуктов (говядина, птица, рыба), молочных продуктов (молоко, сметана, творог), картофеля, овощей, фруктов и др., особенно в зимне-весенний период. При этом потребления бобовых и мучных продуктов завышено, что не соответствует диетическим требованиям питания и может быть причиной белково-энергетической недостаточности и увеличить количество осложнений основного заболевания.*

***Ключевые слова:*** *больные с хронической болезнью почек, фактическое питание, продукты питания, среднесуточные нормы, диетическое питание.*

**СУРУНКАЛИ БУЙРАК КАСАЛЛИГИ БЎЛГАН БЕМОРЛАР ОВҚАТЛАНИШИНИ БАҲОЛАШ**

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***Аннотация****. Сурункали буйрак касаллиги (CКД) билан касалланган беморларнинг ҳақиқий овқатланишини ўрганилганда, CКД билан касалланган 105 беморнинг овқат рационида, айниқса қиш-баҳор даврида гўшт маҳсулотлари (мол гўшти, парранда гўшти, балиқ), сут маҳсулотлари (сут, сметана, творог), картошка, сабзавот, меваларни истеъмоли меъёрдан кам эканлиги аниқланди. Шу билан бирга, дуккакли utri маҳсулотларини истеъмоли ортиқча эканлиги, бу парҳез овқатланиш талабларига жавоб бермайди, бу эса оқсил-қувват танқислигига олиб келиши ва асосий касалликнинг асоратларини оғирлаштириши мумкин.*

***Калит сўзлар****: сурункали буйрак касаллиги бўлган беморлар, ҳақиқий овқатланиш, озиқ-овқат, ўртача кунлик меъёрлар, парҳез овқатланиш.*

Introduction. The issues of therapeutic nutrition in patients with chronic kidneys dis-ease (CKD) are traditionally given serious at­tention [1, 2], but they acquire special im­portance at the stage of hemodialysis treat­ment. The main problems in the nutrition of di­alysis patients are compliance with the neces­sary caloric intake and sufficient protein con­tent in the diet. The nu-tritional status of dialy­sis patients is one of the factors determining the long–term survival and effectiveness of treatment [3].

Non-compliance with dietary require­ments worsens the quality of hemodialysis treatment, increases the number of complica­tions. Insufficient intake of nutrient food, un­balanced diet contributes to the development of protein-energy deficiency in patients [4].

The quality of therapeutic nutrition in kidney transplant recipients is an important factor in the prognosis of effective treatment, both in terms of reducing the number of com­plications and reducing mortality [5]. Diet can be used to prevent many complications of transplantation, although the exact require­ments for therapeutic nutrition in the postoper­ative period in kidney transplantation have not been determined yet.

The main requirements for therapeutic nutrition in kidney diseases are a variety of di­etary intake, adequacy of the macro- and mi­cronutrient composition and energy value of the diet, a differentiated approach to diet ther­apy depending on the nature, severity of kid­ney disease, the presence of complications and concomitant diseases. In this regard, the study of actual nutrition in patients with chronic kid­ney disease is an urgent problem.

The aim of the study is to study the actual nutrition in patients with CKD.

Materials and research methods. Actual nutrition was studied in 105 patients with CKD, aged 18 to 76 years. The studies were carried out at the Department of Hygiene for Children, Adolescents and Nutrition of the Tashkent medical academy, as well as at the City Nephrological Hospital in Tashkent. The nutritional status of patients was studied using a questionnaire card developed by employees of the Department of Hygiene for Children, Adolescents and Nutrition together with em­ployees of the city nephrological hospital in Tashkent. To identify nutritional features, the examined male patients were divided into age groups of 18-59 and 60 years and older, women -18-54 and 55 years and older. The av­erage age is 53.8±1.31 years (for women – 54.7±1.48 years; for men – 51.6±2.70 years).

The assessment of the nature of the nu­trition of patients was carried out by analyzing the frequency of food consumption. In order to clarify the type of product and the size of the portions eaten, food models were used, which are dummies of pre-weighed and ready-to-eat food products, special measured tableware and appliances (plates, cups, glasses, spoons, etc.) with a known volume, in packaging and with labels available for sale of food products, which indicate the name, weight and fat con­tent of the product. The material was collected in expeditionary conditions 2 times a year (winter-spring and summer-autumn periods) with registration in individual sheets of the products actually eaten by the sick people within 6 days. The content of basic nutrients and energy was calculated according to the ta­bles of the chemical composition of food prod­ucts [7,8]. The results obtained were compared with the average daily rational norms of food consumption for the population of the Repub­lic of Uzbekistan [6].

Research results. The analysis of the pro­vision of patients with CKD with basic food­stuffs in the winter-spring period showed that the actual nutrition is deficient in some prod­ucts, which is due to the characteristic irra­tional hierarchy of food sets. According to the questionnaire survey, the diets are character­ized by the predominance of flour-cereals and legumes against the background of non-com­pliance with nutrition standards for fresh veg­etables and fruits.

In the examined (men from 18 to 59 years, women from 18 to 55 years) in the win­ter-spring period, the consumption of legumes (peas, mash, beans) is higher than normal by 24.4% in men, 25.9% in women, cereals by 26.0% in men, 31.0% in women, cheese and cheese by 14.0% in men, by 20.0% in women. Cooked foods in the diets of flour products are overestimated by 22.0% in men, by 32.0% in women. Of meat products, beef meat is 23.1% lower than normal for men, 29.0% for women, poultry meat is 47.0% for women, 19.0% for men. The consumption of fish products for men is 72.4% lower than normal, for women – 72.0%.

Milk, sour cream, butter, and cottage cheese were in obvious short supply among dairy products. The deficit ranged from 50.3 to 12.0% in men and from 51.5 to 18.0% in women. The deficiency of vegetable fat (mainly cotton) turned out to be relatively small: 15.2% for men, 16.4% lower than nor­mal for women. A clear lack (almost 2 times less than the norm) of consumption of vegeta­bles, melons, fruits and berries was revealed in both men and women, the deficit ranged from 53.1 to 72.7% in men, from 47.8 to 76.7% in women.

Men consumed potatoes less than the norm by 11.8%, women – by 18.5%. There was also a low consumption of eggs: 16.7% less than the norm in men, 15.0% – in women. The patients consumed little sugar: the deficit in men was 76.2%, in women – 74.6%.

***table***

**Consumption of basic food products by patients (winter-spring period / summer-autumn period)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **№** | **Products** | **Men 18-59 years old (20)** | | | **Women 18-54 years old (26)** | | | **Men 60< years (11)** | | | **Women 55< years (48)** | | |
| **norm.** | **fact.** | **%** | **norm.** | **fact.** | **%** | **norm.** | **fact.** | **%** | **norm.** | **fact.** | **%** |
| 1 | Legumes | 9 | 11,2  6,9 | 124,4  76,7 | 8,5 | 10,7  7,2 | 125,9  84,7 | 7,7 | 9,2  6,5 | 119,5  84,4 | 7 | 8,1  5,7 | 115,7  81,4 |
| 2 | Wheat flour | 5 | 6,1  4,1 | 122,0  82,0 | 5 | 5,2  4,5 | 104,0  90,0 | 4 | 3,7  3,6 | 92,5  90,0 | 4 | 3,8  3,5 | 95,0  87,5 |
| 3 | Other flour | 2 | 1,3  1,1 | 65,0  55,0 | 5 | 2,8  2,5 | 56,0  50,0 | 3 | 1,7  1,5 | 56,7  50,0 | 5 | 2,9  2,5 | 58,0  50,0 |
| 4 | Rice | 20 | 22,3  15,5 | 111,5  77,5 | 15 | 16,8  12,1 | 112,0  80,7 | 16 | 15,1  13,5 | 94,4  84,4 | 12 | 11,5  9,8 | 95,8  81,7 |
| 5 | Cereals (without rice) | 10 | 12,6  7,6 | 126,0  76,0 | 10 | 13,1  6,9 | 131,0  69,0 | 8 | 9,2  6,2 | 115,0  77,5 | 8 | 9,3  6,3 | 116,3  78,8 |
| 6 | Wheat bread. (Total) | 445 | 372,6  304,5 | 83,7  68,4 | 385 | 325,6  255,3 | 84,6  66,3 | 370 | 289,8  235,3 | 78,3  63,6 | 330 | 271,4  222,1 | 82,2  67,3 |
| 7 | Pasta | 20 | 15,9  12,4 | 79,5  62,0 | 15 | 12,1  9,7 | 80,7  64,7 | 16 | 12,4  9,8 | 77,5  61,3 | 15 | 11,5  10,1 | 76,7  67,3 |
| 8 | Potato | 180 | 158,7  118,7 | 88,2  65,9 | 155 | 126,3  98,6 | 81,5  63,6 | 140 | 121,4  92,3 | 86,7  65,9 | 120 | 101,4  75,8 | 84,5  63,2 |
| 9 | Cabbage | 55 | 15,0  31,6 | 27,3  57,5 | 40 | 11,3  23,7 | 28,3  59,3 | 44 | 14,1  27,2 | 32,0  61,8 | 32 | 10,5  21,3 | 32,8  66,6 |
| 11 | Cucumbers and tomatoes | 155 | 46,1  115,8 | 29,7  74,7 | 112 | 33,8  89,3 | 30,2  79,7 | 124 | 37,7  85,5 | 30,4  69,0 | 89 | 33,9  60,4 | 38,1  67,9 |
| 12 | Beets and carrots | 95 | 39,4  42,6 | 41,5  44,8 | 65 | 31,7  35,4 | 48,8  54,5 | 75 | 33,5  38,4 | 44,7  51,2 | 52 | 24,1  27,6 | 46,3  53,1 |
| 13 | Other vegetables | 155 | 72,4  126,8 | 46,7  81,8 | 112 | 53,9  95,4 | 48,1  85,2 | 124 | 65,5  103,4 | 52,8  83,4 | 89 | 42,8  72,8 | 48,1  81,8 |
| 14 | Melons | 40 | 15,0  43,1 | 37,5  107,8 | 55 | 12,8  45,8 | 23,3  83,3 | 32 | 10,1  35,3 | 31,6  110,3 | 40 | 12,1  33,4 | 30,3  83,5 |
| 15 | Fresh fruits and berries | 150 | 70,3  125,4 | 46,9  83,6 | 100 | 52,2  112,3 | 52,2  112,3 | 114 | 55,5  98,7 | 48,7  86,6 | 150 | 70,6  110,4 | 47,1  73,6 |
| 16 | Dried | 18 | 22,3  12,6 | 123,9  70,0 | 40 | 29,8  15,4 | 74,5  38,5 | 24 | 15,1  13,3 | 62,9  55,4 | 32 | 22,3  15,2 | 69,7  47,5 |
| 17 | Citrus | 10 | 12,6  6,6 | 126,0  66,0 | 10 | 11,9  5,9 | 119,0  59,0 | 8 | 10,5  5,7 | 131,3  71,3 | 8 | 11,0  6,1 | 137,5  76,3 |
| 18 | Meat beef | 65 | 50,0  41,5 | 76,9  63,8 | 50 | 35,5  29,8 | 71,0  59,6 | 45 | 32,7  28,6 | 72,7  63,6 | 50 | 36,8  32,3 | 73,6  64,6 |
| 19 | Lamb meat | 20 | 9,5  8,6 | 47,5  43,0 | 20 | 8,7  7,5 | 43,5  37,5 | 15 | 6,3  5,2 | 42,0  34,7 | 20 | 6,6  5,5 | 33,0  27,5 |
| 20 | Meat poultry | 20 | 10,6  12,6 | 53,0  63,0 | 10 | 8,1  8,7 | 81,0  87,0 | 15 | 10,3  9,7 | 68,7  64,7 | 8 | 7,0  6,4 | 87,5  80,0 |
| 21 | Sausage product | 26 | 17,8  12,6 | 68,5  48,5 | 14 | 13,1  9,5 | 93,6  67,9 | 21 | 11,1  8,6 | 52,9  41,0 | 11 | 8,7  6,9 | 79,1  62,7 |
| 22 | Whole fish | 45 | 12,4  13,6 | 27,6  30,2 | 35 | 9,8  10,5 | 28,0  30,0 | 35 | 10,4  12,2 | 29,7  34,9 | 25 | 6,3  8,9 | 25,2  35,6 |
| 23 | Whole milk | 250 | 124,3  105,4 | 49,7  42,2 | 300 | 145,6  123,1 | 48,5  41,0 | 200 | 102,3  89,7 | 51,2  44,9 | 280 | 135,6  113,4 | 48,4  40,5 |
| 24 | Sour cream, cream | 20 | 11,3  9,5 | 56,5  47,5 | 20 | 10,7  9,0 | 53,5  45,0 | 16 | 9,2  8,1 | 57,5  50,6 | 16 | 8,5  7,4 | 53,1  46,3 |
| 25 | Butter animal | 30 | 16,5  12,2 | 55,0  40,7 | 20 | 10,4  8,7 | 52,0  43,5 | 24 | 12,5  10,8 | 52,1  45,0 | 15 | 10,2  8,3 | 68,0  55,3 |
| 26 | Cottage cheese | 15 | 13,2  11,5 | 88,0  76,7 | 30 | 24,6  19,6 | 82,0  65,3 | 12 | 10,2  8,9 | 85,0  74,2 | 24 | 19,4  12,3 | 80,8  51,3 |
| 27 | Cheese, brynza | 10 | 11,4  8,1 | 114,0  81,0 | 10 | 12,0  7,4 | 120,0  74,0 | 8 | 8,9  6,6 | 111,3  82,5 | 8 | 9,1  6,2 | 113,8  77,5 |
| 28 | Egg (pcs) | 0,9 | 0,75  0,56 | 83,3  62,2 | 0,8 | 0,68  0,50 | 85,0  62,5 | 0,7 | 0,61  0,48 | 87,1  68,6 | 0,7 | 0,6  0,45 | 85,7  64,3 |
| 29 | Sugar | 55 | 13,1  12,4 | 23,8  22,5 | 35 | 8,9  7,6 | 25,4  21,7 | 44 | 8,2  7,4 | 18,6  16,8 | 40 | 7,1  6,9 | 17,8  17,3 |
| 30 | Vegetable oil | 25 | 21,2  17,3 | 84,8  69,2 | 25 | 20,9  15,9 | 83,6  63,6 | 20 | 15,4  12,5 | 77,0  62,5 | 20 | 14,8  11,3 | 74,0  56,5 |

*Note: When compiling the table, a set of products and basic nutrients for one day according to SanPin 0105-01 (Republic of Uzbekistan) was taken into account.*

In the surveyed (men over 60 years old, women over 54 years old) in the winter-spring period, the following data were obtained: the consumption of cereals was higher than nor­mal: men by 15.0%, women by 16.3%, and cheese by 11.3 and 13.8%. The consumption of other products was below the norm: meat prod­ucts for men by 27.3%, for women by 22.4%, sausage products by 47.1 and 20.9%; dairy products from 15.0 to 48.8% for men, from 19.2 to 51.6% for women; potatoes by 13.3 and 15.5%; vegetable oil by 23.0 and 26.0%. The availability of vegetables, melons and fruits turned out to be much lower than normal: men from 51.3 to 68.4%, women from 51.9 to 69.7%.

In the summer-autumn period (in men from 18 to 59 years, in women from 18 to 55 years), in contrast to the winter-spring period, the consumption of melons in men exceeded by 7.8%. In women, the consumption of wheat flour was 32.0% higher than normal, as well as fruits and fresh berries by 12.3%. Consump­tion of other products (meat and meat products, fish, milk and dairy, flour and other products) was below normal.

The same indicators were obtained in el­derly patients with CKD (55 years and older in women, 60 years and older in men). In the summer-autumn period of melons, they con­sumed more than the norm by 10.3%. There was a shortage of other products. It should be noted that even in the summer-autumn period, patients with CKD, regardless of the season of the year, consumed little vegetables, fruits, berries and greens.

The analysis of the diet also revealed a number of features. Thus, almost 85% of the examined patients with CKD aged 18 to 55 years violate the diet: four meals with a long interval (5-6). In old age, there was no desire for frequent consumption of food. Low physi­cal activity was revealed, especially in elderly people. Both the assortment list of products and the structure of nutrition had no utriani­tal differences.

**CONCLUSIONS**

1. Only 35% of the surveyed have an idea of rational nutrition and dietary nutrition in CKD. Only 28% of the surveyed could inde­pendently and objectively assess their diet, in most cases it was possible to find out with the help of medical professionals.

2. Irrational nutrition plays a signifi­cantly negative role in the development of CKD. It is obvious that only a conversation be­tween a doctor and a patient at a medical ap­pointment is not enough. It is necessary to de­velop and conduct an educational program to teach the basics of rational nutrition of patients with CKD.

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# HYGIENIC ASPECTS OF NUTRITION MICRONUTRIENTS DEFICIENCY IN PRESCHOOL CHILDREN

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***Abstract****. This article examines the nutritional status of pre-school age children and the changes that occur as a result of micronutrient deficiencies, cited in scientific sources in the last year, repeated in local and foreign articles published in various systems. The analysis of the results shows that the changes in the diet and quality of food among preschool children, their protein, fat, carbohydrates, minerals and vitamins, not only the nutrition of the growing organism, but also the nutritional status of the daily diet. . The dependence of the state of health, morbidity, and performance of preschool children on the quantity and quality of macro and micronutrients in the daily diet has been revealed through scientific sources.*

***Keywords.*** *Preschool age, diet, health status, macro and micronutrients in food.*

The hormonal development of preschool children do not depends on the level of con­sumption of micro and macronutrients in the diet in the development of various diseases that develop among them. Analysis of the literature shows that in all developed countries of the world, as well as in the USA, the Netherlands. Among children living in China, Russia, Ko­rea, Kazakhstan and other Commonwealth of Independent States (CIS), the incidence of not only iodine and iron deficiency, but also a number of mineral and vitamin deficiencies is increasing [8, 9, 49, 57, 66, 67, 69, 70].

Today, not only in developed countries, but also in a number of developed countries, including the United States, Canada, New Zea­land, China, Japan, Brazil, New Zealand, Rus­sia and other Central Asian countries, the use of fas-fut products among children magne­sium, zinc, vitamin deficiencies in the preven­tion of eating disorders, the organization of prophylactic and dietary diets, overweight, obesity, iodine deficiency disorders and the creation of conditions for their development are repeated in the work of a number of authors [23, 51, 60, 64, 65, 66, 72].

The human body does not produce min­erals, its presence depends only on the compo­sition of the food and diet consumed. Only 20% -40% of the minerals in food are absorbed by the human body [15, 23].

Calcium is involved in important meta­bolic processes in the body (glycogenolysis, gluconeogenesis, lipolysis, etc.), is directly in­volved in many functions [6, 28, 34, 45, 46, 56].

Calcium is one of the essential minerals required for optimal health of teeth and bones and is especially important during the intensity of the growth process in children [56, 58, 76].

Calcium plays an important practical role in many activities of the body, such as stimulation of hormone release, participation in muscle contraction, conduction of nerve im­pulses, activity of the immune system in men­tal work and education [40,41, 58, 56].

In the study of the average daily con­sumption of food for children in the middle and older age groups of children in CIS, an imbal­ance was observed, which was clearly mani­fested in individual products. In these children, orthopedic and dental pathologies were found to be 44-54% and the prevalence of caries was 28-33% when dispensaries were performed us­ing an additional dental and orthopedic auto­mated DNA complex. Calcium is involved in important metabolic processes in the body (glycogenolysis, gluconeogenesis, lipolysis, etc.), is directly involved in many activities [37,55,59].

Thus, ensuring adequate demand for cal­cium leads to growth, prevention of osteoporo­sis and osteopenia, as well as minimization of consequences in protection against bone frac­tures [61, 68, 76].

Some studies have shown that moderate calcium intake is important in the prevention of diseases such as obesity, hypertension, kid­ney stones, insulin resistance, and malignant tumors of the colon [61, 68, 76].

Biological uptake of calcium leads to the formation of lactose, vitamin D, fats, proteins, vitamin C and acidic environment [61]. Con­versely, a decrease in its biological degradation is associated with the amount of oats and phytic acid [61].

Thus, proper intake of calcium and other nutrients will be essential for healthy growth. One of the most important nutritional risks in childhood is the condition of irregular eating, in the occurrence of which three main links are important: the family, the media and pre­schools, school [1,2,3,48]. Irregular eating habits lead to many negative situations [4,21, 40,41].

Calcium-rich products (crabs, shrimp) are abundant in Vietnam and can be consumed by the entire population. However, the calcium problem was found to be inconsistent with the requirements proposed by the Vietnam Na­tional Institute of Nutrition [14, 18,57]. Cal­cium intake in adults was reported to be 524 mg/day per capita by 2000 [14,18,57], and by 2010 it had fallen to 506 / day per capita [14,75].

There is an increase in utrianinga and other diseases associated with vitamin D defi­ciency, along with calcium and phosphorus mi­cronutrients, which develop as a result of un­derutilization of milk and dairy products in children’s daily diet, impaired absorption of this micronutrient in the body, lack of calcium-containing diet and therapeutic dairy products [44, 45,46, 47,50,54,55].

Among the risk factors that are a priority in the formation of the health of various seg­ments of the population, the leading role is fo­cused on the organization of healthy eating. It is now widely acknowledged that 30-50% of the population living in the U.S. and Europe suffers from vitamin D deficiency [44, 52, 53, 55,61]. Population studies have shown a high prevalence of vitamin D hypovitaminosis among the pediatric population. 61% of chil­dren living in the U.S. had 25 (ON) D levels of 15–29 ng / ml and 9% less, 15 ng / mg D [30, 31,32, 44, 53, 62].

According to the results of epidemiolog­ical research, vitamin D deficiency and low amounts are also common among the utria­tion of a country such as Brazil where there is sufficient solar insulation. Deficiency of vita­min D less than 20 ng / ml was detected in 14% of children under 10 years of age residing in the state of Brazil and in 24% of adolescents [3,39,40,41,71].

Assessment of vitamin D status in the United Arab Emirates was performed on 183 children in 4 age groups of children. High lev­els of vitamin D deficiency have been reported to be higher among children aged 8–14 years than among children aged 2–7 years. This sit­uation is exacerbated by the fact that this age group is not always taken into account when calculating the need for vitamin D [39, 40,41, 63, 64,65].

In addition, the contribution of vitamin D in the growth and development of the human skeleton, combined with the composition of various foods, is of great importance. Calcium, a key component of bone tissue, leads to an in­crease in the mineral density of bone tissue. Adequate intake of calcium throughout life can prevent the development of rickets in children and osteoporosis in adults. Vitamin D defi­ciency is also a new problem for Vietnam, which has enough sunlight [1,3,38, 39,52,73,74].

Problems in the organization of nutrition of preschool children In all regions of Russia, when quantitative assessment of the composi­tion of individual foods in MTTs, the average shortage of meat, fish, cottage cheese, sour cream and butter was 23.2%, 20.4%, 16.8%, 30%. and showed results of 6.4%, respectively, with an increase in the amount of bread made from wheat flour in the diet (average 2.7%) and cereals, legumes and pasta (21.6%); deficien­cies in potatoes, vegetables, and fresh fruits were identified [3,20,25,26,73,74]. Evaluation of the current nutrition of preschool children showed an increase in consumption of confec­tionery (3 times), cereals and pasta, butter (1.4 times), meat (1.2 times), milk consumption (1.2 times) and fish. (1.5 times) was found to decrease [16,26].

In a number of regions of Russia children are significantly deficient in the daily diet of essential minerals – iron, fluorine, iodine, mag­nesium, copper, chromium, which can not meet the physiological needs of children [10,22,24,25].

The current and past economic opportu­nities for children’s nutrition in preschools, as well as the causes of violations of sanitary leg­islation in the organization of nutrition, will al­low to further develop a system of preventive measures to improve the study of the main causes of eating disorders. To do this, it is nec­essary to develop a unified system of socio-hy­gienic monitoring of the organization of chil­dren’s nutrition at the regional level, based on an i’-depth analysis of annual data [3,35, 36,73,74].

Studies on the hygienic assessment of children’s current nutrition in some preschools in Prevolj Federal District have shown that nu­trition is unbalanced [16, 29].

Children’s daily diets were found to be overactive due to increased carbohydrate, fat intake, however, decreased protein intake, es­pecially due to increased animal protein, vita­min-mineral deficiency was noted in children. While children received only bread, potatoes, and sugar in sufficient quantities from the products they were required to consume each day, there was a shortage of vegetables and raw fruits in the diet, and children not only did not consume dairy products regularly, but also consumed less than the daily norm [19,53].

A study of their current diet in organized children’s communities in Perm found that the amount of essential nutrients in the diet of pre­school children was lower than the average daily for the following substances: total protein was 76.9% of physiological consumption, fats – 74.2%, fats. -83.8%. The current set of weekly products was characterized by a lack of fresh fruits, fresh vegetable and fruit juices, sour milk products, cheese. Children received 30-39% less meat, 62-66% milk, 7-24% fish, 27% butter than the recommended consump­tion norms [17, 20,28, 29, 32, 33]. Physiologi­cal deficiency of micronutrients fluoride, io­dine, magnesium in the daily diet has a nega­tive impact on the body of children [17,20,40,41]. The analysis of practical utria­tion using the method of weighing children in MTY [3,17,20,40.41,73,74] showed that today the situation with the organization of nutrition in MTT in the city has not only changed, but also complicated, the main nutrients averaged 35%, carbohydrates 38%, proteins 28%, fats 30%, and micronutrients 14% [3,17,20,40,41,42].

According to the results of micronutrient content and cytomorphological examination of preschool children living in East Kazakhstan, the accumulation of lead, mercury, cadmium toxins in children’s hair fibers and a decrease in essential micronutrients (copper, selenium) in urine, as well as the number of cells with vacuolar dystrophy, apocytes nucleoli and buc­cal epithelium of the cheeks and an increase in the number of degenerated nasal cells were found [27,69].

This, in turn, can be explained to a cer­tain extent by the fact that children choose to eat food, that is, they do not eat until the end. Children often eat the first meal well because it has a relatively low density and a wide range on offer (bone, borsch, vegetable, mushroom, fish, dairy, chicken, pea, bean and minced soups), children have poorly consumed por­ridge. The children loved and ate rice, oatmeal and millet porridge. Vegetable dishes include pasta, oatmeal, and products that are less con­sumed than pancakes. The use of these rations has led to an imbalance in nutrient and energy intake. Deficiency of iodine, calcium and iron in the diet plays a leading role. Recommended consumption norms vary up to ⅓, with the deepest level and the most deficient cases [3,35,36,40.41,42].

Children living in Irkutsk, Russia, were divided into four groups according to the level of pollution in the city, and a significant varia­bility in the amount of zinc in their hair fibers was confirmed. The minimum zinc content in children of the southern production center of the region was 65.6 mg / kg, in 53% of samples the content of zinc was below the absolute norm, in 25% the indicators were below the bi­ologically acceptable limit, only in 8.5% of samples the zinc content was absolute. and ex­ceeded the biologically permissible limit by 3%. In 36% of rural children, the amount of zinc in the hair fiber is within the absolute norm, in 93% of children within the biologi­cally acceptable limit, and in 6% of children the zinc content in the hair fiber is within the absolute norm or biologically permissible limit. The highest concentrations of zinc in hair fiber were found in children living in the foot­hills and northern regions of the Irkutsk region, because it was in the soil of this region that the concentration of zinc metal was high. In the diet of the residents of the area, local food made from animal products is consumed the most, and the element zinc enters the body of children through this food. In areas with inten­sive production, despite the adequate amount of zinc in the environment, zinc deficiency is more common in the context of lifestyle and complex exposure to chemicals, not only due to the absorption of the trace element zinc, but also due to its absorption by children. depends on [60,61].

The WHO report on chronic kidney dis­ease, CKD (Chronic Kidney Diseases), states that one of the first causes of SBK is the effects of cadmium [43, 75,76].

Studies in humans and animals have shown that one of the reasons for the increase in blood glucose is an increase in the amount of cadmium in these environmental factors, leading to the development of some types of diabetes and chronic kidney disease [5,43].

Some researchers have focused on diet and heavy metal salts in the population in areas affected by CKD. At the same time, special at­tention should be paid to the amount of fluo­ride in freshwater and products grown in the region. The main part of the diet of the utria­tion living in areas affected by CKD consists of green leafy and other types of greens, leg­umes and fresh fruits [1, 3, 7,40,41].

Vegetables, legumes and other plants grown in this region retain high amounts of flu­oride due to the high content of fluoride in the soil and groundwater. For example, the cheap­est and most common amaranth vegetable in the region absorbs excessive amounts of fluo­ride from the soil [11,16].

It is clear that in these districts, which are rich in fluorides, the amount of excess fluoride enters the human body with a ration organized by plants grown in it. Researchers measured the translocation of fluorides from the soil to the body and fruit of plants and found that high concentrations of fluorides in the soil in this area led to high levels of fluorides in vegeta­bles grown in that soil [11, 12,13].

Thus, the high concentration of fluoride in the soil is due to the high concentration of fluoride in the soil composition and in the body and fruit of the surrounding plants [14].

A number of theories hypothesize that CKD is mainly caused by fluorides, cadmium, antimony, aluminum, mercury, uranium, vana­dium, waterborne toxins, or phosphates [4,7, 14]. However, none of these theories has been confirmed due to the lack of a sufficient scien­tific basis.

Subsequent theories mainly focus on pesticides and their potential compounds such as cadmium, mercury, fertilizers, especially glyphosate [11] and its negative impact on the environment, while other theories are devoted to the increase of ions in drinking water, oxi­dation-reduction processes in soil, utriani­ter aquifers as a result of the discharge of ma­nure-contaminated wastewater into river sys­tems.

Thus, it should be noted that the daily diet of preschool children is characterized by a lack of micronutrients from food and the pre­vention of diseases that develop as a result, the formation of a daily diet enriched with macro, micronutrients among preschool children, healthy. nutrition, the development of measures to promote a healthy lifestyle is one of the problems that need to be addressed to­day.

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# HYGIENIC CHARACTERISTICS OF DRINKING WATER SUPPLY OF THE URBAN POPULATION

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***АННОТАЦИЯ.*** *Представлены результаты анализа обеспеченности жителей города Ташкента доброкачественной питьевой водой. Из водозаборных сооружений вода подается в разводящую сеть после разных методах водоподготовки, и она соответствует требованиям ГОСТ «Вода питьевая» 950-2011 [1]. Предложен вариант ретехнологизации системы водоснабжения за счет повышения качества воды с помощью рассмотренных технологий водоподготовки. Выполнена оценка качества воды источника водоснабжения поверхностных (р. Бозсу) вод, а также предложены варианты технологий подготовки воды из этого водоисточника. Для обработки воды р. Бозсу предложено три варианта реагентных технологических схем. Это основные методы очистки питьевой воды – осветление, обессвечивание и обеззараживание питьевой воды.*

***Ключевые слова:*** *водопровод, отстойники, фильтры, хлорирование, обеззараживание, сеть, водоисточник, кишечные инфекции, коагулянт, органолептика*

**ГИГИЕНИЧЕСКАЯ ХАРАКТЕРИСТИКА ПИТЬЕВОГО ВОДОСНАБЖЕНИЯ ГОРОДСКОГО НАСЕЛЕНИЯ**

***АННОТАЦИЯ.*** *Тошкент шаҳри ахолисини сифатли ичимлик суви билан таъминлаш таҳлил натижалари тақдим этилган. Сув олиш қурилмаларидан олинган, турли усуллар ёрдамида тозаланган сув водопровод тармоғи орқали ахолига етказиб берилади ва у ДавСТ 950-2011 “Ичимлик сув” талабларига тўлиқ мос келади [1]. Сувни тозалаш технологиясини кўриб чиқиш ёрдамида сув сифатини ошириш ҳисобига сув таъмноти тизимларини ретехнолозация вариантлари таклиф этилган. Очиқ сув таъминоти манбалари сув (Бозсу дарёси) сифатини баҳолаш, шунингдек мазкур сув манбасидан олинган сув сифатини яхшилаш вариантлари таклиф этилди. Бозсу дарёсидан олинган сувни қайта ишлаш учун реагентли технологик схеманинг учта варианти таклиф этилди. Бу сувни тозалашнинг асосий усуллари, яъни тиндириш, рангсизлантириш ва зарарсизлантиришдир.*

***Калит сўзлар****: водопровод, тиндиргичлар, фильтрлар, хлорлаш, зарарсизлантириш, тармоқ, ичак инфекциялари, коагулянт, органолептика*

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***ANNOTATION.***  *The results of the analysis of the provision of residents of the city of Tashkent with good-quality drinking water are presented. From water intake facilities, water is supplied to the distribution network after various methods of water treatment, and it meets the requirements of "Drinking water" GOST 950-2011 [1]. A variant of retechnologization of the water supply system by improving water quality with the help of the considered water treatment technologies is proposed. The water quality of the surface water supply source (the Bozsu River) has been assessed, and options for water treatment technologies from this water source have been proposed. Three variants of reagent technological schemes have been proposed for the treatment of the Bozsu River water. These are the main methods of drinking water purification – clarification, bleaching and disinfection of drinking water.*

***Keywords****: water supply, settling tanks, filters, chlorination, disinfection, network, water source, intestinal infections, coagulant, organoleptics*

**Relevance of the work**: Water purifica­tion from man- made pollution is one of the most important and difficult tasks of our time. Drinking water – water of its quality in its nat­ural state or after processing, intended for hu­man drinking and household needs, or for the production of food products, must meet the re­quirements that are established by regula­tions. Unfortunately, it is becoming increas­ingly difficult to find clean natural water that is suitable for drinking. Natural reservoirs on the territory of Uzbekistan, which are used as a source of water supply, are characterized by high turbidity of waters, high color, as well as high average annual temperatures. There are two main problems in the supply of drinking water to the population – its quantity and qual­ity. Drinking water requires not only knowledge about chemicals and impurities necessary for life, but also radical ways to pu­rify water, especially from harmful substances. At water treatment plants, surface waters un­dergo traditional water purification technol­ogy. It includes reagent treatment, settling, clarification, filtration. Organic substances in the waters dramatically worsen the organolep­tic characteristics of water, thereby causing various kinds of odors, increasing color, and having an adverse effect on the human body and animals. Kadyrinskaya water intake facil­ity is one of the important sources of drinking water in Tashkent. It provides 78% of the pop­ulation of the city of Tashkent with high-qual­ity drinking water, in addition, it plays an im­portant role as climate-forming components of the landscape, and has a great aesthetic pur­pose. In this regard, monitoring the state of an eco-friendly reservoir system is an urgent task. In this article, a scheme for water treatment of water for the drinking needs of the population will be considered.

**The purpose of the study:**

To study the problems of drinking water supply of the population of large cities

Evaluation of the effectiveness of the Kadyrinsky head water supply facility

**Tasks research:**

1) hygienic assessment of water sources of centralized water supply;

2) study of water purification technol­ogy;

3) assessment of water-related diseases in the population of Yunusabad district in 2020-2021;

4) develop recommendations for opti­mizing the provision of high-quality drinking water to the population

**Materials and methods**: The material for the article was scientific articles, publica­tions published in scientific journals, educa­tional literature, electronic resources. The arti­cle uses sanitary-hygienic, epidemiological, statistical research methods.

The assessment of the quality of large water bodies of the Republic of Uzbekistan showed that the concentration of difficult-to-oxidize organic pollutants, estimated by COD (chemical oxygen demand), increases to the South of the country.

According to the requirements of GOST (state standart) 950:2011 "Drinking water", it is necessary to provide the population with good-quality drinking water. One of the ways to reduce pollutants in the water, in particular organic, is the use of effective methods of wa­ter treatment.

The Kadyrinsky water supply facility was put into operation on August 19, 1969. This facility carries out an open water intake from the BozSu canal, through a discharge channel, providing 78% of the total demand of the city for drinking water. The initial capacity is 225 thousand m3 per day.

To date, the capacity is 1,250,000 m3 / day The composition of the structures: settling tanks; reagent facilities; pumping stations; fil­tration station; chlorination station; clean water tank. The station has two settling tanks: I - the main settling tank with a capacity of 1 million m3 / day (length - 1500m; width -250 m; depth - 8 m) and II - a backup settling tank with a capacity of 500,000 m3/ day (length-600m, width-5 m, depth-3m). The sump is being cleaned – by a dredger. A coagulant is used to lighten the water at the station. There is a rea­gent farm for the preparation of the solution. The structure of the cathode includes: a hopper for receiving, storing and dosing coagulant. There are four receiving bunkers and three wet storage tanks for coagulant. Metered coagu­lants are transferred to the displacement cham­ber. Filters of different capacities are used for water discoloration. There are 48 filters in total at the station. It is a rectangular reinforced con­crete tank in which the filter loading is located. The filtration rate is 8 -10 m/hour. The total fil­tration area is 6700 m2. The station has ten clean water tanks with a capacity of 50 – 100,000 m3/day of water. This device is cleaned once a year. Water comes into contact with chlorine on the tank.

**The results of our research** have shown that the quality and condition of water from water supply sources according to the main indicators meet the requirements of GOST (state standart )950:2011. It is noted that the content of mineral substances in the water in almost all water areas of the Yunusa­bad district water supply source in Tashkent is normal. In Tashkent, the sources of water sup­ply for biogenic elements are not proportional, as evidenced by the normalization of water content of calcium (40-50 mg/l), fluorine (0.5-1.2mg/l) and iodine (50-70mg/l).

When analyzing the number and struc­ture of morbidity among the population of the Yunusabad district of Tashkent, the following results were obtained: in general, respiratory diseases are in the first place with morbidity (50.2%), gastrointestinal diseases are in second place (6.8%), and urinary tract diseases are in third place in a stable state (5.3%). In addition, the main types of diseases in the population are diseases of the musculoskeletal system, con­nective tissue diseases, diseases of the endo­crine system, nutritional disorders, infectious and parasitic diseases, dental caries.

Our research has shown that among the population of the Yunusabad district of Tash­kent, the first place among the diseases associ­ated with drinking water consumption is occu­pied by non-communicable diseases - dental caries, the second place - diseases of the gas­trointestinal tract, the third place - cardiovas­cular diseases, the fourth-place diseases asso­ciated with the urinary system, and the fifth place - patients with malignant tumors.

When comparing the specifics of mor­bidity of the population of the Yunusabad dis­trict of Tashkent, it is necessary to take into ac­count the influence of environmental factors in the region, including the quality of drinking water on morbidity rates.

Among the population, there is a statisti­cal decrease in the incidence of primary aller­gic diseases (R<0.05), as well as a significant decrease in the exacerbation of allergic dis­eases (R<0.05) as a result of the consumption of drinking water supplied to the population centrally at the open Kadyrinsky head water supply facility

Observations over two years showed that the incidence of atopic dermatitis in the population decreased (R < 0.01) in children with different water regimes as a result of con­sumption of centralized drinking water puri­fied in open and closed reservoirs.

The study of the incidence of diseases of the gastrointestinal tract among the population consuming drinking water from both open and closed water supply facilities and drinking wa­ter from head water pipes in a centralized man­ner showed that chronic diseases of the gastro­intestinal tract (gastroduodenitis, gastritis, co­litis) remained unchanged -9%. At the begin­ning of the study, it was found that functional stomach disorders in the population, gallblad­der dysfunction, unstable stools, are mainly de­tected in 15% of the population who consume water in a centralized manner of the Bozsu head water supply facility. It is likely that this situation is not related to the operability of the main structure of the structure, but to technical failures in the distribution network, cases of non-compliance of closed points with hygienic standards, and also due to the fact that the ex­piration of the service life of devices in the net­work

Depending on the composition of the source water used to provide the population of Yunusabad district with centralized drinking water, the incidence rates among the popula­tion living in these areas also differ, including in Yunusabad district, where the incidence falls mainly on the group of infectious diseases associated with the waters of the gastrointesti­nal tract.

In many cases, there were changes in the biochemical analysis of blood in the popula­tion of Yunusabad district with signs of choles­tase and cytolase (P<0.05) Of these indicators, ALT (45.2±2.2 IU/L), AST (40.5±1.8 IU/L), alkaline phosphatase (350±11.3IU/L), biliru­bin (24.4±1.8 mmol/l) cholesterol (5.8±1.4 mmol/l) in children with hepatitis A, one third of whose parents have a history of gallstones, gout, deforming arthrosis.

The final results of ultrasound examina­tion of the liver of the comparative group showed that the liver parameters remained un­changed (R > 0.05).

Our studies have shown that the con­sumption of water that does not comply with sanitary and hygienic standards leads to the formation of metabolic disorders in the body and the manifestation of changes in oxaluria from the urinary system.

The main dental diseases detected in the population of Yunusabad district are periodon­tal disease and dental caries. The prevalence and intensity of dental caries depends on a number of factors, the main of which are the amount of fluoride in the water, climatic, geo­graphical and social conditions. The main pre­ventive measures for dental caries include the use of fluorides.

Water supply of settlements – protects human health. Studying the structure of the morbidity of the population, it can be con­cluded that one of the main factors causing their diseases is the discrepancy between the water they consume and the requirements of sanitary hygiene.

When analyzing the quality of drinking water consumed by the population of the Yun­usabad district of Tashkent, it was found that poor-quality drinking water has an impact on the morbidity of the population. Samples are taken from the following points to determine the content of drinking water.

**Drinking water intake points of Yunusabad district (sampling points were determined among the population depending on the epidemiological situation in the area)**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Sampling location** | **Number of samples** | **Selection points** |
| 1 | Yunusabad district, street 7 School No. 41 | 100 | Inside the building |
| 2 | Yunusabad district street 2 Kindergarden N 240 | 100 | Inside the building |
| 3 | Chinabad Mahalla | 100 | From the yard |
| 4 | Mahalla shifokor | 100 | Inside the building |
| 5 | Mahalla Niezboshi yuli | 100 | From the yard |
| 6 | Shahristan Mahalla house 70 | 100 | From the yard |
| 7 | Mahalla Bodomzor house 200 | 100 | From the yard |

The number of sampling points in the Yunusabad district of Tashkent was 108, sam­ples were taken mainly from water supply net­works in epidemiologically disadvantaged ar­eas. The total number of samples taken from these points was 700. Samples are mainly ex­amined for organoleptic, chemical, and bacte­riological parameters. The organoleptic param­eters of the samples taken from these points comply with the requirements of GOST (state standart) 950:2011.

**Bacteriological indicators of drinking water of Yunusabad district of Tashkent for the last two years (2020-2021)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **N** | **Year** | **Indicators** | **Number of samples** | **+** | **-** |
| 1 | 2020 | TMN | 700 | 2 | 698 |
| 2 | 2021 | TMN | 700 |  | 700 |
| 3 | 2020 | if- index | 700 | 2 | 698 |
| 4 | 2020 | if- index | 700 |  | 700 |

*TMN – total microbial number*

The table shows that the bacteriological indicators obtained when supplying drinking water to residential areas of Yunusabad district comply with the norms of current legislation. The main reason for the deviation of the results by the number of pathogenic microorganisms is not a decrease in the efficiency of sanitary facilities at treatment facilities, but the pres­ence of secondary sources of pollution added along the way from treatment facilities to resi­dential areas.

**Physical and chemical analysis of drinking water in Yunusabad district (2020-2021)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **N** | **Indicators** | **Number of samples** | **2020 y** | **2021 y** | **MPC** |
| 1 | Ammonia | 400 | 0,00 | 0,00 | 0,01 mg/dm³ |
| 2 | Nitrites | 400 | 0,00 | 0,00 | 2-3 mg/dm³ |
| 3 | Nitrates | 400 | 7,32 | 6,65 | 45 mg/dm³ |
| 4 | Sulfates | 400 | 27,6 | 27,8 | 400-500 mg/dm³ |
| 5 | Chlorides | 400 | 5,0 | 5,13 | 230-250 mg/dm³ |
| 6 | Iron | 400 | 0,115 | 0,097 | 0,3 mg/dm³ |

*MPC – maximum permissible concentration*

Chemical indicators of the centralized drinking water supply system are evaluated mainly with complete and short sampling from the water supply. The indicators in the samples correspond only to the hygienic indicators of the current legislation on individual micro- and macroelements, including the technical and hygienic effectiveness of centralized treatment of the population of the Yunusabad district from local water supply, but deviations from the established norms arise due to technical malfunction of the devices.

According to the chemical analysis of the population from the centralized drinking water supply system, the amount of fluoride in the centralized water supply system in 2020-2021 was 0.2-0.3 mg/l, according to the samples taken. This indicator does not fully comply with the requirements of GOST (state standart) 950:2011.

When studying water-related diseases, the following indicators were studied in Yun­usabad district:

General morbidity in the following ar­eas:

1. Intestinal infections.

2. gallstone and kidney stone diseases

3. Hepatitis A.

In 2019, primary morbidity among chil­dren increased. This year, the overall incidence rate was 38 per 100 children, while in 2018 this figure was 22. The highest place in the struc­ture of morbidity was occupied by diseases of the upper respiratory tract, the second place - diseases of the digestive system, the third place - diseases of the musculoskeletal system. Among adolescents in the last 2 years, diseases of the blood, circulatory system, and genital tract occupy a high place.

According to the authors, the traditional method of disinfection of water using chlorine reagents also has a negative impact on the health of children. Excessive use of various chlorine compounds and additives to neutralize pathogenic microorganisms in water leads to the development of oncological and skin dis­eases in children.

**CONCLUSIONS**

1. The indicators of centralized drinking water supply of the population of the Yunusa­bad district of Tashkent fully comply with the requirements of GOST (state standart) 950:2011 on chemical indicators, except for the amount of trace elements in the water.

2.It was found that the composition of the open water of the Bozsu does not meet the requirements of GOST (state standart) 951:2011 in terms of its organoleptic and bac­teriological indicators in 2020, mainly due to the creation of private recreation areas around the Ugan River in the Tashkent region.

3. In 2020, the bacteriological indicators of water showed a result 3.8% higher than nor­mal. This is due to the entry of harmful impu­rities into the water supply network from sec­ondary sources of pollution.

4. Cases of diseases of the gastrointesti­nal tract, hepatitis A, non-communicable dis­eases (caries, fluorosis) have been identified among the population due to the entry of sec­ondary pollutants into the centralized water supply system.

5. The most effective method of disinfec­tion of drinking water without deterioration of its chemical composition, organoleptic proper­ties is ozonation, but its expensive cost is the first obstacle to its use in a mass state.

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# PECULIARITIES OF THE DEVELOPMENT OF OXALATE NEPHROPATHY IN CHILDREN IN THE ARAL SEA REGION AND THE REGIONAL APPROACH TO TREATMENT

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***Abstract.*** *In the complex treatment of acute and chronic kidney diseases in children, diet therapy plays an important role. High requirements are imposed on therapeutic nutrition, since the kidney is the main organ for the excretion of metabolic products that come with food and are formed as a result of the breakdown of body tissues, as well as the organ responsible for maintaining the constancy of the internal environment. Under certain conditions, it becomes necessary to correct in the diet of nutrients such as animal protein, gluten, oxalates, urates, phosphates, the metabolic products of which are excreted through the kidneys and affect not only the pathogenetic mechanisms of the development of the disease, but also participate in the formation of non-immune processes of progression disease to the stage of renal failure.*

***Key words:*** *children, dysmetabolic nephropathy, crystalluria, oxalaturia.*

**ОСОБЕННОСТИ РАЗВИТИЯ ОКСАЛАТНОЙ НЕФРОПАТИИ У ДЕТЕЙ В РЕГИОНЕ ПРИАРАЛЬЯ И РЕГИОНАЛЬНЫЙ ПОДХОД К ЛЕЧЕНИЮ**

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***Резюме.*** *В комплексном лечении острых и хронических заболеваний почек у детей важную роль играет диетотерапия. К лечебному питанию предъявляются высокие требования, так как почки являются основным органом выведения продуктов обмена, поступающих с пищей и образующихся в результате распада тканей организма, а также органом, отвечающим за поддержание постоянства внутренняя обстановка. При определенных условиях возникает необходимость коррекции в рационе таких пищевых веществ, как животный белок, глютен, оксалаты, ураты, фосфаты, продукты метаболизма которых выводятся через почки и влияют не только на патогенетические механизмы развития заболевания, но и участвуют в формировании неиммунных процессов прогрессирования заболевания до стадии почечной недостаточности.*

***Ключевые слова:*** *дисметаболическая нефропатия у детей, диетотерапия, кристаллурия, оксалурия.*

**OROL BOʼYI HUDUDIDAGI BOLALARDA OKSALATLI NEFROPATIYANING RAVOJLANISH DARAJASINING OʼZIGA XOS XUSUSIYATLARI VA DAVOLASHDA MINTAQAVIY YONDASHISH**

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***Rezyume.*** *Bolalarda o'tkir va surunkali buyrak kasalliklarini kompleks davolashda dietoterapiya muhim rol o'ynaydi. Terapevtik ovqatlanishga yuqori talablar qo'yiladi, chunki buyraklar oziq-ovqat bilan birga keladigan va tana to'qimalarining parchalanishi natijasida hosil bo'lgan metabolik mahsulotlarni chiqarib yuborishning asosiy organi, shuningdek, organizmning doimiyligini ta'minlash uchun mas'ul organdir. ichki muhit. Muayyan sharoitlarda hayvonlarning oqsillari, kleykovina, oksalatlar, uratlar, fosfatlar kabi ozuqaviy moddalarni ratsionda tuzatish zarur bo'ladi, ularning metabolik mahsulotlari buyraklar orqali chiqariladi va nafaqat kasallikning rivojlanishining patogenetik mexanizmlariga ta'sir qiladi. , balki kasallikning buyrak etishmovchiligi bosqichlariga o'tishining immun bo'lmagan jarayonlarini shakllantirishda ham ishtirok etadi.*

***Kalit so'zlar:*** *bolalarda dismetabolik nefropatiya, dietoterapiya, kristalluriya, oksaluriya.*

Diseases of the urinary system are be­coming one of the most pressing problems among children around the world. According to the World Health Organization, complica­tions of kidney disease are important for the public health system in all countries, depend­ing on the living place, lifestyle, gender, age, nutritional status of the population, the risk of life-threatening children and adults under the influence of environmental factors. Despite ad­vances in the treatment of dysmetabolic nephropathy (DMN) in children, it remains one of the most pressing problems in applied med­icine [1,5].

Particular attention is paid to a number of targeted scientific studies on improving the clinical and pathogenetic features, diagnosis and treatment of children and adolescents with kidney disease living in environmentally dis­advantaged areas. Despite the continuous im­provement of treatment methods, the rate of disability due to urological diseases is increas­ing. The largest share of inflammatory diseases in this system is urinary tract infection, pyelo­nephritis, dysmetabolic nephropathy (DMN) and urinary tract, their share is 94-96% [2,3,8]. The problem of material costs for the treatment and rehabilitation of these patients, which is di­rectly related to this, remains a burden for many states, especially those whose popula­tions are socially protected. The specificity of these diseases is often their late detection due to incompatibility and latent symptoms, as well as the vigilance of physicians as a result of de­layed treatment, requiring great attention by both physician and patient, long-term rehabili­tation and large material costs.

Addressing these issues is inextricably linked to identifying and eliminating (minimiz­ing the impact) of environmental risk factors that contribute to the emergence and develop­ment of disease, as all therapeutic and prophy­lactic measures that ignore this are, as a rule, ineffective or insignificant and short-lived. This is also important in this study, as we pro­vide information about a survey conducted by the population of Khorezm region - an environ­mentally unfavorable region, whose natural state is negatively affected by the drying up of the Aral Sea. The most important task in this region was to study the prevalence of oxalate nephropathy, as well as their desire to deter­mine the effectiveness of prophylactic treat­ment or prophylactic measures, their appropri­ateness, which became the basis for this un­precedented epidemiological study.

**The purpose of the study.** Development of proposals and recommendations for the pre­vention of dysmetabolic nephropathy among preschool and school-age children in Khorezm region.

**Materials and methods.** In order to achieve our goal, in 2017-2020, 1309 children aged 3 to 15 years in Khorezm region were sur­veyed. Children who underwent medical ex­aminations were divided into the following groups according to their anatomical and phys­iological characteristics: preschool children aged 3-6 years - 313 (32.5%), (boys 188 - 19.5%, girls - 125 13%), school-age children 7-10 years - 321 (33.5%) (boys 156 - 19.5%, girls - 165 - 17%), and 11-15 years - 326 (boys 162) - 16%, girls - 164 people - 17%). The main group consisted of 960 children from the initial period of DMN. The control group con­sisted of 40 healthy children of the same age, 52.7% boys and 47.2% girls, the first group ac­cording to Grombach.

**The result is observation.** In order to fulfill our tasks, we conducted our research in 3 stages:

**Phase 1.** The use and effectiveness of therapeutic and prophylactic measures in chil­dren treated for dysmetabolic nephropathy (DMN), urinary tract infection (UTI) and other kidney diseases in an inpatient setting is based on retrospective child development history (f.112), somatic department disease history (f. 003) identification;

**Phase 2.** Given the latent clinical course of the disease in the early stages of DMN, al­most no complaints in patients, and the appear­ance of salt crystals in the urine, a general clin­ical examination of 1,309 healthy children aged 3–15 years who did not complain of kid­ney disease was performed. Daily excretion of oxalate, urates, phosphates was detected in the presence of crystalluria. (Typically, the output of oxalate is 10-40 mg per day or 1 mg / kg per day, urate - 0.6-6.0 μmol per day, phosphates - 0.01-0.04 g / kg / day). Biochemical analysis of blood and urine in children with salt crys­tals, determination of renal function (calcula­tion of creatinine levels, glomerular filtration rate, Zimnitsky test). Attention was paid to the performance of the tubes (glucose, ammonia, pH, etc.).

**Step 3**. In order to correct and prevent the treatment of oxalate nephropathy in Khorezm region, taking into account the actual nutrition and drinking water, 211 children un­derwent clinical examination. In DMN disease, children were divided into 4 groups to deter­mine the use and effectiveness of the drug Ura­lesan in combination with diet. All group chil­dren were monitored in dynamics.

In the first phase of our research, accord­ing to statistics from 2012 to 2020 in Khorezm region, the incidence of diseases of the urinary system in children increased from year to year, while in 2012 the incidence of diseases of the urinary system in children in the region was 23.7%. by the year it was 46.1%.

In order to analyze the prevalence of children with DMN by physicians and to deter­mine how often urological diseases are diag­nosed and treated, we used a survey specifi­cally designed for physicians. A retrospective review of the medical history of 2,976 sick children aged 3–15 years treated in the pediat­ric ward alone in 2012–2020 found that 220 children, or 74%, had oxalate salts in their urine.

According to the anamnesis, these chil­dren often suffer from intercurrent diseases: in­fluenza - 60%, angina - 53%, acute respiratory diseases - 60%, bronchitis - 45%, pneumonia - 13%, acute intestinal infections - 36%, acute gastritis - 3 , 3%, food poisoning - 30%, hel­minthiasis - 53%, cystitis - 13%, rickets - 33%, ECD - 33.3%, anemia - 46.6%, bronchial asthma - 6.6%, food allergies - 46%, drug al­lergies - 6.7%, gastritis - 3%, VGA - 6%, skin diseases - 3.3%. Somatic and infectious, kid­ney diseases were also observed in the parents of these children. The majority of infants in the first year of life were breastfed (84.0%). How­ever, for whatever reason, a sufficient number of children were on artificial and mixed feed­ing (16.0%). More than half of children with metabolic nephropathy showed vitamin and micronutrient deficiencies, such as dry skin (92%), aphthous stomatitis (16%), brittle nails and hair (58%); in one-third of physical devel­opment - in the form of I-II degree protein-en­ergy deficiency (37%), in rare cases (8%) in stage I-II overweight was observed.

According to a comparative analysis of the Khorezm region's VDSENM municipal analysis conducted in 2017-2020, water scar­city has increased significantly over the past year. In 2017, the total number of trials was 19748, of which 1935 (9.7%) did not meet the trial requirement. In 2018, it was 2,170 (11.1%), and in 2020, the figure increased to 2,450 (13%). We determined the rate of occur­rence of DMN in children and the statistical correlation between their habitats, which was confirmed by a high reliability index of oxa­laturia-62% (R <0.001). Water content in wa­ter supply sources of all districts of Khorezm region is harmful to the organism and 2-2.5 times higher water hardness leads to the spread of ecological forms of dysmetobolic nephrop­athy (nephrolithiasis), which leads to the de­velopment of new and advanced technologies for treatment of natural and domestic drinking water. requires output and application.

An assessment of the nature of nutrition in our study showed that based on the results obtained in 2017-2020, it can be said that 2255 trials were conducted for 15 different food products out of 6349 examined. Of these, 30 did not meet the medical and biological re­quirements, 107 did not meet the requirements of GOST, and 2803 were found to contain toxic elements. However, the positive interac­tion of toxic elements means that they not only accumulate in the body of children with this pathology, but also synergism, which nega­tively affects the kidney structures and the im­mune system.

When we determined the salt residues in the urine of the children, depending on the mineral properties, the urate content was 11%, crystals 16.5% and oxalates 45.6%. In chil­dren, the specific symptoms of DMN disease are not clearly described. We were able to de­tect early clinical and laboratory signs of dis­ease in children selected by randomization. A study of children in the main group showed that 64% of preschool children had dry skin, and 77% of school-age children had thirst and low fluid intake per day, accompanied by met­abolic disorders, especially water-salt metabo­lism disorders. depends on the pathogenetic process.

The incidence of persistent crystalluria and microhematuria was 27.7% in preschool children in the main group. In the main group during the school period, more than half of the respondents were found to have insignificant proteinuria, as well as occasional pain in the morning eyelids, extrarenal appearance, back lumbar region, lower abdomen. Despite the early onset of metabolic disorders, children over 10 years of age had a risk of urinary in­continence (7%). Enuresis was present in up to 4.5% of preschool children, but not at all in school-age children. Physical retardation was almost the same in school-age children (11.4%) and, relatively, in preschool-age chil­dren (11.1%).

Our next study was to determine GFT levels in children with oxalate nephropathy, the most common (46%) in our main group, against the background of impaired phospho­rus-calcium metabolism in renal function. The results of the study showed that with a signifi­cant decrease in GFT levels (76.24 ± 0.95), a significant increase in serum creatinine and urea was found (R <0.001). However, in pa­tients with oxalate nephropathy, a significant decrease in total serum total calcium (1.98 ± 0.006) was observed with normal daily cal­cium excretion, which was statistically differ­ent from the control group (2.18 ± 0.018, R <0.001). This may be due to the binding of cal­cium to intestinal oxalates and a slight disrup­tion of intestinal absorption of calcium.

In our study, we selected 211 children aged 3 to 15 years from 960 children diagnosed with oxalate nephropathy. The children were divided into 4 groups:

**The children were divided into 4 groups:**

**Comparison group 1 (control)** - 40 children aged 3 to 15 years (20 girls and 20 boys) - treated with vitamins for 2 courses: vit­amin A (1000 BR / year / 24 hours), vitamin E (1 -1.5 mg / kg once daily), vitamin V6 (1-3 mg / kg once daily) continued with a 4-week break. When their children used vitamin ther­apy, the detection rate of crystalluria after 4 weeks was maintained at 68%, with a tendency to decrease uric acid excretion in the urine. Urinary excretion of leukocytes and renal epi­thelium in 57.8% of children was significantly reduced.

On the basis of vitamin therapy, there was also a decrease in multivitamin deficiency - dry skin, hyperkeratosis, stomatitis, positive changes, as well as in urinary syndrome: mi­crohematuria of patients in this group he lost 41.7% and 50% proteinuria. When treated with vitamins, a slight decrease in oxalaturia was noted, which lasted for 6 months. An important factor influencing the formation of crystals in the urine and the development of hematuria is the amount of calcium in the urine. Children in the control group were found to have the low­est Ca levels, and their levels did not change during the 6-month treatment period. A com­parative analysis of peripheral blood also ap­proached the norm relative to age. However, the effect of treatment with a vitamin complex was temporary. In all children, blood pressure readings did not exceed the norm relative to age.

**Group 2 - a group of children receiv­ing Uralesan syrup** - 41 children aged 3 to 15 years (22 girls and 19 boys admitted) - the amount was prescribed with a 1-month course of treatment according to age: school-age chil­dren - 3 times a day 5 ml; preschool children - recommended to drink 2-4 ml 3 times a day. In this group of children, a decrease in the excre­tion of salts from the urine was observed. Based on the group of patients receiving Ura­lesan, GFT increased by 10%, which is an in­dicator of preserved renal reserve. There was also a significant decrease in urinary excretion of 79.3% of leukocytes and renal epithelium in children. However, in 20.7% of children, these figures were maintained. In this case, the course of treatment with Uralsan should be re­peated in 2-3 months. Based on biochemical analysis, attention should be paid to ALT and AST enzymes. After the course of treatment taken by Uralsan, the content of these enzymes in the blood was significantly reduced com­pared to the performance of children in the control group. Free blood bilirubin was almost halved compared to the control group. Diuresis was almost doubled in the control group. Sig­nificantly altered AB readings returned to nor­mal as SAB and DAB in all children.

**Group 3.** The only group of children for whom diet was recommended for one year was 80 children (34 girls and 46 boys) aged 3 to 15 years. Drinking plenty of fluids is a versatile treatment for any DMN as it helps to reduce the concentration of soluble substances in the urine. We advised the child to drink more nat­ural, plain or mineral-enriched, bottled drink­ing water throughout the day. This is because drinking plenty of fluids throughout the day helps to eliminate urine from the body by re­ducing the acidic environment and reducing the amount of carbohydrates and calcium in the urine. This helps prevent the child from devel­oping chronic kidney disease and stone for­mation.

The goal of diet therapy is to prevent cys­tine from over-entering the child’s body with methionine and other sulfur-containing acids. To this end, products rich in amino acids, shavel salts, such as methionine and sulfur, such as cottage cheese, fish, eggs, meat, etc., were also excluded (or severely restricted) from the child’s diet. During such a diet, the intake of methionine in the body is reduced to 0.7 g per day. The child should consume at least 2-2.5 liters of fluid per day. This helps to increase the pH of the urine to 7.5–8.0. Treat­ment courses - 1-3 months, 2 times a year, in winter (December, January) and summer. In children whose diet was recommended, oxa­laturia was reduced by 70.2% compared with the control group, but crystalluria was up to 30%. In this group of patients, GFT based on dietary therapy increased by 7%. Improve­ments in peripheral blood analysis and bio­chemical parameters were still not significant. Decrease in stomatitis on the basis of diet ther­apy was noted, positive dynamics was also ob­served in urinary syndrome: microhematuria disappeared in 41.7%, proteinuria in 50% of patients in the main group. However, symp­toms such as dry skin, hyperkeratosis per­sisted. Thus, a high fluid intake regimen in di­etary treatment that did not achieve the ex­pected results in all children required the rec­ommendation of additional membrane stabi­lizers.

**Group 4.** In the group of children receiv­ing the Uralesan + diet, 50 children aged 3 to 15 years (27 girls and 23 boys) were selected. Undergo a course of treatment with Uralesan in an age-appropriate amount for 1 month: school-age children - 5 ml of Uralesan 3 times a day + diet for a year; preschool children - 2-4 ml of Uralesan 3 times a day and a diet for an additional year was recommended. All chil­dren underwent clinical-laboratory examina­tion before and after treatment. Children in groups 3 and 4 were examined every 3 months, and children in groups 1 and 2 were examined twice a year (at 6 months and 12 months).

In children in this group, a decrease in hematuria after a course of treatment (Uralesan + diet), differences in the decrease in the amount of calcium in the urine are especially significant. There was a tendency to decrease uric acid excretion in the urine. In addition, uri­nary excretion of leukocytes and renal epithe­lium was reduced by 1.5 times, and excretion of phospholipids was stopped. On the basis of treatment, the appearance of dry skin, hyper­keratosis and stomatitis completely disap­peared, a positive dynamics was observed in urinary syndrome: the loss of microhemor­rhage was 91.7%, proteinuria was 98.7%. All parameters except hemoglobin returned to nor­mal by changes in peripheral blood. The fol­lowing was noted during the study:

- Parents of all children of school age and children of preschool age noted the conven­ience of using Uralesan drugs;

- even some parents have given up vita­min complex therapy, citing the inconvenience of consuming large amounts of narcotics dur­ing the day, and Uralesan and diet have been proven to be preferred.

In our study, we also focused on oxalate crystals and daily diuresis, which are excreted in the urine of children in the treatment groups recommended for oxalate nephropathy.

The amount of daily oxalates in the urine of children in **control group 1** treated with vit­amins was almost indistinguishable from the pre-treatment condition in the post-treatment condition (first 1475.7 ± 63.8 μmol / day, then 1340.1 ± 61.9 μmol / day). The amount of ox­alate release did not decrease to the norm. Con­versely, after 6 months, it showed an increase in oxalate salts in the urine of children by 83% again. This proved once again the function of vitamins as they enhance the metabolism of all substances in the body. But it also shows that the scope of its effect on oxalaturia is relatively ineffective. The average daily urine output is also relatively low in this group of children. Even after treatment, it did not increase signif­icantly (first 620.6 ± 46.2 ml / day, then 695.7 ± 49.4 ml / day R <0.05).

**In group 2**, where children received only Uralesan syrup, the daily amount of oxa­lates in the urine was significantly different from the pre-treatment condition and the post-treatment condition (first 1751.0 ± 88.6 μmol / day, then 964.9 ± 52.8 μmol / day, R <0.05). The oxalates in the urine of these children were reduced by almost 2 times (in children aged 3-15 years, the amount of oxalates in the urine may be 98-280 μmol / day). This is mainly due to the fact that the drug Uralesan has the prop­erty of increasing the excretion of urea and chlorides, helping to drive small stones and sand from the bladder and kidneys. However, on the 30th day of treatment, crystalluria with oxalate was observed in 12% of this group of children, and a similar condition was re-de­tected during the examination 3 months after the start of therapy. On average, the daily urine output was low in this group of children before treatment. After taking the drug Uralesan, diu­resis increased significantly (first 796.3 ± 83.6 ml / day, then 1126 ± 60.5 ml / day, R <0.05). In doing so, we became convinced of the diu­retic function of the drug Uralesan.

**Group 3** - in the groups that underwent dietary rehabilitation only, the amount of oxa­late in the urine was significantly reduced (first 1765.6 ± 87.2 μmol / day, then 1077.5 ± 55.1 μmol / day), but did not meet the norm (nor­mal) 100-200 μmol / day in children aged 3-15 years). Of course, the restriction of consump­tion of foods containing oxalate salts, however, showed that the pathogenesis of secondary ox­alate nephropathy is mainly alimentary factor. The appearance of oxalate in the urine may be related to hot climatic conditions when fluid intake is insufficient. As a result of dietary treatment of children, it was found that the quality of water used is low and contains oxa­late salts. Hence, in the case of oxalate nephropathy, it has been shown that dietary foods alone are not sufficient to clear oxalate salts. Daily diuresis is also relatively rare in this group of children. Even after treatment, it did not change significantly, only increased to 140 ml (first 737.5 ± 82.3 ml / day, then 873.1 ± 91.1 ml / day, R <0.05).

The amount of oxalates in the urine of children recommended in combination with 4-Uralesan + diet was reduced by 3 times com­pared to pre-treatment levels (first 1757.0 ± 88.9 μmol / day, then 665.78 ± 49.3 μmol / day). It should be noted that the Uralesan + diet together with the elimination of the alimentary factor in the body at once, prevents the for­mation of oxalates in the urine, forming a pro­tective colloid. Daily diuresis was also less pronounced in this group of children before treatment. After co-administration of Uralesan +, the diuresis increased and approached the daily norm (first 828.6 ± 84.2 ml / day, then 1222.2 ± 96.8 ml / day R <0.001). Here again, we are convinced that the drug Uralesan en­hances diuresis.

**Conclusion.** Thus, the results of the study did not meet the expected results in the groups of children in Khorezm region who were recommended vitamin therapy and diet during the rehabilitation of preschool children and schoolchildren oxalate nephropathy. Also, during the rehabilitation period, only Uralesan-recommended children did not receive the ex­pected good results, they again observed oxa­laturia within 6 months after the end of the course of treatment. However, group 4 showed that Uralesan + diet was highly effective in children used concomitantly. The drug is given in combination with diet, helps to normalize metabolic processes, strengthen cytomem­branes, has an anti-inflammatory effect on the renal parenchyma and improves capillary blood flow. This complex would be an indica­tion for recommendation for complex treat­ment of children with oxalate nephropathy.

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# MODERN AND HYGIENIC FOUNDATIONS OF THE STRUCTURE OF MEDICAL AND PREVENTIVE INSTITUTIONS

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TashPMI Public health, organization and management of health care

**Actuality**: Sanitary and hygienic condi­tions in modern DPM, location of departments and wards, safety of employees.

**Purpose:** Placement of hospital hygienic treatment-and-prophylactic institutions

Norms and requirements for design, san­itary and technical support development Creat­ing the most suitable conditions for patients, conducting effective treatment processes and creating appropriate working conditions for medical personnel, as well as further registra­tion in accordance with quarantine rules.

**Methods of study:** Observations were carried out mainly in some family polyclinics in Tashkent and Tashkent region.

Studies show that in some hospitals there are shortcomings in the disproportionate loca­tion of departments and wards, the epidemio­logical safety of medical staff, sanitary and hy­gienic conditions, and compliance with quar­antine rules. In some clinics, neighboring de­partments of obstetrics, surgery and infectious diseases lead to further growth and spread of superinfections and nosocomial infections. We have seen this in the case of the COVID-19 pandemic.

The next observation was at Zangiata Hospital No. 2, which specializes in the treat­ment of patients with coronavirus infection. Observations show that the departments and wards of the hospital are located in accordance with modern requirements, the hospital is di­vided into clean and dirty corridors, convenient for communication between patients and staff, epidemiological safety of staff, full compli­ance with sanitary and preventive rules. It was noted that the disinfection work is proceeding at the proper level, the hospital is satisfied with the quarantine rules and is fully acceptable.

In the future, the relevance of designing when organizing CSAs, taking into account COVID-19 and similar quarantine conditions: first of all, the location of departments and wards, the division of corridors into clean and unclean zones, the placement of medical insti­tutions in separate areas or blocks, if possible, facilities should be located in buildings with 1 and 2 floors. In the future, the organization of an express laboratory in each department, spe­cial emergency resuscitation rooms, and the or­ganization of on-site X-ray examinations will be convenient and effective for patients and medical staff.

To prevent superinfection and nosocom­ial infection, PSM will be able to build mater­nity wards, pediatric wards, surgical and infec­tious diseasesdepartments in separate rooms or by placing them in separate blocks.

**Conclusion:** Build each hospital in sep­arate zones or separate blocks depending on their specialization, divide corridors into clean and dirty zones, place buildings, if possible, in 1 and 2 stored buildings, divide medical insti­tutions into separate zones or blocks depending on specialization and direction, the organiza­tion of disinfection work in each department is convenient for the prevention of nosocomial infections and pandemics and fully complies with modern requirements.

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# HYGIENIC ASSESSMENT OF BOILED SAUSAGES AND SAUSAGES PRODUCED BY «ROZMETOV» (UZBEKISTAN)

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The first series of experiments was car­ried out on 24 outbred adult rats of both sexes with an initial body weight of 122-140 g. The experimental animals were divided into 3 groups of 6 animals. The control group con­sisted of 6 animals.

To determine the parameters of acute toxicity, boiled sausage and sausages were given to rats in the morning on an empty stom­ach at the rate of 2500 (group 1), 5000 (2group) and 10,000 (group 3) mg/kg.

The second series of experiments was carried out on 6 outbred adult rats of both sexes with an initial body weight of 127-140 g. In this series of experiments, in order to obtain an extract solution per 100 g. crushed finished product was added 100 ml of 0.9% sodium chloride, the mixture was placed in a thermo­stat at a temperature of 37°C for 24 hours. Af­ter 24 hours, the extract solution was adminis­tered intragastrically at the rate of 3 ml per 100 g. body weight.

Observation of experimental. animals were administered hourly for 8 hours for 14 days. Symptoms of intoxication in animals have not been identified. Experimental animals reacted adequately to external stimuli. The hairline is shiny and smooth, no foci of bald­ness or ulcers were found. Visible mucous membranes are pale pink, unchanged. The death of animals was not detected when ex­posed to the maximum dose of 10,000 mg/kg. Due to the absence of death of animals, it was not possible to calculate the average lethal dose (DL50).

Thus, the acute toxicity of boiled sau­sages and frankfurters produced by Rozmetov LLC (Uzbekistan) can be attributed to class V in terms of the degree of toxicity.

The toxicity of boiled sausages and frankfurters produced by Rozmetov LLC (Uz­bekistan) was studied on 24 white rats under conditions of daily 30-day feeding of the stud­ied products at doses of 50 (group 1), 5000 (group 2) and 10000 (group 3) mg/kg. Animals of the control group were given 10,000 mg/kg of wheat porridge.

The results of the studies have shown that long-term feeding of boiled sausage and sausages in the studied doses is well tolerated by experimental animals. Indicators of general condition, behavior, weight gain, hematologi­cal and biochemical parameters of experi­mental animals did not differ from control val­ues. Thus, the observation of the dynamics of changes in the body weight of animals showed that with an initial body weight of 126.67 ± 2.53, after 30 days of experiments, increase in body weight up to 169.83±3.12 (in percent, the increase averages +34.07%).

The study of the dynamics of hematolog­ical parameters of peripheral blood after feed­ing boiled sausage and sausages did not reveal statistically significant differences in animals of the experimental groups compared with control values [Table 1].

The results of the study of biochemical parameters of blood serum of experimental and control animals after feeding with boiled sau­sage and sausages are presented in table [2].

Analysis of the research results showed that in experimental animals, the indicators of total protein, total bilirubin, direct and indirect bilirubin, urea, cholesterol, ALT, AST, gamma glutamyl transferase (in GT) and glucose in blood serum did not differ significantly from control values.

Thus, boiled sausage and diet sausages produced by Rozmetov LLC (Uzbekistan) with long-term feeding to white rats do not have a toxic effect on the hematological and biochem­ical parameters of experimental animals.

***Table 1.***

**Hematological parameters of the blood of rats after 30 days of feeding boiled sausages and diet sausages produced by OOO Rozmetov (Uzbekistan) at doses of 500, 5000 and 10000 mg/kg.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Groups, doses** | **Leukocytes,**  **1 O9 /l**  **WBC** | **Absolute content of lymphocytes, 109 /l** | **Absolute content of a mixture of monocytes, basophils and eosonophils, 109/l** | **Number of granulocytes, 109/l** | **Hemoglobin, g/l** | **Erythrocytes, g/l**  **RBC** | **Hematocrit, % No** | **The average concentration of hemoglobin in the erythrocyte**  **g/l less** | **Platelets in absolute numbers, 109/L PLT** | **thrombocrit,**  **% PCT** |
| **Control (intact)** | 1 4,95±1,11 | 6,5±0,43 | 2,67±0,28 | 5,2±0,40 | 139,3±5,45 | 6,57±0, 27 | 38,37±1,59 | 365,8±5,66 | 619,7±45,65 | 0.560±0.06 |
| **500 mg/kg** | 13,93±1,02 | 6,30±0,51 | 2,70±0,35 | 5,30±0,47 | 132,5±5,43 | 6,48±0,31 | 37,03±1,74 | 365±5,56 | 564,17±46,2 | 0.560±0.05 |
| **5000 mg/kg** | 14,0± 1,06 | 6,40±0,61 | 2,62±0,33 | 5,37±0,44 | 142,2±5,46 | 6,49±0,35 | 37,6±1,60 | 357±5,82 | 569,2±50 | 0.550±0.05 |
| **10000 mg/kg** | 1 4.47±1,1 5 | 6,50±0,47 | 2,52±0,20 | 5,22±0,50 | 130,7±5,26 | 5.82±0,43 | 37,62±1,17 | 364.2±5,54 | 620.67±45.65 | 0.570±0.04 |

***Table 2.***

**Biochemical parameters of the blood of rats after 30 days of feeding boiled sausage and diet sausages produced by Rozmetov LLC (Uzbekistan) at doses of 500, 5000 and 10000 mr/kr**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Groups, doses** | **Alanine aminotransferase activity, ALT, U/l (at 37°C)** | **Aspartate aminotransferase activity, AST, U/L (at 37°С)** | **Alkaline phosphatase activity, ALP, U/L (at 37°С)** | **Total protein, FR, r/dl (at 37°C)** | **Urea, Urea, mmol/l** | **Glucose,**  **glue, mmol/l** |
| **Control (intact)** | 76,63±4,22 | 330,83±20, 70 | 584,47±93,82 | 90,72±5,86 | 5,68±0,51 | 2,42±0,23 |
| **500 mg/kg** | 68,17±2,35 | 329,50±20, 17 | 474,13±78,34 | 86,03±6,25 | 4,56±0,37 | 2,20±0,26 |
| **5000 mg/kg** | 88,63±2,09 | 323,67±23,46 | 531,35±96,75 | 83,83±4,95 | 5,07±0,26 | 2,86±0,32 |
| **10000 mg/kg** | 64,38±3,45 | 321,17±29,04 | 594,85±64,35 | 90,65±6,66 | 4,71±0,50 | 2,88±0,31 |

**CONCLUSION**

Based on the examination of the scien­tific dossier, literature data and the results of toxicological studies of dietary boiled sausage and dietary sausages produced by Rozmetov LLC (Uzbekistan) at doses of 500, 5000 and 10000 mg/kg, it was established that, accord­ing to the parameters of acute toxicity when ad­ministered intragastrically, it belongs to a prac­tically non-toxic substance (class V).

The results of hematological, biochemi­cal and histomorphological studies of internal organs confirm that dietary boiled sausage and dietary sausages produced by Rozmetov LLC (Uzbekistan) at doses of 500, 5000 and 10000 mg/kg do not have a toxic effect on the body of experimental animals.

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**EXPERIMENTAL BIOLOGY AND MEDICINE**

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UDK: 611.367

# STRUCTURAL FEATURES OF THE HEPATIC-PANCREATIC AMPOULE OF RATS, RABBITS AND GUINE PIGS

**ОСОБЕННОСТИ СТРУКТУРЫ ПЕЧЕНО-ПОДЖЕЛУДОЧНОЙ АМПУЛЫ КРЫС, КРОЛИКОВ И МОРСКИХ СВИНОК**

**SICHQONLAR, QUYONLAR VA DENGIZ CHO‘CHQALARI JIGAR-O‘N IKKI BARMOQLI ICHAK AMPULASI TUZILISHINING XUSUSIYATLARI.**

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***Abstract:*** *the structural organization of the ampulla in 8 guinea pigs, 6 rabbits and rats was studied by using sequential serial histotopographic sections. It has been established that the structure and localization of the hepatic-pancreatic ampulla of rats, rabbits and guinea pigs differense significantly. In rats, this ampulla is located in the thickness of the wall of the duodenum and does not contain a fold. In guinea pigs, the ampoule is located above the wall of the duodenum. In rabbits, the ampulla of Vater's papilla is formed in the thickness of the longitudinal fold of the major duodenal papilla and contains many folds.*

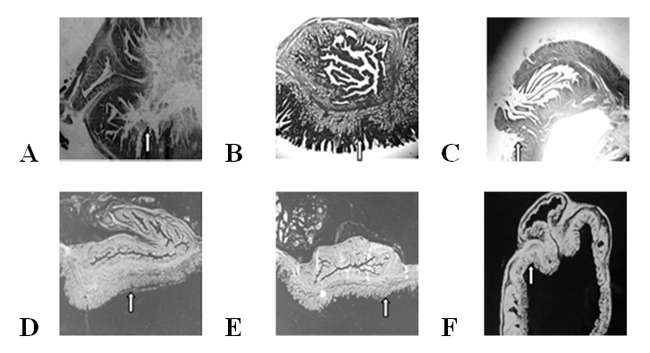
***Key words:*** *hepatic-pancreatic ampulla, comparative morphology.*

**Relevance.** The biliary system is the most complex part of the digestive tract. The presence of many sphincters and their coordi­nated and mutually coordinated work ensures the flow of bile into the duodenum at the time of digestion in it, and into the gallbladder out­side the moment of digestion in the intestine. The number of diseases of this system is stead­ily growing on a global scale. According to the scientific literature, surgical interventions for diseases of this system rank second after ap­pendectomy [2, 9, 10, 11]. In this regard, diag­nostic and therapeutic endoscopic manipula­tions are widely used in this area of ​​the diges­tive tract. However, the complication rate of some of these procedures remains high. Most often, such actions are subjected to a large pa­pilla of the duodenum (vater papilla). The he­patic-pancreatic ampulla is located in the thickness of the papilla. The study of the struc­ture of this ampulla was the subject of research not only in humans [1, 3, 6, 9], but also in var­ious laboratory animals [5, 7, 8]. Guinea pigs, rats and rabbits are commonly used laboratory animals for experimental research. According to the scientific literature, the morphology of the internal organs of each of them has some of its own characteristics [4, 10, 11]. However, in the available literature, we were unable to find data on the structural features of the hepatic-pancreatic ampulla, the place of its localization and opening into the duodenal cavity in these animals. Among diseases of the biliary system, cholelithiasis occupies a certain place. Stones of the gallbladder and bile ducts are localized in its different sections, and in certain cases, there are so-called impacted stones in the ter­minal section of the common bile duct, that is, in the lining of the major duodenal papilla. This circumstance is the reason for the great at­tention of clinicians and morphologists in the current century, which also justifies the rele­vance of our research.

**Purpose of the study.** Study of the com­parative morphology of the ampulla of the ma­jor duodenal papilla in rats, rabbits and guinea pigs.

**Material and methods of study.** The material for our research was the major duode­nal papilla of rats (representative of omni­vores), rabbits, and mrskie pigs (representa­tives of herbivores). We have studied the struc­ture of the hepato-pancreatic ampulla of Va­ter’s papilla in 6 rabbits, 6 rats and 8 guinea pigs. The slaughter of animals was carried out with strict observance of the rules of bioethics. The material was fixed in 12% neutral forma­lin, which was neutralized with a saturated so­lution of sodium tetraborate. Sequential his­totopographic sections (thick, overview) glued onto numbered glass slides were stained with hematoxylin-eosin and Van Gieson. Consider­ing in turn serial sections, we studied the mor­phology of the Vater papilla and the internal relief of its ampulla throughout.

**Results of own researches.** Rats do not have a gallbladder, and the common bile (he­patic) duct does not form a pronounced am­pulla, and the major duodenal papilla is weakly expressed. At the mouth of the duct, it forms a small expansion with a smooth surface of the mucous membrane. The hepatic-pancreatic ampulla of rats is weakly expressed and looks like an insignificant triangular cavity on the preparation (Fig. 1. A). The obtuse angle of this triangle is a slit-like orifice. The wall of the ampoule has a mucous membrane, which is covered from the inside by a prismatic epithe­lium. The surface of the mucous membrane is smooth structure; in some places it forms shal­low depressions. The muscular coat is well ex­pressed, located in a semicircle surrounding the ampulla, tapering wedge-shaped towards the mouth of the ampulla. The hepatic-pancre­atic ampulla of rabbits is well expressed in the form of an oval-shaped cavity and in the lumen it contains many folds of various configura­tions, sizes, and heights (Fig. 1. B). Most of them have a proximal-distal direction (Fig. 1. C). Guinea pigs differ from all animals studied by us in the special structure of the hepatic-pancreatic ampulla (Fig. 1. D, E, F). The lon­gitudinal fold of the duodenum is as if located outside of the duodenum and is attached to the serous membrane. The lumen of a complex ampoule on the preparation looks like a slit-like labyrinth. The orifice canal penetrates the wall of the duodenum through and through and opens into the intestine with a pinhole. Conse­quently, as such, they do not have a longitudi­nal fold of the duodenum.

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***Figure. 1.*** *Transverse histotopographic sections of the hepatic-pancreatic ampulla of a rat (A),*

*a rabbit (B., C), a guinea pig (D, E, F). The arrows indicate the mucous membrane of the duodenum. A, B - staining with hematoxylin-eosin, C - staining according to the Van Gieson method, D, E, F - staining with Ehrlich alum carmine; MBS, v.4, ok.6*

Thus, in rats that do not have a gallblad­der, the hepatopancreatic ampulla is absent. In rabbits, this ampulla is well expressed and con­tains numerous folds in the lumen. They have a proximal-distal direction and form a locking apparatus that prevents retrograde entry of the contents of the intestine into the ampoule.

The hepatic-pancreatic ampulla of guinea pigs differs fundamentally from those of rats and rabbits in structure and localization. These data should be taken into account when conducting experimental studies and interpret­ing their results. Based on the results of the study, we assume that the structure of the am­pulla of the papilla of Vater in the animals studied by us has its own distinctive morpho­logical features associated, apparently, with the presence or absence of a gallbladder, as well as the nature of their nutrition. The gen­eral principle of the structure of the ampulla of the papilla of Vater in the studied objects is identical.

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# STUDYING THE HYPOGLYCEMIC PROPERTIES OF THE EXTRACTS OF SOME MEDICINAL PLANTS ON THE MODEL OF EXPERIMENTAL DIABETES

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***Summary.*** *The hypoglycemic activity of medicinal plants was studied by intragastric administration of hydroalcoholic extracts of safflower flowers and celery leaves and a mixture of their extracts to rats with alloxan diabetes. As a result, with the course application of a mixture of extracts, the blood glucose level of animals decreased and approached normal values.*

***Keywords:*** *hypoglycemic activity, extracts of medicinal plants, alloxan diabetes, blood glucose level.*

**ИЗУЧЕНИЕ САХАРОСНИЖАЮЩИХ СВОЙСТВ ЭКСТРАКТОВ НЕКОТОРЫХ ЛЕКАРСТВЕННЫХ РАСТЕНИЙ НА МОДЕЛИ ЭКСПЕРИМЕНТАЛЬНОГО ДИАБЕТА**

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***Резюме.*** *Исследована гипогликемическая активность лекарственных растений путем интрагастрального введения водно-спиртовых экстрактов цветков сафлора и листьев сельдерея и смеси их экстрактов крысам с аллоксановым диабетом. В результате при курсовом применении смеси экстрактов уровень глюкозы крови животных снижался и приближался к нормальным показателям.*

***Ключевые слова:*** *гипогликемическая активность, экстракты лекарственных растений, аллоксановый диабет, уровень глюкозы крови.*

**AYRIM DORIVOR O‘SIMLIKLAR EKSTRAKTLARINING QANDNI KAMAYTIRUVCHI XUSUSIYATLARINI EKSPERMENTAL QANDLI DIABET MODELIDA O‘RGANISH**

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***Xulosa.*** *Dorivor o‘simliklarning gipoglikemik faolligi alloksan qandli diabet bilan kasallangan kalamushlarga saflora gullari va selderey barglarining gidroalkogolli ekstrakti va ularning ekstrakti aralashmasini oshqozon ichiga yuborish orqali o‘rganildi. Natijada, ekstraktlar aralashmasini kurs qo'llash bilan hayvonlarning qondagi glyukoza darajasi pasayib, normal qiymatlarga yaqinlashdi.*

***Kalit so'zlar:*** *gipoglikemik faollik, dorivor o'simliklarning ekstraktlari, alloksan diabet, qondagi glyukoza darajasi.*

Phytotherapy is an integral part of the complex treatment of diabetes mellitus. A large number of plants with hypoglycemic ac­tivity are described in the literature, but only a small part of them are used. The hypoglycemic effect of medicinal plants is due to the presence in their composition of a wide range of com­pounds with biological activity. Safflower flowers (Carthamus tinctorius) and celery leaves (Apium graveolens) have a number of therapeutic effects.

It is known that biologically active sub­stances, when used together, can enhance the effect of each other. In this regard, we studied the hypoglycemic activity of aqueous-alco­holic extracts of safflower flowers and celery leaves and a mixture of their extracts in rats with alloxan diabetes.

**Material and methods**. The studied ex­tracts were administered intragastrically for 2 weeks. Experimental animals were divided into 5 groups. group 1 - intact animals; group 2 - animals with alloxan diabetes (alloxan con­trol); group 3 - animals with alloxan diabetes treated with safflower flower extract; group 4 - animals with alloxan diabetes treated with cel­ery leaf extract; group 5 - animals with alloxan diabetes treated with a mixture of extracts of safflower flowers and celery leaves (1: 1).

**Research results.** The results of the studies showed that the blood glucose level in animals with experimental diabetes after a course of extracts decreased compared with alloxan control in all groups studied. Thus, the blood glucose level in rats with alloxan diabe­tes treated for two weeks with a mixture of ex­tracts of safflower flowers and celery leaves decreased from 18.4 mmol/l to 5.7 mmol/l and 8.5 mmol/l, respectively, while in rats with alloxan diabetes, it decreased due to spontane­ous regeneration of β-cells to 13.5 mmol/l.

**Conclusion.** With the course application of a mixture of extracts, the blood glucose level of animals also decreased and approached nor­mal values. The hypoglycemic effect of the studied extracts increased in the following or­der: celery extract, mixture of safflower-celery extracts, safflower extract.

**EVIDENCE-BASED MEDICINE**

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UDC: 614.2. 613.96/378.172

# VALEOLOGICAL CULTURE AS A COMPONENT OF THE EDUCATIONAL PROCESS IN THE FORMATION OF A HEALTHY LIFESTYLE

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***Abstract****: the cause of all non-communicable diseases is the lack of personal attention among young people to a healthy lifestyle, care for the continuation of their generation. Today's youth is ready to accept everything new and unknown, without thinking about the consequences. The for­mation of a healthy lifestyle is a key area of reform of the health care system in Uzbekistan. The study of the problem of healthy lifestyle of the younger generation in the sociological aspect is due to the peculiarity of this socio-demographic group, its individual formation and role in the educational process.*

***Keywords:*** *health, healthy lifestyle, valeological education, valeological culture of students.*

**ВАЛЕОЛОГИЧСКАЯ КУЛЬТУРА КАК КОМПОНЕНТ ОБРАЗОВАТЕЛЬНОГО**

**ПРО­ЦЕССА ПРИ ФОРМИРОВАНИИ ЗДОРОВОГО ОБРАЗА ЖИЗНИ**

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***Аннотация:*** *Причиной всех неинфекционных заболеваний (НИЗ) является отсутствие личного внимания у молодёжи к здоровому образу жизни, заботе о продолжении своего поко­ления. Сегодняшняя молодежь готова воспринимать всё новое и неизведанное, не задумыва­ясь о последствиях. Формирование здорового образа жизни (ЗОЖ) является ключевым направлением реформирования системы здравоохранения Узбекистана. Изучение проблемы ЗОЖ молодого поколения в социологическом аспекте обусловлено своеобразием данной соци­ально-демографической группы, индивидуальностями ее формирования и роли в образова­тельном процессе.*

***Ключевые слова:*** *здоровье, здоровый образ жизни, валеологическое образование, валео­логическая культура студентов.*

**СОҒЛОМ ТУРМУШ ТАРЗИНИ ШАКЛЛАНТИРИШДА ВАЛЕОЛОГИК МАДАНИЯТ ТАЪЛИМ ЖАРАЁНИНИНГ КОМПОНЕНТИ СИФАТИДА**

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***Хулоса****: барча юқумли бўлмаган касалликларнинг сабаби ёшлар орасида соғлом турмуш тарзига риоя қилмаслик, авлодни давом эттиришга бўлган жавобгарликнинг етишмаслигиир. Бугунги ёшлар оқибатлари ҳақида ўйламасдан умуман янги, номаълум бўлган барча янгиликларни қабул қилишга тайёр. Соғлом турмуш тарзини шакллантириш Ўзбекистонда соғлиқни сақлаш тизимини ислоҳ қилишнинг муҳим йўналишларидан биридир. Ёш авлоднинг соғлом турмуш тарзи муаммосини ижтимоий жиҳатдан ўрганиш ушбу ижтимоий-демографик гуруҳнинг ўзига хос хусусияти, унинг индивидуал шаклланиши ва таълим жараёнидаги роли билан боғлиқ.*

***Калит сўзлар:*** *саломатлик, соғлом турмуш тарзи, валеологик таълим, талабаларнинг валеологик маданияти.*

To date, the country has consistently taken measures to prevent, treat and control non-communicable diseases and their risk fac­tors, reduce premature mortality and morbidity of the population. At the same time, it is nec­essary to introduce an effective management system of preventive measures for the protec­tion of public health, which will make it possi­ble to apply uniform measures for the manage­ment of healthy lifestyle, maintaining a healthy diet and physical activity of the population [9].

In the conditions of the deteriorated level of youth health, attention to the healthy life­style of students of higher educational institu­tions is increasing, which indicates the concern of society with the problems of reproduction and the quality of the workforce and the human internal reserve as a whole. It is impossible to ensure a high level of training of specialists without strengthening the cognitive activity of the students themselves. To teach a student the vital need to work, the desire to be socially ac­tive, to develop their knowledge, the ability to take care of their own and others' health is one of the main tasks of universities [10].

Valeology is a fundamentally new field of knowledge based on modern ideas about the laws of wildlife and humans.

Promotion of a healthy lifestyle is a very important and irremovable socio-pedagogical task. The inclusion of the subject "Valeology" in the list of elective and academic disciplines of higher educational institutions is a natural phenomenon due to vital social and social needs. The problems of maintaining health and harmonious interaction of man and the environment are of a global nature and many spheres of culture, including education, are engaged in solving them.

Valeogrammativeness has become a mandatory component of versatile education. Since the ability to independently determine the parameters of one's own health, to support, strengthen and, if necessary, correct it is an index of high personal culture.

In order to improve the mechanisms for organizing and managing the prevention of noncommunicable diseases, the formation of a healthy lifestyle and increasing the level of physical activity of the population, as well as in accordance with the Decree of the President of the Republic of Uzbekistan dated December 7, 2018 # DP-5590 "On comprehensive measures to radically improve the healthcare system of the Republic of Uzbekistan", the Concept for the prevention of noncommunicable diseases, support a healthy lifestyle and an increase in the level of physical activity of the population for 2019 – 2022.

The subject of valeological education is the formation of a culture of health, a consci­entious attitude to one's health and the environ­ment as a condition and source of its preserva­tion and development. The result of such edu­cation is determined, on the one hand, by the level of theoretical knowledge about the prin­ciples of health and a healthy lifestyle, and on the other hand, by the existence of a valeolog­ical culture that allows a person to take an ac­tive position regarding the preservation and strengthening of their own health, to use skills and abilities to develop their probable capabil­ities.

A significant circumstance of the suc­cessful introduction of valeology in universi­ties is the pedagogical art, highly professional tools. And in order to improve it, it is necessary to generalize and promote such experience. Consequently, the more fully valeology enters the educational and life sphere of higher edu­cational institutions, the more effectively the greatest social mission presented to science and education will be realized: preservation of the Uzbek people, their health, their labor, re­productive, valeological security.

Two branches have already separated from the trunk of the general valeology. One is medical valeology, which is practiced by de­veloping health–improving mechanisms and methods, evaluating their effectiveness, tasks of preventing aging, strengthening reserve and adaptive capabilities, etc., the second branch is pedagogical valeology. Being in close connec­tion with medicine and having been created by medical professionals, valeology has now taken the form of a pedagogical discipline. It's enough to ask the question — what is valeol­ogy: Valeology is health through education. It is necessary to deal with health not only and not so much where people come with their ill­nesses, but where they study (in kindergarten, school, college, institute), since health care must be taught. And the role of the teacher is assigned to parents, educators and teachers. The valeological approach to the learning pro­cess is to find the chances of improving the health of students even before they get sick. And this is not limited to preventive measures. In this case, the task is deeper – to identify the aspirations that would support and develop a person's tendencies to be healthy, to realize himself in an excellent way [12].

The following competencies should be included in the basis of healthy lifestyle train­ing for medical university students: training in effective methods of disease prevention, taking into account age characteristics; formation of a responsible attitude to one's health and the principles of "responsible parenthood"; dy­namic monitoring of patients at risk of devel­oping NCDs; monitoring of functional and bi­ological reserves of the body taking into ac­count age characteristics. Such specialization of future doctors directs students to the fact that they should become valeologists, created to change a person's lifestyle in the direction of preserving his health. Teaching health-saving technologies takes into account the use of vis­ual domestic and publicly available foreign In­ternet materials adapted to the educational sphere [3].

An invariable condition for the effective­ness of this work is its purposefulness, regular­ity and continuity of implementation. The per­sonal and motivational qualities of this individ­ual, his life goals are of great importance in the basis of the formation of a healthy lifestyle. It should be noted that if humanity itself does not consciously form an individual style of healthy behavior, then no orders, recommendations, can force a person to lead a healthy lifestyle, protect and strengthen their own health, and even more so to be responsible for it. It follows from this that the promotion of a healthy life­style is a very important and responsible so­cio—pedagogical task. [1].

The study of practical experience and data from scientific and methodological litera­ture allowed us to put forward the following hypothesis: the use of traditional and non-tra­ditional means and forms of education with the leading role of active methods in the process of teaching valeology allows not only to form a complete picture of students' health and healthy lifestyle, but also to favorably influ­ence the formation of value orientations, struc­turing an active attitude to health and responsi­bility for their behavior [5].

In order to support the healthy lifestyle of the team of employees, to create all appro­priate conditions for increasing their level of physical activity, to form regular activities aimed at achieving these tasks, the following procedures have been introduced into practice: conducting industrial gymnastics exercises during the working day; holding at least once a week "Health Day" with participation on this day employees in sports and mass events (run­ning, swimming, football, volleyball, basket­ball, tennis and others); regular sports compe­titions in popular sports among employees and other physical culture and mass events [8].

In general, valeological education of stu­dents with reduced health allows you to regu­late the process of motivation of healthy life­style of young people. It is necessary to take into account the dominant values and personal orientations in the minds of young people and the development of the need for health to real­ize not only the biological, but, first of all, the social essence of a person. Motivation of the general health process in valeology and physi­cal education classes by teaching students knowledge, skills, and skills of maintaining a healthy lifestyle is inseparably linked with the education of the individual as a whole, the for­mation of an adequate understanding of human health and individual opportunities for its preservation and development.

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# TRANSLATIONAL MEDICINE - A NEW WAY FROM EXPERIMENTAL LABORATORY TO CLINICAL PRACTICE

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*The review article presents an analysis of modern problems in the development of medical sci­ence. The rationale for the need to develop a new direction in science - translational medicine, by creating conditions for the active transfer of the results of fundamental research to effective medical care is presented. To date, a colossal amount of information on molecular biology has been accumu­lated, subtle mechanisms of regulation of metabolic processes in the body, both under physiological and pathological conditions, have been revealed, and there are clear ideas on a number of patholo­gies, in particular, at the molecular and cellular levels. However, many aspects of such fundamental developments still remain at the level of theoretical material. The growing gap between understand­ing the causes of diseases and methods of their treatment is due to the fact that scientific developments and achievements are being introduced into practice for a long time or remain completely unclaimed in practical healthcare. The reason for this gap is related to the deepening specialization of theoret­ical researchers and experimenters, whose activities, with the amount of knowledge and time required for this, no longer allow them to combine scientific activity with medical practice. Translational med­icine, as a young direction in medical science, is still at the level of its initial translational barrier, and the task is to introduce new biomedical scientific and theoretical provisions and methods to the field of clinical use as much as possible.*

**TARJIMA TIBBIYOTI – EKSPERIMENTAL LABORATORIYADAN KLINIK AMA­LIYOTGA YANGI YO‘L**

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*Sharh maqolasida tibbiyot fanining rivojlanishidagi zamonaviy muammolar tahlili berilgan. Fundamental tadqiqotlar natijalarini samarali tibbiy yordamga faol o‘tkazish uchun shart-sharoit yaratib, fanning yangi yo‘nalishi – translatsion tibbiyotni rivojlantirish zarurligining asoslari ko‘rsa­tilgan. Bugungi kunga qadar molekulyar biologiya bo'yicha juda ko'p ma'lumotlar to'plangan, or­ganizmdagi metabolik jarayonlarni ham fiziologik, ham patologik sharoitlarda tartibga solishning nozik mexanizmlari aniqlangan va bir qator patologiyalar, xususan, ular haqida aniq fikrlar mavjud, molekulyar va hujayra darajasida. Biroq, bunday fundamental ishlanmalarning ko'p jihatlari hali ham nazariy material darajasida qolmoqda. Kasalliklarning sabablari va ularni davolash usullarini tushunish o'rtasidagi tafovut ilmiy ishlanmalar va yutuqlar uzoq vaqt davomida amaliyotga joriy eti­layotganligi yoki amaliy sog'liqni saqlashda mutlaqo talab qilinmaganligi bilan bog'liq. Ushbu bo'shliqning sababi nazariy tadqiqotchilar va eksperimentchilarning ixtisoslashuvining chuqurlash­ishi bilan bog'liq bo'lib, ularning faoliyati, buning uchun zarur bo'lgan bilim va vaqt miqdori endi ilmiy faoliyatni tibbiy amaliyot bilan birlashtirishga imkon bermaydi. Tarjima tibbiyoti tibbiyot fan­ining yosh yo‘nalishi sifatida hamon o‘zining dastlabki tarjima to‘sig‘i darajasida bo‘lib, klinik foy­dalanish sohasiga imkon qadar yangi biotibbiyot ilmiy-nazariy qoidalar va usullarni joriy etish va­zifasi qo‘yiladi.*

**ТРАНСЛЯЦИОННАЯ МЕДИЦИНА - НОВЫЙ ПУТЬ ОТ ЭКСПЕРИМЕНТАЛЬНОЙ ЛАБОРАТОРИИ К КЛИНИЧЕСКОЙ ПРАКТИКЕ**

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*В обзорной статье представлен анализ современных проблем развития медицинской науки. Представлено обоснование необходимости развития нового направления в науке – трансляционной медицины, путем создания условий для активного переноса результатов фундаментальных исследований в эффективную медицинскую помощь. К настоящему вре­мени накоплен колоссальный объем информации по молекулярной биологии, выявлены тонкие механизмы регуляции обменных процессов в организме как в физиологических, так и в пато­логических условиях, имеются четкие представления о ряде патологий, в частности, на мо­лекулярном и клеточном уровнях. Однако многие аспекты таких фундаментальных разрабо­ток до сих пор остаются на уровне теоретического материала. Увеличивающийся разрыв между пониманием причин болезней и методов их лечения связан с тем, что научные разра­ботки и достижения длительное время внедряются в практику или остаются совершенно невостребованными в практическом здравоохранении. Причина этого разрыва связана с углублением специализации исследователей-теоретиков и экспериментаторов, деятель­ность которых при необходимом для этого объеме знаний и времени уже не позволяет сов­мещать научную деятельность с врачебной практикой. Трансляционная медицина, как моло­дое направление в медицинской науке, пока находится на уровне своего начального трансля­ционного барьера, и задача состоит в максимальном внедрении новых медико-биологических научно-теоретических положений и методов в область клинического применения.*

On September 13, 1929, Alexander Fleming revealed for humanity his unique dis­covery - penicillin. Since then, for over a cen­tury now, biomedical research has been inten­sively developing. Unique discoveries in the field of genetics, molecular medicine and cell technology have opened up new possibilities for the fight against many diseases. Indisputa­ble evidence has been obtained of the mecha­nisms of development of a number of patholo­gies, which for centuries were considered a mystery of nature [26].

Medical science has its own peculiarity, which consists in a large gap between the dis­coveries in fundamental research and the pos­sibilities of applying the results in practical public health. Of course, the accumulation of theoretical information has its positive aspects - the creation of a knowledge base. Along with this, there is a need to reduce the distance be­tween fundamental research and the possibili­ties of their application in practical public health. This served as the basis for the emer­gence of a new direction in science - transla­tional medicine, that is, the creation of condi­tions for the active transfer of the results of fundamental research to effective medical care. At the same time, the specification of the direction of translation acquires a new variant in the form of personalized therapy. A clear re­lationship is created between the scientific la­boratory and the patient's bedside in nature from theory to treatment and from treatment to theory ("Bench-to-Bedside" and "Bedside-to-Bench"). In other words, translational medi­cine is an interdisciplinary medicine based on the achievements of physiology, molecular bi­ology, genetics and medicine and created to ensure high efficiency in the provision of med­ical services [1,3,8,11].

Initially, the term translational research was known, which was proposed in 1986 [11,12,15]. Subsequently, in the light of the de­velopment of the direction of development by the practical aspect of the introduction of theo­retical developments into practical healthcare (new methods of diagnosis, prognosis, treat­ment, prevention, etc.), this direction acquired a more specific definition as translational med­icine. At the same time, in 2010, the definition of translational medicine was already intro­duced as a method of applying experimental discoveries to clinical research.

As you know, the main goal of scientific and practical medicine is to improve the results of treatment of patients by conducting funda­mental research, determining the biological patterns of the relationship between systems and structures of the body. It was the discover­ies in the development of antibiotics and vac­cines, understanding the mechanisms of re­structuring of the body in complex biological situations, the invention of anesthesia, the prin­ciples of asepsis and antiseptics that made it possible to make a breakthrough in the medical industry. All this served as the basis for the for­mation of the direction of biomedical sciences, which cooperates in its foundation with such areas as molecular medicine, genetics, cell technology, genomics, metabolism, etc. [17,19,20,23].

Translational medicine is "a new field of knowledge that integrates elements of patho­physiology and approaches to the development of new therapeutic and diagnostic tools." It is "an evolving field of knowledge that focuses on using what is revealed in preclinical studies to bring ingenious and effective new steps in the clinic." Given the enrichment of theoretical knowledge through information from clinical observations, translational medicine is defined both as an all-encompassing scientific process that links basic research with clinical results, and as “a shift in the system of concepts in the tactics of new drug development, pharmaceu­tical economics and patient care” [28 , 29].

To date, a colossal amount of infor­mation on molecular biology has been accu­mulated, subtle mechanisms of regulation of metabolic processes in the body, both under physiological and pathological conditions, have been revealed, and there are clear ideas on a number of pathologies, in particular, at the molecular and cellular levels. However, many aspects of such fundamental developments still remain at the level of theoretical material. The growing gap between understanding the causes of diseases and methods of their treatment is due to the fact that scientific developments and achievements are being introduced into prac­tice for a long time or remain completely un­claimed in practical healthcare. The reason for this gap is related to the deepening specializa­tion of theoretical researchers and experiment­ers, whose activities, with the amount of knowledge and time required for this, no longer allow them to combine scientific activ­ity with medical practice. At the same time, the development of certain theoretical areas of bi­omedical knowledge, the accumulation of an increasing amount of scientific information makes it difficult to understand, perceive, and even more so the possibility of using this infor­mation by practitioners working “at the pa­tient’s bedside” [5,26].

This implies the need to train specialists who combine the professional competence of a “clinician” and a “researcher”, in contrast to the classical model of medical education, which concentrated resources on training in a real clinical situation without recognizing the essential role of an integrated interdisciplinary approach. Awareness of this situation by spe­cialists in many countries in the field of health care or, rather, in the field of organization of medical science, medical education and practi­cal medicine led to the conclusion that it is nec­essary to transfer (translate) modern theoretical provisions of medicine to real medical care for a particular patient.

The definitions of the concept of transla­tional medicine are somewhat different for dif­ferent authors, which, in all likelihood, is due to its initial versatility and breadth, which makes it possible to predominantly focus on its various aspects. According to some authors, this concept is nothing but a new term. How­ever, one cannot but agree that the practicing physician and the researcher in the field of medicine are now so far apart from each other that it has become necessary to create a special strategy aimed at building "crossings" between them. It is these tasks that translational medi­cine is designed to solve, the purpose of which, like medicine in general, is to increase the effi­ciency and effectiveness of therapy aimed at improving the quality of life and/or its dura­tion.

It should be emphasized that the concept of translational medicine is broader than "translational research", since along with them, it also includes the organizational side: the in­troduction of changes in medical education, in the organization of the pharmaceutical indus­try, in the interaction and relationships of vari­ous, today largely disparate, medical and bio­medical institutions [6, 30].

Translational medicine plays a leading role in optimizing the mechanisms for transfer­ring the results of fundamental biomedical re­search into diagnostic, preventive and thera­peutic technologies. Together with biotechnol­ogy and new imaging techniques, translational medicine will form the basis of progress in medicine. One of the main tasks of transla­tional medicine in the creation of new biologi­cally active substances is the coordination of research between research institutions, phar­maceutical and biotechnology companies, as well as the search for ways to improve the ef­fectiveness of existing drugs and promote in­novation in the pharmaceutical market [10,31].

Thanks to the development of molecular biology and molecular medicine, some pro­gress has now been made in elucidating the pathogenesis of many diseases at the molecular and cellular level. An important place in this direction is occupied by the development of new diagnostic tools, the purpose of which is the timely detection of specific biomarkers that make it possible to personalize therapy, i.e. choose the most effective therapy strategy for a particular patient. Biomarkers are becoming an integral part of clinical research. The term "biomarker" was introduced by the US Na­tional Academy of Sciences for biological monitoring of the population. A biomarker is a system of indicators (markers) characterizing the functioning of an organism, its interaction with agents of different nature [26,32].

The discovery of specific biomarkers in combination with the introduction of new ef­fective drugs and the analysis of the individual characteristics of their action serve as the basis for the development of personalized medicine. These activities should contribute to increasing the effectiveness of therapy, reducing the ex­isting gap between theoretical and practical medicine.

Translational medicine covers almost all branches of medicine: oncology, cardiology, research in genomics, molecular biology, neu­roscience, engineering biology, cardiovascular disease, drug delivery, cell culture, bioinfor­matics, and health policy. The importance cur­rently attached to the development of transla­tional medicine in the world is evidenced by the emergence of new specialized journals - « Journal of Translational Medicine ", " Science Translational Medicine ", " American journal of translational research ”, which bring to­gether scientists in the field of basic and clini­cal research in their quest to improve the qual­ity of patient care, promote the exchange of in­formation and ideas among practitioners and specialists in basic and clinical research [2,4,7,13,33].

Due to the scale of the tasks of transla­tional medicine, much attention is paid to the training of relevant specialists, which is al­ready being carried out in a number of medical colleges and universities, for example, in the USA and the UK, where a specialized course "Molecular and translational medicine" has been introduced. Centers for translational med­icine have been created and are functioning, uniting and coordinating relevant research in various fields of medicine [34,40].

The emergence and development of translational medicine is aimed at improving the efficiency of diagnosis and treatment of diseases, predicting the course of the patholog­ical process. At the same time, on the one hand, the most rapid translation of scientific achieve­ments into clinical practice is assumed, and on the other hand, their personalized, that is, their individual application, taking into account the state of the molecular, biochemical and meta­bolic characteristics of a particular patient [9,24].

We analyzed the results of determining the role and place of non-respiratory lung func­tions in the pathogenesis of the development of surgical sepsis against the background of se­vere forms of purulent-inflammatory diseases of soft tissues. Taking into account the fact that the earliest violations of the non-respiratory function of the lungs in the pathogenesis of the development of surgical sepsis were attributed to the barrier-filtration function of the lungs, in the form of endothelial dysfunction in the lungs, it is this side of the changes that should form the basis of methods for predicting the generalization of the inflammatory process.

The translational study of the experi­mental block was transferred to 27 patients with sepsis against the background of severe forms of purulent-inflammatory diseases of soft tissues. In order to move to the third block of the translational study, a study was made of the level of specific metabolites characterizing the barrier-filtration function of the lungs. The conducted studies confirmed their identity to the revealed mechanisms of development of changes in this organ in experimental animals, namely, a direct correlation was found between the volume of lung tissue damage, the degree of change in the morphological substrate with deviations in the biochemical parameters of the blood. At the same time, a separate analysis of indicators of non-respiratory lung functions re­vealed changes that were personalized and can be combined into 2 subgroups.

The first group consisted of patients with severe forms of purulent-inflammatory soft tis­sues, in whom, after surgical treatment of a pu­rulent focus, no more than 2 clinical criteria for systemic inflammatory response syndrome (SIRS) were noted. In the second subgroup, pa­tients with 3-4 signs of SIRS were identified. The nature of the revealed changes in this group was identical in all patients. The person­alization of translational medicine is character­ized by the regularity of the pathogenesis of the disease under study. An example of personali­zation can be the following observation.

Patient R.I., 1953 г.b., (No. i/b 1031/790), was transferred to the multidiscipli­nary clinic of the Tashkent Medical Academy from the proctology department of the regional hospital of the Jizzakh region on 12.01.21 in a serious condition with a referral diagnosis “Condition after opening the ischiorectal paraproctitis. Sepsis. Diabetes mellitus type II. Complaints at admission to pain and the pres­ence of a purulent wound in the perineum, an increase in the size of the scrotum, fever, short­ness of breath, weakness, sweating, dizziness. From the anamnesis: sick for 2 weeks. Oper­ated on for ischiorectal paraproctitis in the clinic at the place of residence. Due to the de­terioration of the condition on 07.01.21, he was hospitalized in the proctology department at the place of residence. The antibacterial and detoxification therapy performed had no ef­fect, the patient's condition worsened, from 01/09/21 edema and hyperemia appeared in the scrotum, groin and anterior abdominal wall, fi­brilitic hyperthermia was replaced by hectic one. The patient's condition is grave. Tachyp­nea up to 28 times in 1 min. In the lungs on both sides, against the background of many different-sized moist rales, there is sharply weakened vesicular respiration. In the lower segments, breathing is not audible. Percussion - dullness of sound in the lower lateral sections on the left. BP 90/70 mm Hg, pulse 110 beats. in 1 min. Locally: in the area of the perineum and scrotum, there are several longitudinal wounds with scanty purulent discharge, around there are large areas of hyperemia of the skin without clear boundaries, the inflammatory in­filtrate was not of the correct form. Palpation around the wound and in the area of infiltration revealed subcutaneous crepitus and tenderness. Plain roentgenoscopy of the thoracic organs dated 01/12/21 showed a slight increase in the vascular pattern of the lungs with signs of finely looped cellular deformity of the lung root. The results of a non-blood culture test were negative. The diagnosis was made: “Syn­ergic necrotizing fasciitis of the perineum, in­guinal regions and anterior abdominal wall. Fournier's gangrene. SIRS4. \_ severe sepsis. Syndrome of multiple organ dysfunction". On January 12, 21, after preoperative preparation, surgical treatment of the purulent focus was ur­gently performed with excision of necrotic tis­sues of fascial structures and fatty tissue. Inci­sions were made in the inguinal regions with excision of necrotic tissues of the anterior ab­dominal wall. On the same day, catheterization of the aortic arch was performed through the right femoral artery. Samples of mixed venous and arterial blood were taken. Analyzes in a sample of mixed venous blood - total protein - 46 g / l, total lipids - 2.9 g / l, albumins - 43%, lactoferin - 1649 ng / ml; procalcitonin - 1 ng / ml; IL-1b - 46.3 pg/ml; IL-6 - 31.3 pg / ml; TNF-α - 23.8 pg/ml; NO -21.9 µmol/l; eNOS - 2.1 µmol/min/l; iNOS - 0.2 µmol/min/l; perox­ynitrite -1.9 µmol/l; von Willebrand factor -5.4 µmol/l; In the arterial blood sample - total pro­tein - 30 g/l, total lipids - 2.1 g/l, albumins - 23%; lactoferin - 2429 ng / ml; procalcitonin - 0.5 ng / ml; IL-1b - 32.4 pg/ml; IL-6 - 8.2 pg/ml; TNF-α - 16.8 pg/ml; NO - 24.2 µmol/l; eNOS - 4.3 µmol/min/l; iNOS - 0.07 µmol/min/l; peroxynitrite - 0.52 µmol/l; von Willebrand factor - 4.3 μmol / l. Started re­gional infusion according to the scheme. The noted positive dynamics from 19-20.01.21 was characterized by a decrease in hyperthermia to 37.5 ºС and tachypnea to 22 times per 1 min. Repeated samples of mixed venous and arterial blood were taken. In analyzes in mixed venous blood - total protein - 49 g / l, total lipids - 2.4 g / l, albumin - 33%; lactoferrin - 1243 ng / ml; procalcitonin - 0.5 ng / ml; IL-1b - 22.3 pg/ml; IL-6 - 27.4 pg / ml; TNF-α - 22.7 pg/ml; NO - 18.3 µmol/l; eNOS - 3.1 µmol/min/l; iNOS - 0.2 µmol/min/l; peroxynitrite - 1.8 µmol/l; von Willebrand factor - 3.2 µmol/l; In the arterial blood sample - total protein - 32 g/l, total lipids - 2.2 g/l, albumins - 28%, lactoferrin - 374 ng/ml; procalcitonin - 0.2 ng / ml; IL-1b - 12.8 pg/ml; IL-6 - 4.2 pg/ml; TNF-α - 14.5 pg/ml; NO - 22.5 µmol/l; eNOS - 7.2 µmol/min/l; iNOS - 0.05 µmol/min/l; peroxynitrite - 0.6 µmol/l; von Willebrand factor - 2.1 µmol/l. On the control fluoroscopy, confluent shadows are visible on both sides, diffuse interstitial edema with abundant spotted shadows, varying de­grees of decreased transparency of the middle and lower lung fields. The symptom of "air bronchography" is noted, enlightenments are visible along the large and medium bronchi.

Comparison of data on the barrier-filtra­tion function of the lungs with other clinical and instrumental data of surgical sepsis makes it possible to bring this information closer to the real conditions of the course of the patho­logical process under study.

Statistical processing of the information data array formed in this way made it possible to determine the most characteristic indicators, which formed the basis for constructing linear integral data in surgical sepsis. The conducted experimental studies created the conditions for translating data into clinical conditions. The continuity of these conditions also made it pos­sible to personalize the method for predicting the development of surgical sepsis against the background of severe forms of purulent-in­flammatory diseases of soft tissues.

Translational medicine, based on the achievements of molecular biology and medi­cine, which ensures high efficiency in the pro­vision of medical services, uses the accumu­lated arsenal of modern fundamental knowledge about the mechanisms of basic metabolic processes and their disorders to pro­vide effective medical care to a particular pa­tient, i.e. for personalized therapy. Personal­ized therapy is a new quality of medical ser­vices [34,37].

It is impossible to overestimate the role of translational medicine in oncology. The de­ciphering of the human genome and the devel­opment of genomics have made it possible to obtain information about the association of in­dividual genomic and proteomic disorders with the likelihood of certain diseases [14, 21, 22, 25, 35, 36].

Despite the increase in life expectancy in European countries, diseases of the cardiovas­cular system are among the main causes of death. At the same time, for various forms of heart failure, a correlation was established with the expression of a group of protein genes in­volved in many cellular, including signaling, processes. It has been shown that in these pa­tients there are changes in hundreds of genes involved in transduction, in energy-dependent metabolic processes, apoptosis, transmem­brane ion transport, maintenance of the struc­ture of the cytoskeleton and extracellular ma­trix [38, 39]. The clinical application of these data obtained in population studies can be based on them a detailed classification of car­diomyopathies and the prediction of response to appropriate therapy [16, 18, 27].

Thus, translational medicine, combining the success of scientific research, the informa­tiveness of diagnostic approaches and data from clinical studies, is designed to improve the efficiency and effectiveness of therapeutic intervention, and, consequently, improve the quality of life. Thus, when discussing ways to combat high mortality from cardiovascular dis­eases, many researchers note the need to over­come the existing gap between the available scientific and clinical data, on the one hand, and health policy, on the other, which can only be done through translational medicine - by se­quentially passing through the above-men­tioned translational barriers. Translational medicine, as a young direction in medical sci­ence, is still at the level of its first translational barrier, and the task is to introduce new bio­medical scientific and theoretical provisions and methods to the field of clinical use as much as possible.

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# PECULIARITY OF LAPAROSCOPIC FUNDOPLICATION FOR HIATAL HERNIA IN PATIENTS WITH HIGH BODY MASS INDEX

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***Summary.*** *The results of examination and surgical treatment of 22 patients who underwent laparoscopic Nissen-Rosetti fundoplication were analyzed. Depending on the constitutional features and body mass index, the authors proposed methods for introducing trocars and developed a com­puter program. The proposed software facilitates the determination of the most convenient points for the introduction of trocars, which makes it easy to manipulate the instrument without requiring their rearrangement, and thereby improves the clinical results of surgical interventions.*

***Key words****: laparoscopic fundoplication, computer program, hiatal hernia.*

**ОСОБЕННОСТИ ЛАПАРОСКОПИЧЕСКОЙ ФУНДОПЛИКАЦИИ ПРИ ГРЫЖЕ ПИЩЕВОДНОГО ОТВЕРСТИЯ ДИАФРАГМЫ У БОЛЬНЫХ С ВЫСОКИМ ИНДЕКСОМ МАССЫ ТЕЛА**

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***Резюме.*** *Проанализированы результаты обследования и хирургического лечения 22 боль­ных, которым выполнена лапароскопическая фундопликация по Ниссену – Розетти. В зависи­мости от конституциональных особенностей и индекса массы тела, авторами предложен способы введения троакаров и разработана компьютерная программа. Предлагаемое про­граммное обеспечение облегчает определение наиболее удобных точек для введения троака­ров, что позволяет легко манипулировать инструментом, не требуя их перестановки, и тем самым улучшает клинические результаты хирургических вмешательств.*

***Ключевые слова****: лапароскопическая фундопликация, компьютерная программа, грыжа пищеводного отверстия диафрагмы.*

**TANA MASSASI INDEKSI YuQORI BO‘LGAN BEMORLARDA DIAFRAGMA ChURRA UChUN LAPAROSKOPIK FUNDOPLIKASIYaNING XUSUSIYaTLARI**

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***Xulosa.*** *Laparoskopik Nissen-Rosetti fundoplikasiyasidan o‘tkazilgan 22 nafar bemorni tek­shirish va jarrohlik davolash natijalari tahlil qilindi. Bemorni tuzilishi va tana massasi indeksiga qarab, mualliflar troakarlarni kiritish usullarini taklif qildilar va komp'yuter dasturini ishlab chiqdi­lar. Taklif etilayotgan dasturiy ta'minot troakarlarni kiritish uchun eng qulay nuqtalarni aniqlashni osonlashtiradi, bu esa jarroxlk instrumentlarni qayta tartibga solishni talab qilmasdan manipulya­siya qilishni osonlashtiradi va shu bilan jarrohlik aralashuvlarning klinik natijalarini yaxshilaydi.*

***Kalit so‘zlar:*** *laparoskopik fundoplikasiya, komp'yuter dasturi, diafragmal churra.*

**Background.** Currently, the frequency of patients visiting a doctor with esophageal hi­atal hernias (EHH) of diaphragm is growing steadily. According to the WHO [1, 2], dia­phragmatic hernias are the cause of pathologi­cal conditions in every second elderly patient in gastroenterological practice. Laparoscopic fundoplication by Nissen, by Toupet and other minimally invasive methods are increasingly applied for surgical treatment of EHH. The ad­vantages of such interventions are obvious: the surgery is carried out through minimal inci­sions with the sizes of 10 and 5 mm that guar­antees a cosmetic effect; precise work with tis­sues is improved owing to the optical zoom of the target surgical area and the patient’s hospi­tal stay is significantly reduced. Due to these merits, the number of such interventions is in­creasing progressively [3].

Yet, the frequent implementation of lap­aroscopic interventions for EHH has generated a number of unresolved problems associated with recurrence of the disease, the develop­ment of dysphagia and other complications during the postoperative period. In addition, the laparoscopic surgery for elimination of EHH is not a routine intervention and requires high skills of endoscopic surgery from the phy­sician. This issue becomes even more tough when it comes to patients with a high body mass index (BMI). According to a number of researches, in this category of patients, the fre­quency of intra- and postoperative complica­tions and the rate of recurrence of the disease after laparoscopic fundoplication increased by about 2 times and reached up to 14-15% com­pared to patients with normal BMI [4, 5].

One of the key points of solving this problem is to create a comfortable operating environment, which, in our opinion, first of all, will be provided by choosing the right trocar placement for this category of patients.

Considering the statement mentioned above, **the purpose** of this study was to deter­mine the optimal trocar sites when performing laparoscopic repair of EHH in patients with high BMI.

**Methods and research materials.**

The results of the examination and selec­tive surgical treatment of 22 patients with EHH and BMI of more than 30, who were hospital­ized in the multidisciplinary clinic of the Tash­kent Medical Academy in the period from 2014 to 2019, were analyzed. All patients were divided into two clinical groups. The control group included 10 patients who underwent standard laparoscopic fundoplication (LFP) according to Nissen-Rosetti. The trocar site for the patients of main group (12 patients) was determined according to the calculations of the computer program developed by us.

All analyzed patients had a sliding EHH (type 1 EHH according to Hill). There were 9 women (55.9%) and 13 men (44.1%). The age of patients ranged from 42 to 68 years (mean age was 55.2 ± 8.6 years). Their average BMI was 32.2 ± 2.5 kg / cm2. There were not any particular differences in the above parameters of discrepancies in the compared groups.

One of the features of performing lapa­roscopic fundoplication in patients with high BMI is the strict abidance of the patient’s po­sition on the operating table: it should be with the position of head-up (when head is lifted as much as possible) that is used in the compared groups.

The stages of laparoscopic fundoplica­tion in the control group were as following:

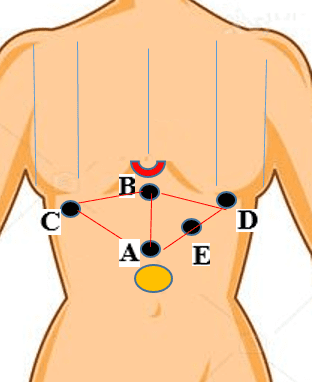
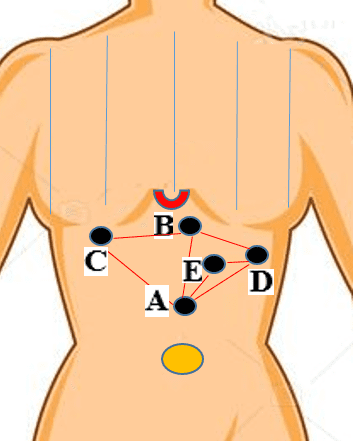
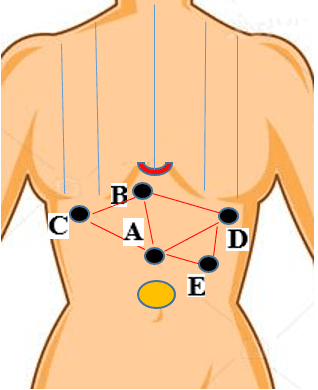
Laparoscopic fundoplication (LFP) was performed by introducing five trocars into the abdominal cavity. In this case, the first 10 mm trocar (A) was introduced above the navel at an angle; the second (B) 10 mm trocar was intro­duced 1 cm below the xiphoid process in the midline; the third (C) 5 mm trocar was intro­duced along the midclavicular line to the right, 4 cm below the costal arch; the fourth (D) 5 mm trocar was introduced along the anterior axillary line on the left, 3 cm below the costal arch; a fifth (E) 5 mm trocar was introduced to the left of the midline, 4 cm below the costal arch, at the intersection with the line connect­ing the second and third trocars. Then, the standard stages of the operation were per­formed: cruroraphy, fundoplication with the formation of a tensioned fundoplication cuff, capturing the front wall of the fundal part of stomach and passing it by the esophagus, 3-4 steps away from the large curvature, carried out to the right behind the esophagus, in an amount that is sufficient to form a tension-free cuff, a first suture is applied, without tension between the anterior surface of the fundus of stomach on the left, the anterior surface of the esophageal-cardiac transition and the wall of the stomach held behind the esophagus , the su­ture is tightened with five knots, and then con­tinue to form a continuous suture down, be­tween the front surface of the bottom of the stomach on the left, the front surface of the car­dia and the wall of the stomach drawn behind the esophagus, then continue suture between the front surface of the left side of stomach bot­tom and held behind the esophagus stomach wall without strain and a length of 5 cm, to form a full cuff.

In the main group, the points of introduc­tion of instruments for laparoscopic hernia re­pair were determined on the basis of our pro­gram - the “Hernioplasty.exe”, the program for calculating the insertion parameters of trocars for laparoscopic hernia repair, used to perform laparoscopic hernia repair for inguinal hernias (certificate from the Intellectual Property Agency of the Republic of Uzbekistan DGU No. 04043 on 10/04/2016). This access point selection program was also used to select ac­cess points for LFP.

To assess the effectiveness of the pro­gram for determining laparoscopic accesses, studies were conducted on the selection of op­timal laparoscopic approaches for hiatal her­nia.

According to the results, the distance of the working tools was from 5 to 10 cm, the depth of insertion of the tool was from 17-33 cm, and the angle of introduction of tools was from 38 ° to 65 ° (Fig. 1.).

So, in the first position, the triangular shapes of the geometric image in the ABC po­sition, with attitude to A, are located above the umbilical region at an angle of 45°, and in the ABD position at an angle of 60°.



I II III

**Fig. 1. Placement laparoscopic instruments by position**

*In this case, E is 2 cm lower along the drawn line from A to D points and with attitude to it they are at an angle of 120°. According to this type, LFP surgery was performed in 9 (37.5%) patients.*

*In the second position, the triangular shapes of the geometric image in the positions of ABC and ABD with attitude to A are located at an angle of 60°, i.e. in the form of two equiv­alent triangles. At the same time, E is at a cen­tral point along the line from A to D. For this type, LFP surgery was performed in 7 (30.2%) patients.*

*In the third position, the triangular shapes of the geometric image in the ABC po­sition, with attitude to A, are located at an an­gle of 110°, and in the ABD position at an an­gle of 70°.*

In this case, E is 2 cm higher along the drawn line from the A to D points and with at­titude to it they are at the angle of 120°. For this type, LFP surgery was performed in 8 (33.3%) patients.

**Results and discussions.** In the control group, the duration of LFP surgery in patients with a body mass index (BMI) below 30 kg / cm2 was on average 132.2 ± 2.1 minutes, in pa­tients with a BMI more than 30 kg / cm2 lasted for 152.2 ± 3.2 minutes. Due to the inconven­ience of performing the manipulation and poor visualization of the fundus of the stomach, the trocars, standard points and angle degrees in 11 (47.8%) cases in patients with a BMI of more than 30 kg / cm2 had to be intraoperatively re­installed. So, in three cases, the working parts of the tools did not correspond to their jobs in relation to each other, where the surgery was technically difficult and therefore the duration of the operation increased. In two cases, with the separation of the gastro-diaphragmatic and gastro-hepatic connections, damage to the dia­phragm and the left lobe of the liver was noted. In the postoperative period, one of these pa­tients showed pneumothorax on the left side, which resolved after thoracocentesis. In one (4%) case, during preparation of the gastric lig­ament, damage was noted to the branch of the left gastric artery where a hematoma was formed. In the postoperative period, the fol­lowing complications were observed: seroma of wounds in the navel area in 3 (13%) patients, pain in the epigastric area in 3 (13%) patients, dysphagia in 1 (4%) patient who completely cured after conservative therapy.

Thus, due to the impossibility of the ex­act orientation of the working laparoscopic in­struments in abdominal cavity and, without measuring the thickness of the soft tissue lay­ers of the anterior abdominal wall, technical difficulties arise in the operation and thereby increase the number and frequency of compli­cations in the early and late postoperative peri­ods.

In order to improve the technical aspects of performing laparoscopic hernia repair and reduce intra- and postoperative complications, we developed a computer software, what al­lows us to determine the optimal combination of the introduction of trocars and working tools.

In the main group, for all patients prior to LFP were determined the parameters of the introduction of trocars and working tools ac­cording to our software.

In the main group, the duration of sur­gery in patients with a body mass index (BMI) below 30 kg / cm2 was on average 110.3 ± 1.8 minutes, in patients with a BMI more than 30 kg / cm2 that pattern made up 115.1 ± 2.4 minutes. Moreover, in patients with a BMI of more than 30 kg / cm2, the duration of the op­eration was shortened by 30-35 minutes than in the control group. There were not any in­traoperative complications. The surgeries were completed without technical difficulties under adequate access to organs and good visualiza­tion. In the postoperative period, in two pa­tients had pain in the epigastric region, which relieved the day after antispasmodic therapy. There were not any other complications.

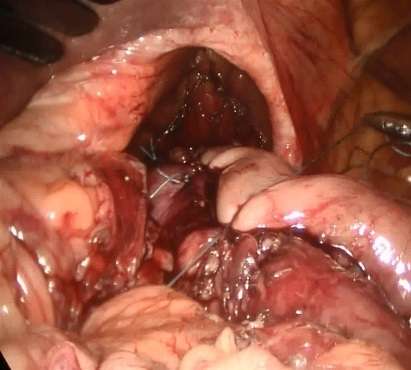
The reduction in the average time of the LFP completion is associated with the exact reference point of the operation area and the correct choice of the instrument insertion pa­rameters, the absence of the need to reinstall working trocars along the abdominal wall. Pa­tients after LFP were active as early as the next day after surgery.

Clinical example: Patient Z.Kh. 58 years old, clinical record No. 1104, complained of pain and discomfort in the epigastrium and left chest, shortness of breath, palpitation after having food. In anamnesis: the above men­tioned signs over the past 5 years, associates with physical exertion. Anthropometric data of the patient: height 164 cm, weight 87 kg. BMI 34 kg / cm2.

Diagnosis: Sliding esophageal hiatal her­nia of the diaphragm. Obesity 2nd degree.

Patient data on the surgery table at the re­quest of a computer program: patient data cor­responded to the third position in the geometric image of the instruments, and so, the distance from the table plane to the point of insertion of the instrument is 25 cm; the distance from the table plane to the area of ​​operation on the skin is 21 cm; fat fold thickness - 3 cm; muscle ap­oneurotic tissue thickness - 1.2 cm (according to ultrasound); the distance from the insertion point to the operation area along the table plane is 17 cm.

According to the result of the computer program for this patient, the distance of the in­strument from the muscle layer was 9 cm, the instrument was inserted 22 cm deep at an angle of 47 degrees.

**Fig. 2. Intraoperative view of the EHH**

For the patient was performed LFP. In laparoscopy, there was a fairly adequate view of the gastro-diaphragmatic zone (Fig. 2.). The surgery went without technical difficulties. The duration of the operation was 106.8 minutes. There were no intraoperative compli­cations. In the postoperative period, the patient was activated on the next day (Fig. 3.). We did not noted any complications. The nasogastric tube was removed on second day. The patient was discharged from the hospital on the 4th day of the surgery. Remote follow up period of 2 years. No recurrence.

**Fig. 3. The patient is after LFP, 1st day.**

Theoretically, laparoscopic hernia repair eradicates the risk of damage to the intra-ab­dominal organs and adhesions [6, 7, 8]. How­ever, the method is time-consuming, since the working space is limited and orientation may be difficult. Surgeons cannot begin this opera­tion until they gain the mastery of working with endosurgical instruments in order to freely navigate the anatomy of the preperito­neal space, in the inguinal region and at the same time, improper insertion of the instru­ment increases the likelihood of damage to nearby organs of the inguinal region.

The software "Hernioplasty.exe" is cal­culated based on the parameters of the patient, i.e. thickness of subcutaneous fat and muscle-aponeurotic layer of the abdominal wall, height of the abdomen from the plane of the operating table in the horizontal position of the patient. The software "Hernioplasty.exe" allows you to calculate the parameters of the introduction of a working trocar along with a laparoscope. Based on the software calculations, the angle of insertion of the instrument into the umbilical region and the depth of insertion of the instru­ment are determined, which allow surgeons to easily manipulate in the area of operation.

Thus, the effectiveness of the program we developed for laparoscopic fundoplication is determined by the fact that the exact intro­duction of endoscopic instruments by the sur­geon gives the correct orientation with attitude to the fundal region of the stomachs and the left cupola of the diaphragm, shortens the duration of the surgery and, reduces the frequency of in­tra and postoperative complications. In pa­tients with morbid and supermorbid obesity, the use of this program makes easily manipu­late the instrument without requiring their re­arrangement.

Our studies have shown the clinical ef­fectiveness of the complex of measures devel­oped by us, not only when performing laparo­scopic interventions on the organs of ab­dominal cavity, in particular, hiatal hernia.

**Conclusions**

1. Performing laparoscopic hernia repair with the implementation of standard points of introduction for instruments in patients with high BMI presents certain difficulties due to the pronounced thickness of the soft tissues of anterior abdominal wall and increases of the risk for conversion or reinstallation of instru­ments.

2. The proposed software facilitates the determination of the most convenient points for introducing trocars, which makes it easy to manipulate the instrument without requiring their rearrangement, and thereby improves the clinical results of surgical interventions.

3. The absence of complications in the intra- and postoperative period, proves the highly specificity and effectiveness of the pro­posed program for laparoscopic correction of EHH and is the key to reducing the risk of re­currence.

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