

ISSN: 2181-3337

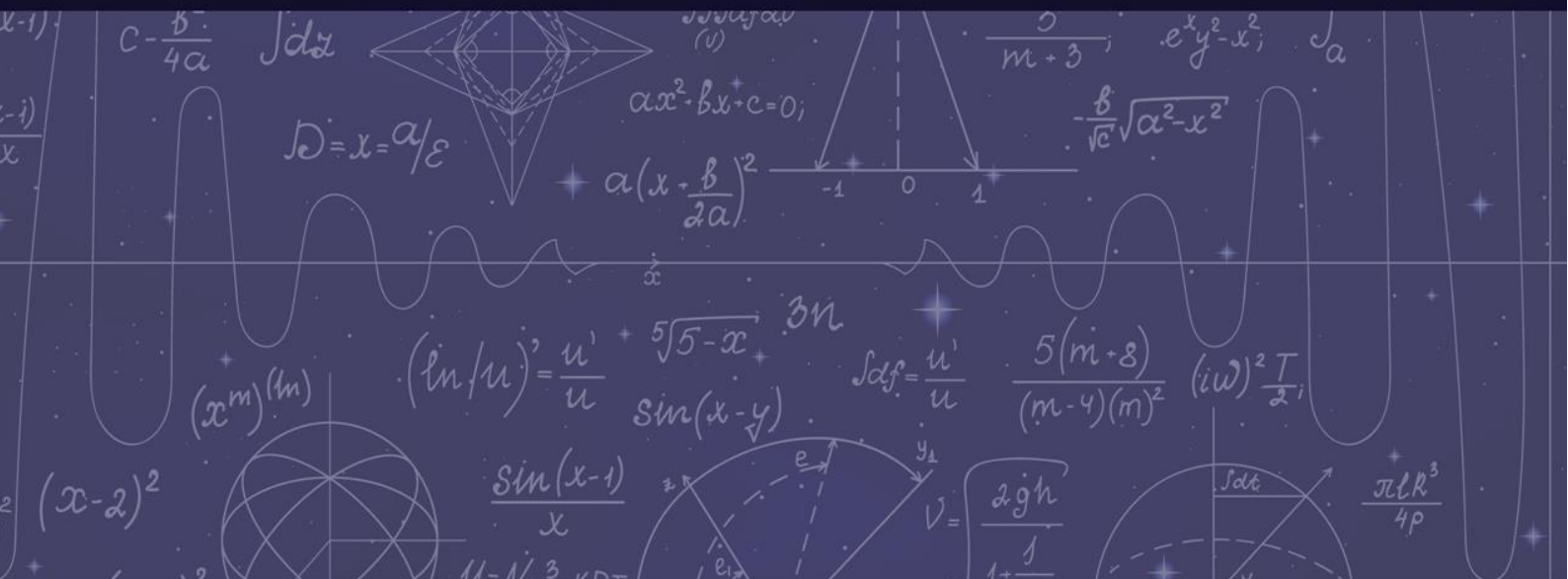
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International scientific journal  
**SCIENCE AND INNOVATION**

Volume 2 Issue 7  
July 2023

**D**

**BIOLOGY  
AGRICULTURE  
MEDICINE  
PHARMACETICS  
VETERINARY**





**International Scientific Journal**  
**SCIENCE AND INNOVATION**  
**Series D**  
**Volume 2 Issue 7**  
**July 2023**

[www.scientists.uz](http://www.scientists.uz)

**ISSN: 2181-3337**

**UIF-2022: 8.2**

**SJIF 2023: 5.608**

**International Scientific Journal SCIENCE AND INNOVATION.** Series D volume 2 issue 7 – 105p.

*The collection contains scientific articles accepted for issue 7 for 2023 of the international scientific journal "Science and Innovation".*

*In this scientific journal, in the form of scientific articles, the results of scientific research conducted by professors and teachers of the Republic of Uzbekistan and international higher educational institutions, independent researchers, doctoral students, undergraduates were published. In addition to higher educational institutions, the journal also includes scientific articles by employees working in other research institutes, production organizations and enterprises of our region and republic.*

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Jurnal rivojiga munosib hissa qo‘shgan eng faol targ‘ibotchilar, rasmiy vakillar, hamkorlar, tahrir hay‘ati a‘zolari va mualliflar uchun umumiy jamg‘armasi **130 mln so‘m** bo‘lgan pul mukofotlari yil yakunida topshiriladi. Pul mukofotlari quyidagi 2 xil nominatsiya ko‘rinishida taqsimlanadi:

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- 1-o‘rin 15 mln so‘m
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- 4-o‘rin 5 mln so‘m
- 5-o‘rin 3 mln so‘m
- 6-10-o‘rinlar 2 mln so‘m

Jami 50 mln so‘m.

**“Yilning eng yaxshi ilm-fan targ‘ibotchisi” nominatsiyasi** - jurnal faoliyatini rivojlantirishda, uni targ‘ib qilishda va olimlarimizning ilmiy maqolalarini chop etishda yordam berib kelayotgan eng faol bo‘lgan tashabbuskor insonlarga yil yakunida statuetka va pul mukofoti tantanali ravishda topshiriladi.

- 1-o‘rin - 30 000 000 so‘m.
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- 4-o‘rin - 7 000 000 so‘m.
- 5-o‘rin - 3 000 000 so‘m.
- 6-10-o‘rinlar - 2 000 000 so‘m.

Jami: 80 mln so‘m.

## IMPORTANCE OF MEDICINAL PLANTS ON HUMAN HEALTH IN PREVENTING VARIOUS DISEASES

Rasulov Ilhom Mahmudovich

Associate professor, PhD, doctor of agricultural sciences

<https://doi.org/10.5281/zenodo.8116741>

**Abstract.** Writing to this article assist the Decree No. PD-3968 of the President of Uzbekistan dated October 12, 2018 “On measures to regulate the field of folk medicine in the Republic of Uzbekistan”, PD-5707 dated April 10, 2019 “On measures to further develop the pharmaceutical industry of the republic in 2019-2021” Decree No. PD-4670 dated April 10, 2020 “On measures for the protection of wild medicinal plants, cultivation, processing and rational use of available resources” in preventing various diseases in the human body, a the significance of several medicinal plants was studied.

**Keywords:** *artemisia, alhagi, zizifora, herba bursae pastoris, plantago, harmalae, cichorium intybus, taraxacum, helichrysum arenarium, common yarrow, salvia, capparis, ferula, angina, tonsillitis, stomatitis, purulent otitis, anthelmintic, antiseptic, diaphoretic.*

**Introduction.** There are about 500,000 plant species on earth, and 6,000 of them are used. The nature of Uzbekistan stands out in the world with its uniqueness, plants, clear waters, mountains, forests, mineral resources, soil, air and inexhaustible aspects. There are more than 4650 species of wild plants, of which there are 577 medicinal plants, 103 medicinal plants with dyes, and 560 essential oil medicinal plants. It has been determined that there are 10-12 thousand species of medicinal plants on earth. The chemical and pharmacological properties of more than 1200 plant species have been investigated. These are 40-48%. So, it can be seen that the raw materials of medicinal plants have been used for centuries to restore human health. Medicinal plants are mainly dried: herbs, shoots, roots, rhizomes, buds, bulbs, bark, leaves, flowers, buds, fruits (seeds), seeds, and juice, pulp, essential oils are used to prevent various diseases and restore human health.

The importance of other medicinal plants for human health is presented in the table. For example: Glycyrrhiza, artemisia, alhagi, zizifora, herba bursae pastoris, plantago, harmalae, cichorium intybus, taraxacum.

### Importance of several medicinal plants for human health in preventing various diseases

Scientific name of medicinal plants	Importance for human health
1. Glycyrrhiza - (Glerrhizza glabra L.) a perennial plant belonging to the leguminous family.	Glycyrrhiza and its root juice and powders are used as antiperspirant, mild expectorant, in diseases related to respiratory tract colds, expectorant, and help in shortness of breath. A decoction prepared from its roots has the properties of treating gastric and duodenal ulcers. A decoction of the root is drunk in case of meat and mushroom poisoning.



<p>2. Artemisia - (Artemisia absinthium L.) Asteraceae family, wild perennial herb</p>	<p>A decoction of artemisia is used for respiratory colds, anemia, rheumatism, bronchial asthma and insomnia, invigorates the work of the gastrointestinal tract, increases bile secretion and pancreatic function, and improves digestion. Kills harmful bacteria and fungi contained in food, stimulates the central nervous system and restores heart function, artemisia tincture is also a great help in nervous diseases.</p>
<p>3. Alhagi - a genus of perennial weeds belonging to the legume family.</p>	<p>A decoction (sometimes also a tincture) made from the root of the alhagi root is used to treat hemorrhoids and wounds, to stop bleeding from the stomach (bloody diarrhea) and liver, gastrointestinal ulcer, a tincture made from the body of the alhagi root is used in the above-mentioned diseases and angina, tonsillitis, stomatitis, purulent otitis, nasopharyngitis, uterine ulcer, and as an expectorant, it is also used in the treatment of diarrhea and gastrointestinal diseases.</p>
<p>4. Zizifora – Lamiaceae family, wild herbaceous perennial plant – latin name Ziziphora)-</p>	<p>Angina, myocarditis, a mild form of hypertension, difficulty urinating, chronic nephritis, the tincture is used to reduce the cardiovascular system, arterial blood pressure, urinary tract, in the treatment of liver diseases, especially in the effective treatment of jaundice and hepatitis, when it is difficult to pass sputum, to lower blood pressure, to calm the nerves. , it is used for children with complications of rheumatism, for adults with neurosis, neurasthenia and vascular diseases, when blood pressure increases.</p>
<p>5. Herba bursae pastoris – Brassicaceae family, annual herb</p>	<p>Herba bursae pastoris is used in gynecological practice in the form of a tincture and extract as a postpartum hemostatic agent, as well as to strengthen the contraction of the uterine muscles during childbirth. In the treatment of pulmonary tuberculosis with frequent hemoptysis and bleeding, herba bursae pastoris has been found to be effective. In early spring, young leaves are used to boost immunity and refresh.</p>
<p>6. Plantago- Plantaginaceae family, a large perennial wild and cultivated herb (Plantago major L.)</p>	<p>Medicinal plant Plantago is used as an expectorant, anti-inflammatory, in the treatment of gastrointestinal tract diseases (hypoacidity, enteritis, colitis, duodenal ulcer) and in the treatment of upper respiratory tract infections with cough.</p>

<p>7. Harmalae-Nitrariaceae family, is a perennial herb.</p>	<p>Harmalae for medical purposes, less frankincense seeds, often the herb, are used. Deoxypeganine hydrochloride has anticholinesterase properties and is used in the treatment of various forms of myopathy and myasthenia, chronic constipation, intestinal atony, epidemic encephalitis, tick paralysis and Parkinson's disease from garmin contained in frankincense seeds. , used as an anthelmintic, antiseptic, diaphoretic and diuretic.</p>
<p>8. <i>Cichorium intybus</i> - (<i>Cichorium intybus</i> L.) Asteraceae family, Perennial plant with erect and thick roots.</p>	<p><i>Cichorium intybus</i> is a valuable medicinal plant that has been popular in folk medicine for a long time. Burdock root was used in ancient Rome to improve digestion, and in Egypt it was used to make anti-venom for snake and spider bites. The famous Abu Ali ibn Sina was used in the treatment of gastrointestinal tract and eye diseases, inflammation of the eyes and gout. In modern medicine, sage has a wide range of uses due to its beneficial medicinal properties (sedative, hypoglycemic, astringent, expectorant, diuretic, anti-inflammatory, antipyretic, anthelmintic).</p>
<p>9. <i>Taraxacum</i> -- (<i>Taraxacum officinale</i> L.) Asteraceae Compositae family, perennial herb medicinal plant</p>	<p><i>Taraxacum</i> is the best remedy for liver disease, anacid gastritis caused by constipation, gall bladder disease, bile, diuretic, appetite suppressant, blood purifier, suppurative, and gastritis, gout, and skin diseases that develop due to lack of hydrochloric acid in the stomach. Tincture is used in place of a sedative, and the juice of freshly cut leaves is the best remedy for anemia, impotence, and pain in the chest area. A green salad prepared from it refreshes a person and increases his ability to work.</p>
<p>10. <i>Helichrusum maracandicum</i>- is a perennial medicinal plant.</p>	<p>The flowers of the <i>Helichrusum maracandicum</i> are considered gardeners. It is a choleric plant for liver pain, jaundice, gallstone disease, kidney stone disease, asthma, pulmonary tuberculosis, tuberculosis, hemostatic, worm driver (especially ascarida), anti-cold medicinal plant. In scientific medical practice, it is called boznoch. In particular, decoction and tincture made from the flowers of <i>Helichrusum maracandicum</i>, liquid extract is used as a bile-driving factor in liver diseases.</p>



<p>11. Common yarrow - (<i>Achillea millefolium</i> L.) Perennial grass with feathery leaves belonging to the family of the family of sedges.</p>	<p>Common yarrow - extract and tincture are used for the treatment of gastric and intestinal ulcer diseases, to increase appetite and to stop bleeding.</p>
<p>12. <i>Salvia</i> (<i>Salvia officinalis</i> L.,) Lamiaceae family, biennial or perennial herb</p>	<p><i>Salvia</i> is used in medicine for polyarthritis, osteomyelitis, deforming arthrosis, and trophic ulcers. After extracting the essential oil, the remaining raw material mass is used for therapeutic rheumatic baths. <i>Salvia</i> has antibacterial properties. Coumarins in the root have antitumor effects. In <i>salvia</i> folk medicine, it is used for urinary stone disease, rheumatism, and tachycardia, a decoction of the ground part with milk is used as an antipyretic, as well as an aromatic and digestive aid. In skin diseases, <i>salvia</i> oil is used externally by massaging. It is used for dysentery, purulent diseases, thrush, hair loss.</p>
<p>13. <i>Capparis</i>– <i>Capparaceae</i> family perennial plant</p>	<p>The extract from the <i>capparis</i> is a part of the complex drug LIV-52, manufactured in India and approved in medical practice. It is released in the form of tablets and is prescribed for liver disease. Fresh parts of the plant have astringent, diuretic, antiseptic and analgesic properties. Juice wounds, root bark is chewed for toothache. In folk medicine, the fruits of the gourd are used in the treatment of toothache, gum disease, thyroid gland, and hemorrhoids. The bark of the crushed roots is used for gout and brucellosis. Tincture of root bark is used in angina pectoris, nervous seizures, paralysis, rheumatic pains with colds, spleen diseases, liver diseases, including jaundice.</p>
<p>14. <i>Ferula</i>-<i>Ferula celeriac</i> (<i>umbelliferae</i>) - belongs to the <i>Apiaceae</i> (<i>Umbelliferae</i>) family and is a perennial herb</p>	<p><i>Ferula</i>-hepatitis disease, adding pepper and vinegar to its paste and applying it to bad quality wounds is beneficial. Hair loss, gum-resin tuberculosis, plague, wounds, whooping cough, toothache, nervine tonic, expectorant and dewormer, gum-resin as a powder, emulsion and tincture as pain reliever, used in health as an expectorant, tonic and sedative.</p>

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## METABOLIC DISORDERS IN THE ACUTE PERIOD OF COVID-19

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<https://doi.org/10.5281/zenodo.8125237>

**Abstract.** *The article presents the results of studying the features of metabolic disorders in patients with COVID-19 in the acute phase of the disease. The study used data of 31 patients in the acute period of coronavirus infection caused by COVID-19. The average age of patients was  $56.4 \pm 12.8$  years (from 32 to 80 years), among them 13 (41.9%) were men and 18 (58.1%) were women.*

*The data obtained indicate that obesity and dyslipidemia, in particular, high lipid levels are more common in patients with a moderate disease course. But at the same time, some metabolic disorders are also 1.2-1.6 times more common in patients with a moderate course of coronavirus infection compared with a mild course (respectively, blood pressure  $\geq 140/90$  mmHg: 23.5% vs. 14.3%; TG  $\geq 1.7$  mmol/L: 47.1% vs. 28.6%; HDL  $< 1.0$  mmol/L: 64.7 vs. 28.6%; fasting glucose  $\geq 6.1$  mmol/L: 35.3% vs. 28.6%).*

**Keywords:** *coronavirus, COVID-19, carbohydrate metabolism, lipid metabolism.*

Metabolic syndrome (MS) is a cluster of cardiovascular disorders, including abdominal obesity, high blood pressure, impaired glycemia, dyslipidemia, which are based on insulin resistance (IR) and compensatory hyperinsulinemia [1; 2].

According to various data, on average from 20 to 30% of the adult population in most countries suffer from MS [3; 4]. However, the range of MS prevalence varies significantly depending on the geographical region, the developmental level of the country and diagnostic criteria. For example, data on MS frequency in 10 European countries accounted for 24.3% (23.9% for men and 24.6% for women;  $p < 0.001$ ) [5], in Turkey - 27.21% [6], in Bangladesh - 30.0% [7], in Korea - 30.52% [8], in Iran - from 13 to 37%. The prevalence of MS in the USA increased from 32.5% (2011-2012y.) to 36.9% (2015-2016y.). According to Russian data, the incidence of MS among men aged 40-55 is 44.4%, among women — 20.8% for same age group [9].

Nowadays, complications developed after the coronavirus disease in 2019 (COVID-19) represent a global problem [10; 11]. According to official statistics, 679503595 COVID-19 infection reported cases were registered throughout the world on February 25, 2023, and 250932 cases in Uzbekistan.

Although the pathophysiological mechanisms have not yet been studied, it has been observed that in most infected people the prognosis is favorable, chronic diseases usually observed in the elderly (hypertension, diabetes mellitus, cerebral vascular diseases and their predisposition states) can lead to serious clinical outcomes during prepandemia [12; 13].

In this context, MS is introduced as a common denominator of these concomitant diseases, since it is defined as a set of metabolic disorders, including insulin resistance, dyslipidemia, central obesity and hypertension, which are risk factors for the development of type 2 diabetes and cardiovascular diseases [14; 15].

Components of the metabolic syndrome, such as hypertension, type 2 diabetes and obesity, are widespread and significantly increase the risk of hospitalization and mortality in COVID-19 infected patients [16].

**The aim of a research study** was to determine the features of metabolic disorders in COVID-19 infected patients in the acute phase of the disease course.

#### **Materials and methods.**

The object of research were 31 patients in the acute period of coronavirus infection caused by COVID-19. The research study was conducted on the basis of the Republican Specialized Multidisciplinary Hospital "Zangiota-1" and the Republican Specialized Scientific and Practical Medical Center of Endocrinology.

The diagnosis of COVID-19 was made in accordance with the clinical course of the disease, the results of computed tomography (CT scan) of the lungs at admission, as well as a positive PCR test for SARS-CoV-2. The age of the patients ranged from 32 to 80 years (mean age was  $56.4 \pm 12.8$  years). There were 13 (41.9%) male and 18 (58.1%) female patients. More than half of the patients (58.1%) were between 50 and 70 years old.

All patients underwent standard clinical and anamnestic examinations: anthropometric (height, body weight, calculation of body mass index (BMI)); hemodynamic (blood pressure (BP) and heart rate); laboratory examination included general and biochemical blood analysis - liver function tests (alanine aminotransferase (ALT) and aspartate aminotransferase (AST), bilirubin), coagulogram, lipid spectrum indicators (total cholesterol (TC), triglycerides (TG), high-density lipoproteins (HDL), low-density lipoproteins (LDL)), as well as fasting blood glucose levels, HbA1c, fasting insulin, with determination of HOMA-IR index, urea, creatinine with GFR calculation and C-reactive protein.

The blood lipid spectrum examination was carried out by photometric method using reagent kits by the company "Human" (Germany). Glucose determination test was carried out by the glucose oxidase method using kits by the company "Human" (Germany). Glycosylated hemoglobin (HbA1c) was determined by the turbidimetric method with a set of reagents by the company "Human" (Germany). The insulin level was determined by electrochemiluminescence (ECL) method on an Elecsys and tobas immunochemical analyzer using standard sets of Cobas Roche (Germany).

The HOMA IR insulin resistance index was calculated using the formula:  $\text{HOMA-IR} = \text{fasting insulin} * \text{fasting glucose} / 22.5$ . Insulin resistance was established when  $\text{HOMA-IR} > 2.5$ .

Statistical processing of the results was carried out using the SPSS Statistics 23 program. The initial data were evaluated for compliance with the normal distribution according to the Kolmogorov-Smirnov criterion. The results are presented as median (Me) [interquartile range Q25; Q75]. The differences were considered statistically significant at  $p < 0.05$ .

#### **Research results and their discussion**

More than half (58.1%) of the patients had a combined concomitant pathology. Concomitant pathologies are arterial hypertension (51.6%), obesity (45.2%), respiratory system diseases (19.4%), diabetes mellitus (12.9%), chronic kidney diseases (12.9%), GIT diseases (11.3%). In a cohort study, the COVID-19 course was mild (45.2%) and moderate (54.8%). The main complaints included weakness (51.6%), cough (45.2%), increased blood pressure (35.5%), excessive sweating (32.3%), shortness of breath and a feeling of lack of air (29.0%), joint pain (25.8%).

The average age of patients was  $56.4 \pm 12.8$  years, BMI –  $30.0 \pm 5.3$  kg/m<sup>2</sup> (Table 1).

During the analysis, it was found that 35.5% of patients are overweight, and 45.2% are obese. The average indicators of SBP and DBP exceed the normal values, while the level of SBP  $\geq 130$  mmHg and DBP  $\geq 70$  mmHg is found in 51.6% and 64.5% of cases, respectively.

Table 1

Hemodynamic and biochemical parameters of coronavirus infected patients in the acute period of disease course

Test results	Me; Q25; Q75	Test results	Me; Q25; Q75
Age, years old	60,0; 46,5-66,5	ALT, Units/l	22,9; 18,2-32,1
BMI, kg/m <sup>2</sup>	29,4; 27,5-33,8	AST, Units/l	23,6; 20,1-29
SBP, mm Hg.	130,0; 110,0-140	Bilirubin, $\mu$ mol/l	16,7; 12,3-20,3
DBP, mmHg.	80,0; 70,0-100	Urea, mmol/l	5,6; 4,8-7,0
Heart rate, beats/min	82,0; 77,0-89,5	Creatinine, mmol/l	78,4; 72,9-94,9
CRP, mg/l	65,4; 55,7-77,1	GFR, ml/min/ <sup>1.73m2</sup>	95,7; 81,1-111,8

BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; HR, heart rate; CRP, C-reactive protein; ALT, alanine aminotransferase; AST, aspartate aminotransferase; GFR, glomerular filtration rate.

In all patients, the CRP level was significantly higher than the reference values (0-5 mg/l). ALT and AST levels above the reference values were observed in 16.1% and 9.7% of patients, respectively.

Using data mining, Jiang X. et al. [17] revealed that a slightly elevated level of the liver enzyme alanine aminotransferase is the most prognostic clinical biomarker in newly infected patients with SARS-CoV-2 for the subsequent development of acute respiratory distress syndrome (ARDS). A number of meta-analyses note that abnormally high levels of hepatic aminotransferases (ALT and AST) are more common in severe cases of COVID-19 [18; 19; 20]. These results are crucial because liver diseases are very closely associated with MS, prediabetes and DM.

To assess the filtration capacity of the kidneys, urea, creatinine and GFR levels were analyzed. On average, these indicators were increased, but within the reference values. Calculated GFR data indicate a slight (GFR 60-89 ml/min) decrease in kidney function in 25.8% of patients during the acute period of coronavirus infection.

According to the literature, blood clotting dysfunction may be one of the important problems in patients with COVID-19. The analysis of clinical and laboratory data on COVID-19 showed that patients with severe disease course often had PTT prolongation, elevated D-dimer levels, low fibrinogen levels and DIC syndrome [21; 22; 23].

Coagulation dysfunction is noted in patients who have had a coronavirus infection. The mechanism of hypercoagulation is presumably associated with pronounced endothelial dysfunction and induction of platelet aggregation (the endothelium contains APF2 receptors, that is a target for the virus) [24].

In general, the coagulogram test results were within the reference values (Table 2).

Table 2

Coagulogram test results of coronavirus infected patients in the acute period of disease course

Test results	Me; Q25; Q75	Test results	Me; Q25; Q75
PTI, %	115,0; 108,8-123,5	Fibrinogen, g/l	5,1; 4,5-5,8
INR	0,9; 0,8-1,0	PTT, sec	9,9; 9,4-12,0
APTT, sec	24,0; 21,9-25,5	TT, sec	18,3; 17,5-20,3

PTI, prothrombin index; INR, International Normalized Ratio; APTT, activated partial thromboplastin time; PTT, prothrombin time; TT, thrombin time,

However, in 16.1% of patients, the level of fibrinogen and in 22.6% of patients, PTT did not significantly exceed the upper limit of the reference range. Moreover, most of them have carbohydrate metabolism disorder and are overweight or obese.

Carbohydrate metabolism disorder such as increased fasting glucose levels was detected in 6 (19.4%) patients, especially older than 50 years with concomitant hypertension, overweight and obesity. In 4 patients with a history of type 2 diabetes, the duration of the disease averaged  $6.8 \pm 1.7$  years.

In most patients, fasting glucose levels were in the range of normal values (on average  $4.4 \pm 0.7$  mmol/L). The HbA1c index above the reference interval was observed in 32.3% of patients. Figure 1 shows the distribution of patients depending on the indicators of carbohydrate metabolism.

When analyzing insulin resistance parameters, elevated insulin levels were noted in 22.6% of cases, HOMA IR  $\geq 2.7$  was found in 35.5% of patients, predominantly with moderate coronavirus infection course.

On average, the indicators of lipid metabolism were within the reference limits (TC-  $4.33 \pm 1.31$  mmol/l; TG -  $2.0 \pm 1.06$  mmol/l; HDL -  $1.09 \pm 0.33$  mmol/l; LDL -  $2.56 \pm 0.83$  mmol/L).

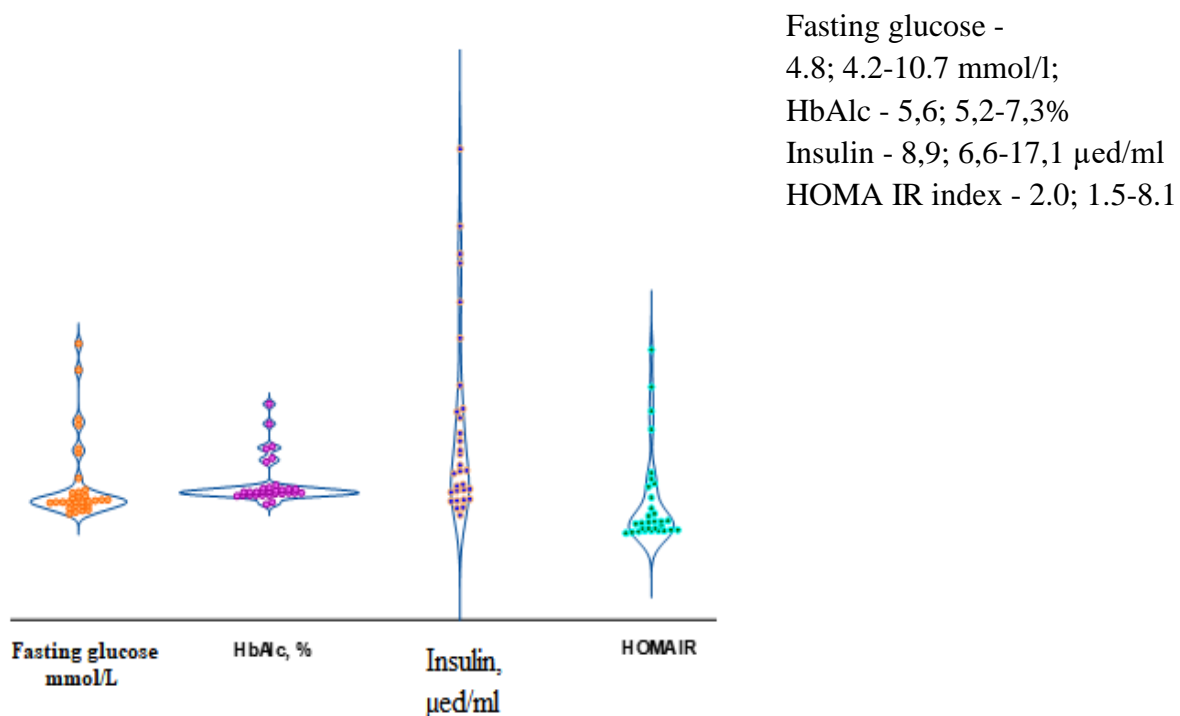
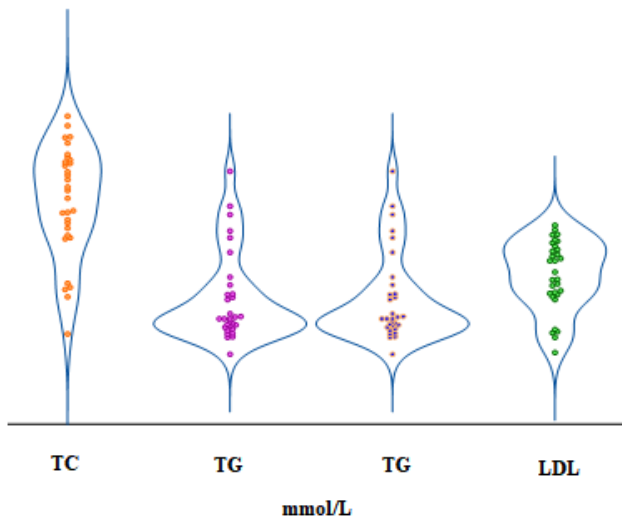


Fig. 1. Indicators of carbohydrate metabolism in patients in the acute period of COVID-19

Figure 2 shows the distribution of patients depending on the parameters of lipid metabolism.



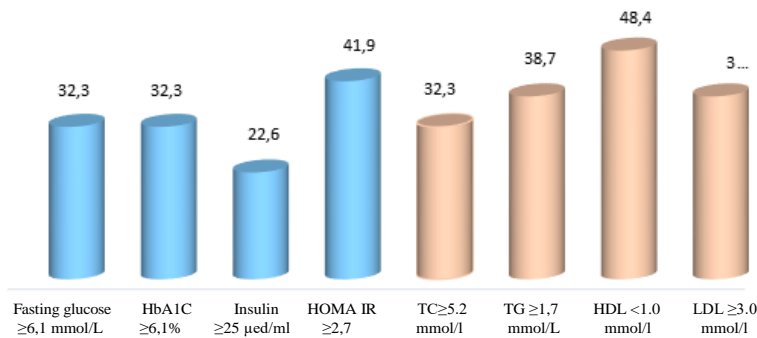


TC- 4.58; 3.6-5.28 mmol/l  
TG - 1.53; 1.34-2.23 mmol/l  
HDL - 1.15; 0.91-1.29 mmol/l  
LDL - 2.64;2.12-3.22 mmol/l

TC, total cholesterol; TG,  
triglycerides; HDL, high-density  
lipoproteins, LDL, low-density  
lipoproteins

Fig. 2. Lipid spectrum in patients in the acute period of COVID-19

Nevertheless, the proportion of patients with the level of TC $\geq$ 5.2 mmol/l was 32.3%, TG  $\geq$ 1.7 mmol/l - 38.7% and LDL  $\geq$ 3.0 mmol/l - 38.7%. The frequency of HDL <1.00 mmol/l was also significant – 48.4% (Fig. 3.).

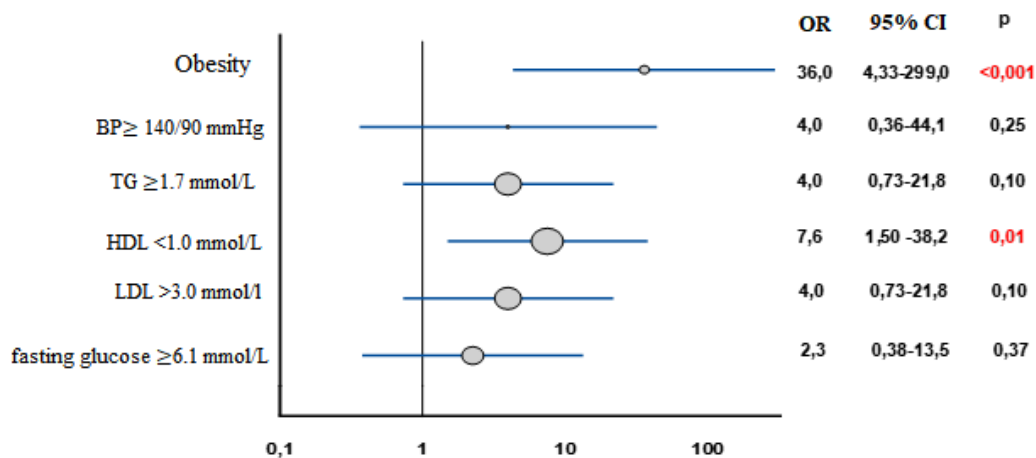


TC, total cholesterol; TG, triglycerides; HDL, high-density lipoproteins,  
 LDL, low-density lipoproteins

Fig. 3. The frequency of occurrence of metabolic profile parameters differing from the reference values

It should be noted that this cohort study included patients with a moderate form of COVID-19 with concomitant pathologies such as overweight and obesity, arterial hypertension and impaired carbohydrate metabolism.

Next, we analyzed the frequency of occurrence of metabolic disorders depending on the severity of COVID-19 (Fig. 3.).



BP, blood pressure; TG, triglycerides; HDL, high-density lipoproteins, LDL, low-density lipoproteins

Fig.4. Comparative analysis of metabolic syndrome components incidence depending on the severity of coronavirus infection.

The data obtained indicate that obesity and LDL levels >3.0 mmol/l are significantly more common in the group with a moderate course of the disease course.

Moreover, other metabolic disorders are also 1.2-1.6 times more common in the group with a moderate course of coronavirus infection compared with a mild course (respectively, blood pressure  $\geq$  140/90 mmHg: 23.5% vs. 14.3%; TG  $\geq$ 1.7 mmol/L: 47.1% vs. 28.6%; HDL <1.0 mmol/L: 64.7 vs. 28.6%; fasting glucose  $\geq$ 6.1 mmol/L: 35.3% vs. 28.6%).

### **Conclusion**

Thus, the presence of metabolic disorders, such as obesity, hypertension, dyslipidemia, impaired carbohydrate metabolism, are associated with a more severe course of coronavirus infection disease. At the time of admission, there were more combined underlying diseases in the group with a moderate course of coronavirus infection than in patients in the group with a mild course.

**Conflict of Interest:** The author declares that there is no conflict of interest regarding the study.

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# MOLECULAR AND GENETIC FEATURES OF SQUAMOUS CELL CARCINOMA OF VULVAR CANCER DEPENDING ON HPV STATUS

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<https://doi.org/10.5281/zenodo.8137492>

**Abstract.** *The study included materials from 76 operations (110 paraffin blocks) that were not treated with neoadjuvant treatments, since preoperative exposure to tumors could significantly affect the results of the study, which is why these samples were not included in the study. It was found that the high viral load of HPV in RV correlates with the presence of metastases to the lymph nodes, invasion of the stroma, the degree of differentiation, as well as lymphovascular invasion, while it is in no way related to the stage of the disease. PD-L1 receptor expression is more often observed in HPV negative RV patients compared to HPV positive ones (7.8 vs. 3.7 p=0.03), while HPV positive patients were more likely to have STK11 mutation. At the same time, the PIK3CAE545 mutation occurred with the same frequency between the two groups of RV patients.*

**Keywords:** *mutation, signaling pathway, epigene, apoptosis receptor, cell cycle, transcription.*

**Introduction.** According to WHO, over the past few decades, there has been a rejuvenation of the Russian Federation, in the direction of its increase among young women. Due to the variety of symptoms of vulvar cancer and a wide range of benign diseases of this localization, it is still difficult to diagnose, especially in the early stages. In addition, most of the research in the field of vulvar cancer is currently focused on innovative treatment regimens, including biological agents and immunotherapy, which require a deep understanding of the basic molecular mechanisms involved in the pathogenesis of RV, and the issues of developing new schemes of combined and complex therapy are an urgent area of research in modern oncology [1,2,3,4]. With the discovery and identification of new prognostic biomarkers, approaches to the treatment of vulvar cancer will change from standard radical resections to personalized approaches. Since the identification of new prognostic variables can lead to further individualization of vulvar cancer treatment, research in the search for new biomarkers is an urgent area of modern oncology [5,6,7].

**Materials and methods.** We examined the materials of 76 operations (110 paraffin blocks) for which neoadjuvant treatments were not performed, since preoperative exposure to tumors could significantly affect the results of the study, which is why these samples were not included in the study. Before the molecular and IHC examination, all tissue samples were reviewed by experienced pathologists. Clinical data were obtained from patients and their medical records, after approval by the ethics committee. The pathoanatomic diagnosis was confirmed on the basis of a study of histological sections stained with hematoxylin and eosin. The sections were subjected to major dissection as needed to achieve >20% of the calculated percentage of the nucleus in each tumor sample. From 2210 formalin-fixed tumor samples from tissue paraffin blocks, 40 microns sections,  $\geq 60$  ng of DNA were excised for genomic analysis. The materials were analyzed using CGP using adapter binding, and using hybrid capture. All sequences of genomic change were

sequentially analyzed, including small variants of changes, changes in the number of copies, as well as fusion and rearrangement of genes.

The mutational load of the tumor (TVM; mutations/Mb) was determined on 0.8 – 1.1 megabase pairs of sequenced DNA. Microsatellite instability (MSI) was determined by 114 loci. Mutation tags were evaluated for all tumor samples. When the tumor sample had at least 40% compliance with the mutation process, including overexpression of ARES, hypofunction of the BRCA tumor suppressor and in the presence of a defect of repair compliance, the mutation label was considered positive.

An immunohistochemical study was performed with the determination of ligand 1 of programmed cell death (PD-L1) mandatory with CGP, for the selection of patients for immunotherapy. PD-L1 protein expression was determined on 5–micron tissue slices using a DakoPD-L1 IHC22C3 pharmDx analyzer (Agilent, Santa Clara, California) or Ventana (Oro Valley, Arizona) in accordance with the instructions of each manufacturer. Ventana PD-L1 expression is expressed as a percentage of the tumor area positively stained by tumor and immune cells, and DakoPD-L1 as an indicator of the tumor fraction. Staining of tissue samples of less than 1% was evaluated as a negative result, up to 49% as weakly positive and 50% or more percent staining as a positive result [1,6,7,8]. Total RNA was extracted from frozen tissue by microdissection. RNA was extracted from the cut and lysed tissues using the RNeasy Mini Kit (QIAGEN) and Precellys according to the manufacturer's instructions. DNA precipitates were incubated for 18 hours from the beginning of tissue lysis at a temperature of 55°C using a cell lysis solution. The resulting mass was centrifuged and phenol – chloroform – isoamyl alcohol was added, which was alternated with glycogen 20 mg/ml. The alcohol was removed, the samples were dried after washing in distilled water. After assessing the quantity and quality of DNA and RNA samples, further analysis was carried out (a detailed description of isolation, molecular and IHC analysis can be found in special literature).

**Results.** As in the general group, squamous cell carcinoma (56.9%) and intraepithelial neoplasia (27.9%) were most often diagnosed.

We also conducted a correlation study of the relationship between human papillomavirus and the genetic profile of vulvar cancer. Staining of ligand 1 of apoptosis (PD-L1) of squamous cell carcinoma of the vulva, with a negative result for human papillomavirus, showed a higher incidence of this ligand, whereas with positive HPV, the occurrence of PD-L1 was significantly low.

Although the median TVM for HPV+ in squamous cell vulvar cancer was generally higher than the HPV result (7.8 vs. 3.7;  $p=0.03$ ), a complicating factor was a higher percentage of HPV-squamous cell vulvar cancer sequenced from the primary tumor. STK11 at HPV+ was significantly higher than HPV-test results. When comparing the mutation frequency between groups with positive and negative HPV for squamous cell vulvar cancer (PRV), a difference in mutations between HPV+ and HPV tumors was observed. Most CCND1-amplified PRVs have demonstrated amplification of other genes, such as, in 11q13, including FGF3, FGF4 and FGF19. The main specific point mutation with a significant difference between HPV+ and HPV-tumors, which was saturated with the activating mutation PIK3CAE545K. Thus, this study showed that the presence or absence of human papillomavirus dramatically affects tumor differentiation. With a positive test for human papillomavirus, mutations in the PI3K/mTOR pathway increased, on the contrary, with a negative test, GA was more often determined in TP53, TERTp, CDKN2A, CCND1, FAT1,



NOTCH1, EGFR.

The status and type of HPV were determined in all samples of 186 patients. 86 patients out of 186 had HPV, mainly type 16 and type 18. The HPV+ result was mainly found in patients of younger age than in the group of elderly patients. 86 patients (46.2%) were infected with HPV, of which 23.3% had an extremely small infection, 31.4% had a clinically significant lesion in the material, and 45.3% had a high viral load. The viral load does not depend on the stage of the disease, but such indicators as the presence of metastases in the lymph nodes, invasion of the stroma, tumor gradation, lymphovascular and vascular invasion had a natural connection with viral invasion. In the presence of metastases to the lymph nodes, HPV infection was detected in all 61 cases (100%), in the presence of distant metastases in 94.1%, with G3 – 87.5%, lymphovascular and vascular invasion 94.4 and 92.6%, respectively ( $p=0.95$ ).

In our study, among patients with vulvar cancer, the greatest number of viral lesions were observed in younger patients, whereas, in elderly patients, vulvar cancer was the result of degenerative – dystrophic changes in the vulva area.

Of the 86 patients with positive HPV, 76 (88.4%) patients were under the age of 60. At the same time, among patients with vulvar cancer under 40 years of age, about 82%, up to 50 to 93% of cases of infection with human papillomavirus. Among the patients in the age group up to 60 years, 32 patients infected with the human papillomavirus were under 55 years old. If this fact is taken into account, 76.7% of patients with HPV were under the age of 55. As in the general group, squamous cell carcinoma (56.9%) and intraepithelial neoplasia (27.9%) were most often diagnosed. Although the median TVM for HPV+ in squamous cell vulvar cancer was generally higher than the HPV result (7.8 vs. 3.7;  $p=0.03$ ), a complicating factor was a higher percentage of HPV-squamous cell vulvar cancer sequenced from the primary tumor. STK11 at HPV+ was significantly higher than HPV-test results. When comparing the mutation frequency between groups with positive and negative HPV for squamous cell vulvar cancer (PRV), a difference in mutations between HPV+ and HPV tumors was observed. Most CCND1-amplified PRVs have demonstrated amplification of other genes, such as, in 11q13, including FGF3, FGF4 and FGF19. The main specific point mutation with a significant difference between HPV+ and HPV-tumors, which was saturated with the activating mutation PIK3CAE545K.

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## THE ROLE OF UN INTERNATIONAL INSTRUMENTS IN THE FIELD OF ECOLOGY

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<https://doi.org/10.5281/zenodo.8146073>

**Abstract.** *This article analyzes the features of the international legal activities of the United Nations to ensure international cooperation for the protection of the natural environment. The author notes that the UN is important in the framework of international cooperation and allows countries to consolidate their efforts to overcome the consequences of environmental problems.*

**Keywords:** *international law, ecology, politics, economics, global problems, cooperation of states.*

Today, environmental protection is becoming the most urgent problem for all mankind. Environmental problems concern all countries of the world, without exception.

Negative environmental change on our planet has become a global problem on a global scale, in which all countries should participate. The human impact on the environment has reached an excessively high level. This has led to the fact that there are practically no natural ecological systems left on the planet. In addition, many international and national environmental problems are caused by transboundary anthropogenic impact on the environment, which makes such a solution possible only thanks to the combined efforts of all States.

The need for international cooperation in the field of environmental protection is also exacerbated by the concern of the world community about global environmental problems, some of which are related to the protection of natural objects beyond the limits of national jurisdiction, such as climate change, ozone depletion, environmental pollution, pollution of ocean waters, etc..

International cooperation in the field of environmental protection plays an important role in ensuring the environmental safety of the country; improvement of international environmental law; harmonization of legislation, national and international procedures, criteria and standards for environmental quality assessment; development of an international standardization system; countering environmental terrorism. For the international community, nature conservation is one of the most important tasks that must be solved to protect the environmental interests of not only today, but also future generations. That is why international cooperation in the field of environmental protection is an independent block of active foreign policy activity of any state.

Therefore, international consolidation is important for solving environmental problems. It is in this part that the activities of the United Nations are of particular importance.

In 1972, following the results of the UN Conference on the Problems of the Human Environment, a Declaration of the same name was adopted, which proclaimed the postulate that:

*"Man is a creation and at the same time the creator of his environment, which ensures his physical existence and provides him with opportunities for intellectual, moral, social and spiritual development. During the long and painful evolution of mankind on our planet, a stage was reached at which, as a result of the accelerated development of science and technology, man acquired the ability to transform his environment in numerous ways and on a scale hitherto unseen. Both aspects of the human environment, both natural and man-made, are crucial for his well-being and for the exercise of basic human rights, including even the right to life itself."*

In 1983, the UN created the World Commission on Environment and Development. As a result of the work of this commission, the report "Our Common Future" was published, which urged that all human activities be carried out in accordance with the principles of sustainable development, which was defined as development that allows meeting the needs of the current generation without compromising the ability of future generations to meet their own needs. Issues of environmental well-being affect a whole layer of relations (political, economic, social, humanitarian), but at the same time, it is legal relations that are of key importance, since environmental standards established by states, international organizations, and communities should be considered as "jus cogens" norms, since the well-being of all mankind depends on their implementation.

The role of the UN is related to international cooperation. Cooperation in the field of environmental protection on an international scale is of great importance in the light of modern environmental problems that our planet is facing. In our opinion, there are the following key aspects that emphasize the importance of such cooperation:

1. **The global nature of the problems.** Many environmental problems, such as climate change, loss of biodiversity, air and water pollution, are not limited to national borders. They are global in nature and require coordinated efforts of all countries to solve them. Without international cooperation, it is impossible to achieve significant results in the fight against such global problems.

2. **Resources and expertise.** Different countries have different resources and expertise in the field of environmental protection. Cooperation makes it possible to combine these resources and expertise to effectively solve environmental problems. Collective efforts can lead to the development of new technologies, methods and approaches that can be used for sustainable development.

3. **Solidarity and responsibility.** The environment is the common heritage of all mankind, and all countries are responsible for its preservation. International cooperation allows countries to express their solidarity and cooperation in solving environmental problems. Joint efforts create a stronger and more influential voice in international negotiations and actions.

4. **Information exchange and knowledge transfer.** International cooperation allows the exchange of information and the transfer of knowledge between countries. Each country can have its own unique experience and approaches to environmental protection, and the exchange of this information allows us to learn from best practices and avoid repeating mistakes. This contributes to raising the general level of awareness and competence in the field of environmental protection.

5. **Protection of the rights of future generations.** Cooperation in the field of environmental protection on an international scale is aimed at protecting future generations. Environmental problems can have long-term consequences that affect not only the current generation, but also the future. Only through joint efforts can we ensure a sustainable and prosperous future for all people.

In general, international cooperation in the field of environmental protection is a key factor in achieving sustainable development and preserving natural resources for future generations. Only by combining efforts and resources can we overcome global environmental challenges and ensure a viable future for our planet.

The next important activity of the UN is international norm-setting. International UN environmental instruments play an important role in the formation and development of global

standards and policies for sustainable development and environmental protection. Below are some of the main roles of UN international instruments in this area:

a) **development of international norms and standards** – the UN develops and adopts international treaties, resolutions and recommendations aimed at establishing universally recognized norms and standards in the field of ecology. Examples of such acts are the UN Framework Convention on Climate Change (UNFCCC), the UN Convention on Biological Diversity (CBD) and the Kyoto Protocol.

b) **promoting cooperation between States** – The UN promotes cooperation between States in the field of ecology by organizing international conferences, meetings and forums (such events allow countries to exchange information, transfer best practices and coordinate actions to solve global environmental problems);

c) **Support for sustainable development** – the UN develops and promotes programs and initiatives aimed at promoting sustainable development (for example, the Sustainable Development Goals (SDGs) approved by the UN General Assembly include environmental aspects such as combating climate change, protecting water resources, protecting ecosystems and sustainable use of natural resources);

d) **Monitoring and assessment** – The UN monitors and assesses the state of the environment at the global level (for example, the UN Environment Programme (UNEP) regularly publishes reports on the state of the environment, which analyzes global environmental trends and problems);

e) **Assistance in solving environmental problems** – The UN provides assistance and expert opinion to countries in solving environmental problems, which may include technical assistance, training, project financing and technological transfer to support sustainable development and combat environmental challenges.

International UN environmental instruments create a legal framework and ensure international coordination and cooperation to achieve sustainable development and environmental protection at the global level. They contribute to the formation of coordinated strategies and actions of all States to cope with environmental problems, including climate change, loss of biodiversity and environmental pollution.

The international community is concerned about the deterioration of the ecological situation on the planet. Thus, at the UN Climate Conference in Paris (2015), which is not inferior in importance to the Kyoto One (1997), 195 states participated and an agreement on limiting greenhouse gas emissions was signed.

The modern system of international cooperation unites the following areas:

holding international environmental conferences and forums, within the framework of which representatives of different countries develop and adopt programs containing specific goals that allow implementing the concept of sustainable development and monitoring their achievement;

conventional regulation of environmental activities through the conclusion of contracts and other types of international agreements, involving the implementation of a unified approach of different countries to solving specific problems;

inter-parliamentary cooperation, as a result of which model laws are developed and legislative activities are coordinated;

interaction of executive authorities of individual states;

scientific and technical cooperation aimed at developing the latest technologies to minimize anthropogenic impact and rational use of natural resources;

interaction of public organizations, business circles, etc.

Within the framework of international cooperation, a number of economic mechanisms have been developed to prevent or compensate for the negative consequences of global environmental changes as a result of anthropogenic activities. For example, the creation of special funds. Such an international independent financial entity is the Global Environment Facility (GEF), established in 1991. Its activities are implemented through the UN Development Program, the UN Environment Program and the World Bank. It provides grants to developing countries and countries with economies in transition aimed at improving the state of the environment.

An example of financial mechanisms is the so-called "debt-nature exchange" - a variant of the transformation of national debts, which was proposed by the creditor countries of the Paris Club in 1990. It boils down to the fact that the creditor (an individual country, groups of countries, transnational corporations, international non-governmental organizations) agrees with the debtor country on an agreement, according to the terms of which the creditor forgives the debt or part of it in exchange for the obligation of the debtor country to allocate funds for environmental protection, to fulfill certain environmental obligations. Among the countries with economies in transition, this mechanism was effectively used by Poland, which thus converted a significant part of its debt to the United States, Switzerland, France and Finland.

In conclusion, it can be noted that there is a direct dependence of economic development on the state of the natural environment. And this dependence increases as scientific and technological progress accelerates, population growth increases, and the volume of irrevocable use of natural resources increases. The peculiarity of environmental problems is due to the fact that they cannot be concentrated on the territory of one country, since sooner or later they will begin to have their direct impact on the ecology of the country next door. It follows from this that it is not enough to improve the legislation and the system of nature management in only one country, it is necessary to promote the development of international cooperation and international legislation, which is designed to regulate by joint efforts the protection of nature and the rational use of natural resources. In this part, it is the UN that is the most important link. In this regard, it seems possible to develop a new and effective international act to consolidate the efforts of the UN member states in the form of a separate convention or an international covenant.

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## THE STUDY OF THE CHARACTERISTICS OF CARDIOMETABOLIC RISKFACTORS IN YOUNG PEOPLE WITH ARTERIAL HYPERTENTION

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<https://doi.org/10.5281/zenodo.8151809>

**Abstract.** *Cardiometabolic risk factors were studied in young patients with arterial hypertension against the background of abdominal obesity. The study involved 54 young patients with arterial hypertension of I-III degree, aged 18-44 years. It was found that the most pronounced cardiometabolic disorders, including changes in carbohydrate and lipid metabolism, were found in the group of young patients with abdominal obesity. In overweight young people, as well as in obese people, cardiometabolic changes can be detected, which makes it possible to diagnose these disorders in a timely manner and implement effective strategies for the primary prevention of cardiovascular and metabolic diseases.*

**Keywords:** *arterial hypertension, young age, abdominal obesity, components of the metabolic syndrome.*

Arterial hypertension (AH) retains its leading position as one of the main causes of death and disability in the population, which is associated both with the prevalence of the disease and the high frequency of its complications, and with the insufficient effectiveness of treatment [4; five]. The situation is complicated by the fact that hypertension is often associated with obesity and DM2, while the prognosis is significantly worse [12].

Data from studies conducted over the past decades have shown that against the background of a high prevalence of hypertension, the prevalence of abdominal obesity significantly increases, especially among young people especially. The degree of risk of hypertension in overweight and obese young people is variable. This indicates the existence of additional prognostic factors for the development of this pathology. Population studies suggest that the overall likelihood of developing hypertension is higher in young males, although gender does not affect the relationship between BMI and elevated BP [8].

A sedentary lifestyle, psychological factors (depression, low self-esteem) and lack of sleep at night also contribute significantly to weight gain. Probably, obesity is the result of the influence of a combination of factors, including genetic ones, that affect the implementation of satiety mechanisms and the rate of metabolic processes [9, 11].

It is known that the metabolic syndrome includes several risk factors for coronary heart disease (CHD), including arterial hypertension, abdominal obesity, dyslipoproteinemia and insulin resistance, often manifested by impaired glucose tolerance. The combination of metabolic syndrome components is due to metabolic and physiological relationships between them, which exacerbates their pathogenicity not only in relation to type 2 diabetes mellitus, but also in relation to coronary artery disease and other diseases caused by atherosclerosis [3, 7, 9, 15]. At the same

time, the development of insulin resistance and associated metabolic disorders is promoted by obesity with a predominant localization of fat in the abdominal cavity - abdominal or android obesity [5, 15].

**The purpose of the study:** to study cardiometabolic risk factors in young patients with arterial hypertension on the background of abdominal obesity.

**Material and research methods.**

We examined 69 young patients with arterial hypertension of I-III degree, aged 18-44 years. All patients were hospitalized in the cardiological department of the State Institution "RSNPMCTiMR" of the Ministry of Health of the Republic of Uzbekistan. The examined patients were divided into 3 study groups: group 1 - metabolically healthy phenotype with normal body weight (body mass index 18.5-24.9 kg/m<sup>2</sup>) - 22 people (age 24.5 [22-31] years; 10 men and 12 women); group 2 - patients with overweight (body mass index  $\geq 25$  kg/m<sup>2</sup>) - 23 people (age 30 [24-36] years; 12 men and 11 women); group 3 - patients with obesity (WC (>94 cm for men and >88 cm for women); body mass index  $\geq 30$  kg / m<sup>2</sup> - 24 people (age 32 [28.5-41] years; 13 men and 11 women) [10].

Waist circumference (WC) (>94 cm for men and >88 cm for women) was considered as the main components of abdominal obesity (AO); overweight (BMI  $\geq 25$  kg/m<sup>2</sup>) and obesity (BMI  $\geq 30$  kg/m<sup>2</sup>).

Inclusion criteria: young age 18–44 years; AG I-III degree.

Exclusion criteria: symptomatic (secondary) hypertension; AH-associated clinical conditions, including stage C4–C5 chronic kidney disease (glomerular filtration rate less than 30 ml/min/m<sup>2</sup>) and/or DM with target organ damage; diffuse connective tissue diseases; acute or chronic diseases in the stage of exacerbation or decompensation; abuse of alcohol and other psychoactive substances; pregnancy, lactation.

All patients were examined with an assessment of waist circumference, calculation of body mass index [11], measurement of blood pressure in accordance with national clinical guidelines [1, 2]. All patients in the presence of a doctor filled out a specially designed questionnaire, which included blocks of questions about hereditary history, smoking, the presence of concomitant diseases, and behavioral factors [12]. At the time of the examination, none of the patients included in the study was taking antihypertensive drugs, as well as drugs that affect carbohydrate and lipid metabolism, on a regular basis.

The criterion for the metabolic syndrome was the deviation of at least one of the listed laboratory parameters: total cholesterol  $\leq 5$  mmol/l; triglycerides  $\leq 1.7$  mmol/l; high-density lipoprotein cholesterol (HDL-C)  $\geq 1.0$  mmol/l in men and  $\geq 1.2$  mmol/l in women; low-density lipoprotein cholesterol (LDL-C)  $\leq 3$  mmol/l; HOMA-IR insulin resistance index (Homeostasis Model Assessment of Insulin Resistance)  $\leq 2.8$  [10].

Statistical processing was carried out using Microsoft Excel, including the use of built-in statistical processing functions. Methods of variational parametric and nonparametric statistics were used with the calculation of the arithmetic mean of the studied indicator (M), standard deviation (SD), relative values (frequency, %), the statistical significance of the measurements obtained when comparing the average values was determined by Student's t test (t) with the calculation of the error probability (R). Comparison of three or more independent groups was carried out by one-way analysis of ANOVA variations. Significance level  $P < 0.05$  was taken as statistically significant changes.

### Research results

General characteristics of patients and features of the distribution of cardiometabolic risk factors are presented in Table 1.

**Table 1.**

**General characteristics of patients and distribution of cardiometabolic risk factors**

Indicator	Group 1 (n=22)	Group 2 (n=23)	Group 3 (n=24)
Age, years	27,7 ±4,5	30,3±5,1	36,8±7,4**∞
Men, abs (%)	10 (58,8%)	9 (50%)	11 (57,8%)
Body mass index, kg/m <sup>2</sup>	21,4±2,2	28,4±2,7**	31,8±4,8 ***∞
SBP, mm Hg Art	114,8±12,4	138,3±11,9**	146,1±10,1***
DBP, mm Hg Art.	76,1±7,5	89,3±5,4**	98,1±6,8***
Burdened heredity for hypertension, abs (%)	10 (58,8)	11 (61,1)	14 (73,6)
AH, abs (%)	6 (35,3)	10 (55,5)	13 (68,4)
Tobacco smoking, abs (%)	5 (29,4)	7 (38,9)	7 (36,8)

Note: \*\*( $p>0.01$ ), \*\*\*( $p>0.005$ ) in relation to the data of the 1st group; ∞ ( $p>0.05$ ) between the 2nd and 3rd study groups.

Patients in the obesity group (Group 3) were significantly older than those in other groups, with no significant gender differences. Patients of the 3 study groups differed in the level of systolic (SBP) and diastolic (DBP) blood pressure. Thus, in the 2nd and 3rd groups of the study, there were high rates of SBP by 20.5% ( $p>0.01$ ) and 28.1% ( $p>0.005$ ), as well as DBP levels by 17.1% ( $p>0.01$ ) and 28.9% ( $p>0.005$ ).

In the overweight and obese groups, AH (55.5 and 68.4% versus 35.3%) and tobacco smoking (38.9 and 36.8% versus 29.4%) were more often detected compared with the 1st study group. .

Despite the high frequency of aggravated heredity for hypertension, no intragroup differences were found. Differences in BMI values were determined by the characteristics of the distribution by groups (the data are presented in Table 1).

**Table 2.**

**Metabolic profile indicators among patients in study groups**

Indicator	Group 1 (n=22)	Group 2 (n=23)	Group 2 (n=24)
Blood glucose, mmol/l	4,96±0,4	5,3±0,6	5,7±0,6**
IR, HOMA-IR	1,7±0,4	2,4±0,6*	4,17±1,16***∞
Total Chs, mmol	4,4±0,6	5,36±0,6**	6,34±1,1***∞
LDL cholesterol, mmol/l	2,2±0,6	2,6±0,7	3,82±1,1***∞

<b>HDL cholesterol, mmol/l</b>	2,2±0,5	1,98±0,5	1,54±0,5**
<b>TG, mmol/l</b>	0,8±0,3	0,99±0,2	1,6±0,8**∞
<b>Leptin, ng/ml</b>	10,9±4,5	25,7±7,2 ***	33,8±9,4*** ∞
<b>Adiponectin, µg/ml</b>	9,1±2,2	7,5±2,4 *	6,49±2,92**

Note: \*(p>0.05); \*\*(p>0.01); \*\*\*(p>0.005) in relation to the data of the 1st group;  
∞ (p>0.05) between the 2nd and 3rd study groups.

The highest concentrations of glucose, insulin and the HOMA-IR insulin resistance index were found in groups with a metabolically unhealthy profile (groups 2 and 3) compared to other groups. Thus, in the 3rd group with obesity, high blood glucose levels were noted by 19.9% and IR by almost 2.5 times (p> 0.005). In the 2nd group with overweight, as well as in the 3rd group with obesity, changes were also observed in the blood lipid profile. The highest concentrations of triglycerides and LDL-C, as well as the lowest HDL-C values were found in the group with metabolically unhealthy obesity (group 3) compared to other groups. It was noted the level of total cholesterol by 21.8% and by 41.4% in the 2nd and 3rd groups in relation to the data of the 1st study group with a normal BMI (p>0.005). In the 3rd group with obesity, there were significantly high values of LDL 73.6% and blood TG (almost 2 times). At the same time, there was also a significant difference in the above-described blood parameters between the 2nd and 3rd groups of the study (p>0.05). The data obtained are consistent with similar data of foreign and domestic authors [9, 13, 14], however, most similar studies include older patients.

Along with the identified disorders of carbohydrate and lipid metabolism, the highest concentration of leptin and a lower concentration of adiponectin were found in groups with metabolically unhealthy phenotypes (groups 2 and 3 by 15.1% (p>0.05) and 40.2% (p> 0.01) compared with the 1st group with normal BMI.

Thus, the results obtained complement the current understanding of metabolic disorders in young people. The results of our study revealed that the most pronounced cardiometabolic disorders, including changes in carbohydrate and lipid metabolism, were found in the group of young patients with abdominal obesity. In young people with abdominal obesity, a higher frequency of the combination of obesity with arterial hypertension and lower concentrations of adiponectin in the blood serum were determined compared to patients with normal body weight. In overweight young people, as well as in obese people, cardiometabolic changes can be detected, which makes it possible to diagnose these disorders in a timely manner and implement effective strategies for the primary prevention of cardiovascular and metabolic diseases.

#### **Conclusions:**

1. It was found that the most pronounced cardiometabolic disorders, including changes in carbohydrate and lipid metabolism, were found in the group of young patients with abdominal obesity.

2. In young people with abdominal obesity, a higher frequency of combination of obesity with arterial hypertension and lower concentrations of adiponectin in blood serum were determined compared to patients with normal body weight.

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## INGUINAL-PELVIC LYMPH DISSECTION IN THE TREATMENT OF METASTATIC LESION OF REGIONAL LYMPH NODES IN VULVAR CANCER

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<https://doi.org/10.5281/zenodo.8172020>

**Abstract.** *Knowledge about the prevalence of the cancer process and its microscopic signs helps to establish the stage of development of the disease, helps to assess the likelihood of tumor recurrence and provides information that will allow the doctor to predict the therapeutic effect. With vulvar cancer, the tumor often spreads along the length and by metastasis to the regional lymph nodes (inguinal, femoral), and then to the pelvic lymph nodes. In malignant tumors, the level of lymph node lesion, which can be determined by lymph node dissection, is of great importance for the choice of treatment method.*

**Keywords:** *lymphodissection, lymphovascular, invasive lesion, metastatic.*

**Introduction.** The incidence of RV is less than half a percent of the global incidence of malignant tumors. In 2018, 44,000 new cases of vulvar cancer were registered worldwide, while the number of deaths was about 15,000 cases. It should be noted that the incidence of RV is higher in high-income countries such as Europe, North America and Oceania [1,2,3].

The most important prognostic signs of vulvar carcinoma are the size of the tumor, the depth of invasion, the status of lymph nodes and the presence of distant metastases. Historically, to assess the status of inguinal nodes, it was required to perform a standard inguinal lymphadenectomy for all types of vulvar cancer. However, this procedure is associated with a high risk of developing lymphedema of the lower extremities (approximately 30-70%) in patients who have undergone complete inguinal-femoral lymph dissection, especially in combination with radiation therapy [4,5,6]. In this connection, it is necessary to conduct research in the field of developing criteria for lymphodissection in RV [7].

**Materials and methods.** The analysis of the results of examination and treatment of 186 patients with vulvar cancer who were treated at the RSNPMTSOIR, the P.A. Herzen Institute of Medical Research – a branch of the Federal State Budgetary Institution "NMIC of Radiology" of the Ministry of Health of Russia (Moscow, Russia), as well as the IstinyeUniversity clinic (Istanbul, Turkey) from 2011 to 2020 was carried out.

With vulvar cancer, the tumor often spreads along the length and by metastasis to the regional lymph nodes (inguinal, femoral), and then to the pelvic lymph nodes. In malignant tumors, the level of lymph node damage is of great importance for the choice of treatment method. Regional distribution occurred in the adjacent areas of the lower third of the vagina, in the rectal ligament. Later, an invasion of the anorectal area developed. The spread to the lymph nodes occurred first in the direction of the inguinal lymph nodes. Metastases to regional, femoral and inguinal lymph nodes were diagnosed in 32.8% of cases. Palpation of the inguinal region can reveal involvement of lymph nodes, but histological data are positive only in 40% of cases with palpable tumors. Lymph nodes affected by metastases out of 61 in 36 (59%) cases were inflamed

and fixed, in this case, although rarely, adenopathy was an alarming symptom. In a large number of cases, the nodes were palpated, often bilaterally, and were displaced.

Patients with a tumor limited only to the vulva or vulva and perineum, measuring 2 cm or less in the largest dimension, with invasion of the underlying tissues up to 1 mm was found in 26.3% of cases.

Isolated lesion of the pelvic lymph nodes is possible when the tumor is localized in the clitoris and areas adjacent to the clitoris. Lymphovascular invasion was detected in 74.7% of patients, vascular invasion in 76.9% of patients. In more than half, the tumor gradation corresponded to G2.

More than 90% of vulvar cancer had a squamous histological form (VSCC – vulvarsquamouscellcarcinoma), in other cases glandular, adenoplastocellular, etc. form.

**Inguinal-femoral lymph dissection.** This type of surgery is one of the most common type of lymph dissection used in oncological practice. In addition to vulvar tumors, this operation is also performed for various tumors of the lower extremities, genital organs, etc. localizations. The technique of performing this type of operation is well developed. In the traditional version, the operation begins with two semi-oval incisions from the anterior upper surface of the ilium, parallel to the inguinal fold with dissection of the skin and subcutaneous fat. The incision was completed near the tendon of the external oblique abdominal muscle. The skin and adipose tissue were separated from the aponeurosis of the external oblique muscle to the center of the Scarp triangle. The umbilical ligament was crossed, while the fascia of the oblique muscle was removed. Gradually dissecting the fiber from the pubic bone tubercle to the apex of the femoral triangle, a block of tissues was isolated from the fiber and lymph nodes of the femoral triangle and femoral canal. The block was removed by crossing the legs.

Indications for lymphodissection were a tumor located in the clitoris, a tumor larger than 2 cm, invasion of surrounding tissues larger than 5 mm, multifocal tumor growth and low-grade intraepithelial carcinoma G-4.

**Results.** The operation was performed in 61 (32.8%) patients (Table 3). Out of 61 patients, 23 patients underwent bilateral lymphodissection, which was 37.7% of the total number of patients with inguinal – femoral lymphodissection. Thus, 84 operations were performed to remove lymph nodes from the regional basin.

Distribution of vulvar cancer patients undergoing radical inguinal – femoral lymph dissection.

<i>N</i>	<i>Clinical characteristics</i>	<i>HPV-27</i>	<i>HPV+34</i>
1.	<b>Stage FIGO</b>		
	II Stage	19 (%)	14
	III Stage	8 (%)	13 (%)
	IV Stage		7 (%)
2.	<b>Localization of the tumor</b>		
	Large labia	9 (%)	11 (%)
	Labia minora	3 (%)	3 (%)
	Back spike	1 (%)	2 (%)
	Periurethral zone	2 (%)	1 (%)
	Clitoris	4 (%)	8(%)

3.	Several anatomical zones	8 (%)	9 (%)
	<b>Histological type</b>		
	Squamous cell carcinoma.	19 (%)	22 (%)
	Squamous Intraepithelial neoplasia, Grade 3		
	Adenocarcinoma	7 (%)	12 (%)
		1 (%)	-

Of these, 35 (18.8%) patients underwent surgery in a standard, traditional method, with a wide excision of the skin of the inguinal femoral zone. In 26 patients (13.9%), the operation was performed using endoscopic technique. The operations were performed according to the standard procedure, using endoscopic surgery equipment manufactured by Karl Storz Endoscopie (Germany). A retractor for subcutaneous endoscopic surgery by Bird and Emory (Snowden Pericer, USA) was used to access the adipose tissue space.

The operation to remove lymph nodes from the inguinal – femoral zone does not present great difficulties in performing. Despite the perfection of all aspects of this operation, in the postoperative period, as with other operations, complications associated with the peculiarity of surgical aggression, the peculiarities of the patient's body were observed.

Postoperative complications after inguinal-femoral lymphodissection (n=84)

	Postoperative complications Number of cases	Postoperative complications Number of cases
1.	Suppuration of the wound	17 (20,2%)
2.	Seam divergence	3 (3,6%)
3.	Lymphostasis	9 (10,7%)

The operation was performed in 61 (32.8%) patients. Of 61 patients, 23 patients underwent bilateral lymphodissection, which was 37.7% of the total number of patients with inguinal – femoral lymphodissection. Thus, 84 operations were performed to remove lymph nodes from the regional basin.

When analyzing the long-term results of lymphodissection, the following features were revealed: in patients with a low-grade histological form of the tumor, with several anatomical lesions, with clitoral lesions, with lymphovascular invasion, 7 (18.4%) of 38 patients who underwent unilateral lymphodissection had metastases of the opposite inguinal zone in the nearest 8 months after surgery.

### **Conclusion**

Thus, the indication for bilateral inguinal – femoral lymph dissection should be, in addition to confirmed metastases in the inguinal region, a low-grade histological form of vulvar cancer, damage to several anatomical zones, lymphovascular invasion of the clitoris.

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# HISTOLOGICAL AND IMMUNOHISTOCHEMICAL CHARACTERISTICS OF PARASAGGITAL MENINGIOMAS OF THE BRAIN

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<https://doi.org/10.5281/zenodo.8172041>

**Abstract.** *Meningiomas, a group of tumors originating from the meninges, have a wide range of morphological characteristics that determine the type and grade of malignancy. The study of anaplastic meningiomas is challenging because they resemble soft tissue malignancies. Immunostaining makes it possible not only to determine the cytogenetic source and the degree of malignancy of the tumor, but also to detect pathological proteins - transcription products of damaged DNA sections and give recommendations on the appointment of targeted therapy.*

**Keywords:** *meningioma, benign, typical, atypical, anaplastic, immunohistochemistry, markers.*

Meningiomas are slow-growing, mostly benign tumors arising from arachnoendothelial detachments of the dura mater [2]. In the adult population, meningiomas are observed in 18-34% of cases of all intracranial neoplasms, confidently occupying the 2nd place among all brain tumors and second only to gliomas. The incidence is 4-6 per 100 thousand population. Most often, meningiomas occur in the 4th-6th decade of life. The frequency of their occurrence is much higher in women, especially among middle-aged people [3, 12].

To the occurrence of meningiomas. They often develop in patients with neurofibromatosis type 2. In addition, there is evidence of families with an increased tendency to form meningiomas that do not suffer from neurofibromatosis. The occurrence of meningiomas is associated with exposure to ionizing radiation, hormonal imbalance, trauma, and magnetic field [3].

The cytogenetic source of meningiomas is transformed arachnoid meningotheial cells [1]. Prior to microscopic examination, it is very important for a pathologist to clarify the localization of the tumor, the location of its matrix bed, the involvement of surrounding structures, and the presence of a capsule. Most meningiomas are clearly demarcated from the surrounding nervous tissue, more often they grow as a single encapsulated node (they push back and compress the surrounding tissues). However, meningiomas are also capable of invasive growth, sprouting the substance of the brain, dura mater, adjacent bone with the formation of hyperostoses and extracranial nodes. In addition, due to the frequent involvement of the cavernous sinus and the main cerebral vessels in the tumor process, the frequency of continued growth of meningiomas is up to 45% [3, 6, 14].

CLINICAL CHARACTERISTICS AND HISTOLOGICAL CLASSIFICATION OF  
MENINGIOMAS BY WHO (2007)

Despite the fact that most meningiomas are benign, this group of tumors is characterized by certain clinical signs and histological variants that are associated with a high risk of recurrence. Rarely, malignant types of meningiomas occur.



The proposed WHO histological classification suggests a clinical prognosis for patients with meningiomas based on statistically significant clinicopathological correlations [10].

According to this classification, it is customary to distinguish between three grades of meningiomas: benign or typical (WHO grade 1), atypical (WHO grade 2) and anaplastic meningeal tumors (WHO grade 3)

#### TYPICAL OR BENIGN MENINGIOMAS (WHO GRADE 1)

Approximately 80% of all meningiomas are slow-growing, benign, WHO grade 1 tumors. Most of the histological variants of meningiomas correspond to WHO grade 1, with the exception of chordoid, clear cell, rhabdoid, and papillary meningiomas, which are characterized by a rapidly progressive and invasive growth pattern [23]. The most common in clinical practice are meningotheliomatous, fibrous and transitional meningiomas. The meningotheliomatous variant of meningiomas consists of homogeneous tumor cells in the form of lobules separated by thin collagen fibers. Inside the lobules, the cell boundaries are indistinct, resembling a syncytial structure. The shape of tumor cells varies from polygonal to epithelioid. The contours of the nuclear membrane are even, the chromatin structure is fine-grained, uniform, the nucleoli are not visualized [7]. Fibrous meningioma is a group of spindle-shaped cells resembling fibroblasts that form intertwining bundles embedded in a matrix rich in collagen and reticulin fibers. The transitional or mixed variant of meningiomas combines the features of meningotheliomatous and fibrotic variants. In this case, meningotheliomatous bodies are often found with fibroblast-like cells located along the periphery. The meningotheliomatous variant of the tumor is characterized by concentric meningotheliomatous structures, sometimes with a vessel fragment in the central part. Much less often, such structures are determined in other types of meningiomas. With hyalinosis and calcification of concentric structures, the so-called psammoma bodies (rounded layered calcified bodies) are formed (Fig. 1c). It should be noted that smears of meningioma with a predominance of psammoma structures should be interpreted as a psammoma variant of the tumor [18, 22]. When stained with hematoxylin-eosin, small or large psammoma bodies have a pinkish-violet tint. Meningothelioma bodies are often found in a psammoma-free smear, however, psammoma bodies are usually associated with a concentric cellular structure. It is important to distinguish psammoma from the smallest bone fragments, which can sometimes get into the histological material during its sampling.

Typical meningiomas are capable of invasive growth, sprouting the dura mater, cerebral sinuses, the main vessels of the brain, and also spread beyond the cranial cavity. All this leads to great difficulties in performing microneurosurgical resection of the tumor and reduces the degree of its radicalization. However, the invasive growth potential of WHO grade 1 meningiomas should not be considered equivalent to atypical or malignant types.

#### ATYPIC AND OTHER HISTOLOGICAL OPTIONS OF WHO GRADE 2 MENINGIOMAS

Atypical meningiomas account for 15-20% of all types of meningiomas. Atypical meningiomas are prone to aggressive growth and frequent recurrence. So, after a radical resection of a benign meningioma, the percentage of recurrence in the next 5 years is about 5%. As for atypical meningiomas, the percentage of their recurrence in the next 5 years is more than 40% and increases over time [6]. Therefore, when verifying a patient with an atypical form of meningioma, the timing of his next follow-up after surgery should be no later than 3 weeks [17].

The most reliable prognostic risk factor for meningioma recurrence in histopathological examination is the number of mitoses. Four or more mitoses per 10 visual fields is a reliable sign of a high risk of meningeal tumor recurrence [18]. However, the absence of a high degree of mitotic activity of tumor cells does not exclude a high risk of meningiomas recurrence. According to the 2000 WHO criteria, pathological confirmation of atypical meningioma (Fig. 2a) requires at least three of the five proposed criteria: a large number of cells, a high nuclear-cytoplasmic ratio (small cells), visualization of the nucleoli, leaf-like growth, foci of spontaneous necrosis (not induced by embolization or radiotherapy).

As already mentioned, atypical meningiomas, along with chordoid and clear cell variants, are more aggressive tumors and have a 2nd degree of malignancy according to the WHO classification. Clear cell meningioma is characterized by leaf-like aggregations of polygonal cells rich in glycogen, nuclear atypia, enlarged perivascular spaces, and the absence of meningothelioma bodies. The cells have a light vacuolated cytoplasm (often vacuoles occupy most of the cytoplasm), the formation of syncytium-like structures of 6-8 nuclei takes place. Chordoid meningioma got its name for the similarity of some of its parts with chordoma and is represented by an abundance of oxyphilic extracellular matrix around tumor cells, this matrix braids individual cells in the form of thin strands. The cytoplasm is wide, polygonal, with irregularly shaped processes in the form of "thorns", the edges of which are sometimes poorly distinguishable (tumor cells resemble cells of the thorn-like layer of squamous epithelium). Most of the cell nuclei have a uniform chromatin structure, contain nucleoli with fuzzy contours. The presence of such properties as pronounced nuclear polymorphism, enlarged hyperchromic nuclei with uneven contours and larger, clear nucleoli allows this variant to be classified as an aggressive meningiomas. A feature of the localization of these variants of meningiomas was noted: clear cell meningioma is often located in the spinal cord and in the region of the posterior cranial fossa, for chordoid meningiomas are characterized by supratentorial location [24].

#### **ANAPLASTIC (MALIGNANT) MENINGIOMAS AND OTHER MENINGIOMAS WHO STAGE 3 MALIGNANCE**

Anaplastic meningiomas account for 1 to 3% of all types of meningiomas. This type of tumor has a number of clinical and histological properties similar to other malignant tumors (cancers and sarcomas): aggressive infiltrating growth and the ability to metastasize. The recurrence rate of anaplastic meningiomas after microneurosurgical resection ranges from 60% to 80%, and the median survival is less than two years [9, 10].

A histological feature of anaplastic meningiomas that determines a high degree of malignancy is a high index of mitotic activity of tumor cells - twenty or more mitoses per 10 fields of view. Often, anaplastic meningiomas can resemble sarcoma, cancer, or melanoma in their picture, which makes it difficult to determine the cytogenetic source of the tumor and its affiliation. However, for anaplastic meningioma, the presence of peripheral tissue shreds and fragments is uncharacteristic, in contrast to soft tissue malignant tumors [11]. In addition, the presence or absence of melanin pigment will also help in determining the correct diagnosis. In histological sections, signs of sharp polymorphism, an abundance of mitoses, and necrosis are noted. As a rule, there are continuous cell fields of small monomorphic tumor cells with areas of cavities of the epithelial-embryonic type [16]. Along with anaplastic meningioma, high-grade meningiomas also include papillary and rhabdoid meningiomas. Papillary meningioma is characterized by invasive growth, persistent recurrence, and frequent metastasis. This variant is very difficult to distinguish

from the papillary variant of metastatic cancer. The age of the patient (usually younger than 15 years) and the localization of the tumor (usually in the posterior cranial fossa) testify in favor of papillary meningioma. Histologically, this variant of meningiomas is represented by monomorphic cells with relatively large hyperchromic nuclei. Tumor cells form papillary structures without pronounced papillary fibrovascular stroma. Necrosis is not typical. rhabdoid meningioma consists of round-shaped tumor cells with a large nucleus. When stained with hematoxylin-eosin in a histological preparation, the cytoplasm is eosinophilic, the cells resemble skeletal muscle myoblasts. Under light microscopy, there is no transverse striation in the cytoplasm; under electron microscopy, organelles and Z-bands characteristic of skeletal muscle myocytes are not detected, but complexes of vimentin-positive intermediate filaments are found. Since the cells resemble rhabdomyocytes, but are not, the tumor was called " rhabdoid " [14]. It is a very aggressive malignant tumor with a high recurrence rate and frequent metastasis.

#### IMMUNOHISTOCHEMISTRY OF MENINGIOMAS

Immunohistochemical examination plays an important role in the diagnosis of meningiomas, especially in cases of anaplastic forms. However, in some cases of anaplastic forms of meningiomas, even when using immunohistochemical markers, it is extremely difficult to determine the type of tumor and its cytogenetic source [4, 21].

The most common immunohistochemical marker of meningiomas is epithelial membrane antigen (EMA), which is detected in most types of meningiomas [12, 15]. The use of such a marker as vimentin also helps in making a diagnosis, since many variants of meningiomas contain this neurofilament [5]. Unfortunately, EMA and vimentin are not pathognomonic markers for this group of tumors, and additional immunohistochemical markers are needed for full verification.

Another important sign of meningiomas, determined by immunohistochemistry, is the proliferative index, which is traditionally determined in clinical pathology using antibodies to the nuclear antigen MIB-1 (Ki-67). Expression of Ki-67 makes it possible to isolate tumor cells that are in the active phase of the cell cycle throughout its entire length (G1-, S-, G2- and M-phases). Ki-67 is absent only in the G0 period. Actively proliferating tumor cells represent the "growth fraction" of the neoplasm. Proliferative activity is a leading factor both in the mechanism of malignant transformation of cells and in the biological behavior of tumors that have already arisen. The index of proliferative activity in different tumors has different values, while being an independent prognostic sign that determines the clinical course and prognosis of the disease. For meningiomas, with a Ki-67 index of more than 5%, the tumor is considered aggressive and has a high risk of recurrence [8]. Recently, the expression of progesterone receptors in meningioma cells has been increasingly determined. At the same time, the degree of expression of receptors for this steroid hormone is inversely related to the degree of malignancy of meningioma, but so far this marker has not entered into wide clinical practice [19].

A completely new immunohistochemical marker that allows determining the degree of malignancy of meningiomas is an antibody to mitosis-specific phosphohistone-H3. Staining preparations with these antibodies allow the pathologist to clearly visualize mitotic figures and distinguish them from apoptotic nuclei, which are almost identical in conventional examination [20].

#### CONCLUSION

Thus, meningiomas have a wide range of morphological characteristics that ultimately determine the type and degree of malignancy of this group of brain tumors. Of particular difficulty

in the study are anaplastic meningiomas. This type of tumors has a number of similarities with soft tissue malignant neoplasms (cancer, sarcoma, melanoma) and it is not possible to distinguish them from each other without immunohistochemistry. At present, the immunohistochemical method continues to develop actively, having taken a strong place among the diagnostic methods in oncology. Thanks to immunostaining a pathologist can not only determine the cytogenetic source and the degree of malignancy of the tumor, but also detect pathological proteins - transcription products of damaged DNA sections and give recommendations on the appointment of targeted therapy.

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## OPTIMIZATION OF MYOCARDIAL PROTECTION METHODS DURING RADICAL CORRECTION IN CHILDREN WITH SEPTAL HEART DEFECTS

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<https://doi.org/10.5281/zenodo.8172067>

**Abstract.** *The number of patients with congenital heart disease (CHD) is constantly growing all over the world and remains the most common pathology. Statistics of recent years indicate an increase in the number of children with septal heart defects and an increase in mortality. This article discusses the optimization of myocardial protection methods during radical correction in children with septal heart defects.*

**Keywords:** *septal heart defects, congenital heart disease, pathology, mortality.*

**Introduction.** The issues of effective surgical care for patients with diseases of the heart and blood vessels are relevant for the practical health care of the Republic of Uzbekistan.

The number of patients with congenital heart disease (CHD) is constantly growing all over the world and remains the most common pathology. Statistics of recent years indicate an increase in the number of children with septal heart defects and an increase in mortality.

Surgical methods for the treatment of congenital heart disease remain leading today, and the problem of myocardial protection poses new challenges for researchers.

Improvement of surgical technique, methods of cardiopulmonary bypass and assisted circulation, and myocardial protection have made it possible to significantly expand the indications for surgery and significantly increase the number of operated patients with CHD with hypervolemia of the pulmonary circulation and high pulmonary hypertension. Similar trends in the development of pediatric cardiac surgery determine the need not only to improve the quality of radical correction, but also to develop optimal options for the tactics of surgical interventions, as well as adequate ways to protect the myocardium.

To date, the concept of cardioprotection in operations with cardiopulmonary bypass considers several areas, the leading one of which is local myocardial protection. Cardioplegia is the only generally recognized method of local myocardial protection [1,2,3,4]. Improving the effectiveness of myocardial protection contributes to the optimization of cardioplegia parameters.

In recent years, a lot of work has been presented in the relevant literature regarding the comparison of the effectiveness of myocardial protection using pharmacological cold cardioplegia (PCC) intracellular "Custodiol" and extracellular crystalloid cardioplegia. In recent years, FHKP intracellular "Custodiol" has been increasingly used and now there is already evidence of its successful use in almost all types of heart surgery. As can be seen from the above, the question of



choosing the method of myocardial protection in the world literature remains debatable, which determines the scientific and practical relevance of this study, its purpose and objectives [5].

In connection with the above, we would like to raise the issue of the effectiveness of the use of intracellular "Custodiol" and extracellular crystalloid cardioplegia in patients with congenital heart disease, FHKP and the possibility of using this technique in patients with septal heart defects.

**Purpose of the study:**

Optimization of myocardial protection methods during radical correction in children with septal heart defects.

**Materials and methods of research:** 69 patients with septal heart defects were examined in the Department of Cardiovascular Surgery in patients of the ODMC of the Samarkand region for the period from 2020 to 2021. There were 33 females (47.8%), males 36 (52.2%). At the time of admission to the hospital, the average age of patients was  $2.1 \pm 1.3$  years, body weight  $-10.8 \pm 2.1$  kg, height  $-81.4 \pm 7.9$  cm. The average arterial oxygen saturation was  $91 \pm 4\%$ . The hemoglobin level at admission averaged  $133.4 \pm 24.6$  g/l.

The analysis of the metabolic and functional state of the heart and coronary vessels, as well as the clinical characteristics of patients was carried out.

According to EchoCG data, an ejection fraction of more than 65% was recorded in 37 (53.6%) patients, less than 65% in 32 (46.4%) patients.

Depending on cardioplegic protection, patients were divided into two groups:

- Group I (n = 32) - where antegrade intracellular crystalloid cardioplegia "Custodiol" was used with a temperature of  $5-8^{\circ}\text{C}$ . The heart is perfused for 6-8 minutes with the height of the perfusion capacity above the level of the heart initially about  $140\text{ cm} = 100\text{ mm Hg.Art.}$  and at the rate of 40 ml/kg;

- II group (n = 37) - where antegrade intermittent crystalloid extracellular cardioplegia was used with a temperature of  $5-8^{\circ}\text{C}$ ;

The duration of myocardial ischemia in group I was  $25.4 \pm 6.12$  minutes, in group II  $28.1 \pm 7.17$  minutes. The ratio to EC time in group I was  $1.88 \pm 0.17$ , in group II  $1.9 \pm 0.13$  ( $p > 0.05$ ).

**Results of the study:** The nature of cardiac arrest during the period of cardioplegia induction was studied. The onset of asystole through the development of intracardiac blockade was considered optimal from the point of view of energy saving. In the majority of operated patients (91.3%), blockade was the predominant mechanism of asystole (n = 69). In group 1, in 2 (6.2%) cases, cardiac arrest was noted due to ventricular fibrillation, in the second group, fibrillation was observed in 4 (10.8%) patients.

An analysis of the occurrence of spontaneous electrical activity during the main stage of the operation revealed the absence of significant differences in both groups.

The frequency of administration of a crystalloid cardioplegia solution during induced total myocardial ischemia in group I was 1 time. allows to provide effective protection of the heart in conditions of general moderate hypothermia during cardiac ischemia lasting up to 180 minutes after a single injection. FHKP "Custodiol" contains a histidine buffer, which allows you not to resort to peroxygenation. The hyposodium buffer determines the intracellular mechanism of tissue protection. The use of FHKP "Custodiol" makes it possible to increase the resistance of tissues of the myocardium, kidneys, liver of other internal organs to hypoxia due to the presence in its composition of balanced components that determine the metabolic protection of cells and their

ionic balance; in group II, the frequency of administration of cardioplegia was  $3 \pm 1$  times. Therefore, FHKP "Custodiol" cardioplegic protection was not accompanied by an increase in the need for a cardioplegia component, which, in combination with EC time indicators, indicates a predominant role of Custodiol in the development of reversible cardiac arrest than crystalloid cardioplegia.

Favorable recovery of cardiac activity after removal of the clamp from the aorta was considered the appearance of sinus rhythm through transient intracardiac blockade in the absence of ventricular fibrillation. In group I, electrical defibrillation was required in 2 (6.3%) patients, in the second group 3 (8.2%) patients ( $p < 0.01$ ).

When analyzing electrocardiographic data, after removing the clamp from the aorta in both groups, by the end of the extracorporeal bypass, there were no signs of myocardial ischemia in the form of ST segment shift on the ECG.

Cardiac weakness in the immediate postoperative period was observed in 1 (3.1%) patient of group I and in 5 (13.5%) patients of group II ( $p > 0.05$ ), who on the first day after surgery were prescribed dopamine at a dose of 3 up to 6 mcg / kg / min.

To assess the adequacy of myocardial protection, we observed hemodynamic parameters after cardioplegia and restoration of cardiac activity, which is one of the important dynamic criteria for adequate cardioprotection according to world literature. The hemodynamic parameters obtained by us (systolic and diastolic pressure) indicate that in all groups in the early postoperative period, the heart was able to provide adequate hemodynamics. Also, an important criterion for the normalization of cardiac activity and stabilization of hemodynamics was the early appearance of sinus rhythm.

Thus, based on the results obtained using hemodynamic control, it seems possible to state that the majority of patients with septal heart disease were performed under conditions of adequate cardioplegia.

The duration of postoperative mechanical ventilation - BB L was estimated. In group I, this period was  $4.7 \pm 1.5$  hours, in group II -  $4.9 \pm 1.7$  hours ( $p > 0.05$ ). On the first day, the levels of serum enzymes - AST, CPK, CPK-M B were studied. Signs of myocardial damage were considered to be an increase in the MB fraction of more than 10% of CPK. Blood samples were examined 6, 12, 24 hours after the patient's admission to the ICU.

In the postoperative period, the level of CPK increased in both groups of patients. Despite the fact that this enzyme is not cardiospecific, in II d py pp e the smallest increase was noted with a significant difference after 12 and 24 hours ( $p < 0.05$ ).

When assessing the level of CPK-M B in both groups, an increase in this isoenzyme was noted during the first 12 hours with a tendency to a subsequent decrease, and in group II its level was higher than in group I ( $p > 0.05$ ). Analysis of the dynamics of the percentage of the isoenzyme to total CPK did not reveal significant intergroup differences ( $p > 0.05$ ), however, in the group I there was an increase in this indicator from 12 to 24 hours of the postoperative period, while in group II, at the same time, a decrease in the proportion of CPK-M B was registered. The percentage of CPK-M B after 24 hours in group II was characterized by a significantly higher level than in group I.

The dynamics of the content of this enzyme in group I is characterized by a gradual increase during the first 12 hours of the postoperative period, stabilization of its concentration in the second half of the first day. Group II did not differ from group I, where there was also a gradual increase

during the first 12 hours of the postoperative period and stabilization of its concentration in the second half of the first day.

On the fifth day of the postoperative period, according to EchoCG data, in group I (n = 32) the volume of pericardial exudate averaged 50.0±12.0 ml, in group II (n =37) this figure averaged 70.0±17.0 ml (p <0.05 vs group I). These results confirm the negative effect of cardioplegic protection and EC duration on the state of local immunity manifested by a significantly large amount of pericardial exudate in the postoperative period. Two patients of group II (4.16%), due to excessive production of exudate (more than 100 ml), with the ineffectiveness of conservative therapy, needed to evacuate excess fluid. In group I, there was no need for puncture (p <0.05).

In the study of the incidence of atrial fibrillation in the early postoperative period in operated patients, in group I, the occurrence of atrial fibrillation paroxysm with the need for medical correction in the postoperative period was noted in 1 (3.1%) patient, in group II, these rhythm disturbances were observed in 5 (13.5%) of patients (p >0.05 relative to group I). The obtained results indicate a lesser influence of the used thermal method of cardioplegic protection on the frequency of occurrence of cardiac arrhythmias in the postoperative period.

**Conclusions:** Thus, in a comparative analysis of the effectiveness of two methods of myocardial protection based on FHKP "Custodiol" and crystalloid cardioplegia, it was revealed that in clinical conditions myocardial protection during ASD and VSD operations provides reliable cardioprotection. FHKP "Custodiol" is not only not inferior to the crystalloid cardioplegia technique, but also surpasses it in providing intraoperative electromechanical stability of the myocardium, preventing the occurrence of reperfusion arrhythmias, is characterized by less damage to enzymatic cellular structures and less pronounced manifestations of postpericardiotomy syndrome in the postoperative period.

The FHKP method "Custodiol" is the method of choice for protecting the myocardium, which allows you to evenly reduce the rate of metabolic processes during ischemia and not cause irreversible changes in cells and anoxia period, which allows you to avoid dangers in patients with left ventricular hypertrophy, during complex and traumatic operations, with clamping of the aorta for long periods.

According to the percentage of self-recovery of cardiac activity and the percentage of exit from EC with cardiogenic support, as well as taking into account laboratory data (there was no increase in the level of specific cardiac enzymes in the blood) and electrofunctional research methods (data before and after surgical ECG and EchoCG), we can say that this method is effective for protecting the myocardium during operations with EC. But at the same time, it should be noted that the question of developing the most optimal method of intraoperative myocardial protection is still open, and further study of this technique is required.

The use of FHKP "Custodiol" for intraoperative protection of the myocardium does not have a cardiodepressive effect during septal operations and provides effective protection of the myocardium in children. The use of FHKP "Custodiol" can significantly reduce the number of postoperative rhythm and conduction disturbances in comparison with the available literature data.

This method of protecting the myocardium FHKP "Custodiol" is technically not complicated and can be used when performing major reconstructive operations on the heart.

**Conflict of interests:** Authors declare none conflict of interests.

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## DIAGNOSTIC VALUE OF DERMATOSCOPY IN ATOPIC DERMATITIS IN CHILDREN

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<https://doi.org/10.5281/zenodo.8185620>

**Abstract.** *The study of the morphological characteristics of skin changes according to the results of dermatoscopy was provided in children aged 3 months to 17 years with several clinical forms of AD. It is advisable to use dermatoscopy to optimize the early diagnosis of ad in children, objectively assess the pathological process on the skin, predict the course of the disease, control the therapeutic effectiveness of the treatment process and the measures used. Comparing the results of dermatoscopy and the clinical picture increases the reliability of the information obtained during the examination.*

**Keywords:** *dermatoscopy, atopic dermatitis, skin, children, diagnostics.*

Atopic dermatitis is one of the most frequent and first manifestations of allergies, often transforms into other forms of allergies, significantly reduces the quality of life of children regardless of age, requires long-term, phased treatment and rehabilitation. The incidence of atopic dermatitis in the world is up to 5-10% among adults and up to 20-30% among children and adolescents. The skin with atopic dermatitis is not only the "mirror of atopy", but also the "entry point" (entrance gate) for the following systemic [1,2].

Despite the successes achieved in the diagnosis and treatment of atopic dermatitis, many aspects of this problem remain controversial, since it is not possible to avoid subjectivity in assessing skin manifestations and reactions to therapy. Dermatoscopy of the skin is considered one of the promising methods of diagnosing atopic dermatitis [7].

Dermatoscopy is a relatively new promising non-invasive method of examining the skin with an increase of  $\times 10$  or more. The term "dermatoscopy" was introduced in 1920 by dermatologist I. Safir, who used immersion oil when studying pigmented skin neoplasms under a binocular microscope [3]. Just like Una and Kromayer previously, Safir focused his research mainly on inflammatory skin diseases. Unlike those times when inconvenient and complex stereomicroscopes were used, simpler and lighter manual dermatoscopes are used today. The method of dermatoscopy has developed and proved its advantages for the diagnosis of pigmented skin formations in vivo.

Dermatoscopy is a non-invasive instrumental method of visual assessment of the skin surface using optical devices (dermatoscopes), allows you to visualize the structures of the epidermis and papillary layer of the skin, which are invisible to the naked eye. Optical methods of skin research have high information content and resolution.

By using dermatoscopy, it can be viewed with such an increase that the color and structure of the epidermis, the dermoepidermal junction and the papillary layer of the dermis become visible. This color and structure cannot be seen with the naked eye. With the skills and experience, dermatoscopy significantly increases the accuracy of the clinical diagnosis [2].

Dermatoscopy – epiluminescent microscopy – allows visualization of intradermal morphological structures located in the epidermis, mainly in the papillary dermis [3]. In addition to the well-known use of dermatoscopy in the diagnosis of skin neoplasms, the method is gaining increasing appreciation in dermatology among clinically practicing doctors [4–6]. In recent years, dermatoscopy has been increasingly used in the diagnosis of various skin diseases. In particular, the criteria for the diagnosis of various benign skin neoplasms (dermatofibromas, seborrheic keratosis, keratoacanthomas, etc.), basal cell skin cancer, vascular skin formations, scabies, lichen planus, psoriasis and many other skin, nail and hair diseases are described.

It should be noted that the results of dermatoscopy should always be interpreted in a general clinical context, conclusions should be based on the general clinical picture, medical history data and general examination. Some dermatoscopic criteria are strictly specific to a particular disease, while others may occur in several cases at once and are considered "non-specific". However, "non-specific" criteria, when combined with other clinical criteria, lead to an accurate diagnosis or narrow down the list of possible diagnoses. Currently, dermatological diseases can be diagnosed using dermatoscopy, which is especially useful for atypical or unusual course of dermatoses.

The search for criteria facilitating the clinical diagnosis, contributing to the objectified dynamic observation of pathological skin changes, led to the improvement of dermatoscopy techniques and its active use in dermatology. However, there is a scant amount of data in the literature on the dermatoscopic picture of some skin diseases, including atopic dermatitis.

**The purpose of the study.** To study the prospects and possibilities of using skin dermatoscopy as a method of objective assessment of the skin condition in atopic dermatitis (AD) in children based on the analysis of experience from clinical practice and the results of skin examinations.

**Research materials and methods.** 126 children aged 3 months to 17 years with various clinical forms of atopic dermatitis were under observation in the department of Pediatric Dermatology of the Tashkent Pediatric Medical Institute clinic. Distribution of patients by gender showed that 64 (50.8%) of the subjects were boys and 62 (49.2%) were girls. All patients, in addition to standard clinical and laboratory tests, underwent dermatoscopy. The study was performed on the affected areas of the skin, a comparison was made with the intact areas, the condition of the skin vessels was determined. To study the skin pattern of patients, a dermatoscope Hair Analyser LED ("Scharf® Instruments", Turkey) was used. The dermatoscope increased the area of the affected skin tenfold and made structural changes visible. Dermatoscopy data (the nature of the boundaries, the structure of the skin) were recorded in an electronic database in Microsoft Excel 2019 format.

According to the world literature, a sequential algorithm is used to interpret the dermatoscopic picture of inflammatory skin diseases, including:

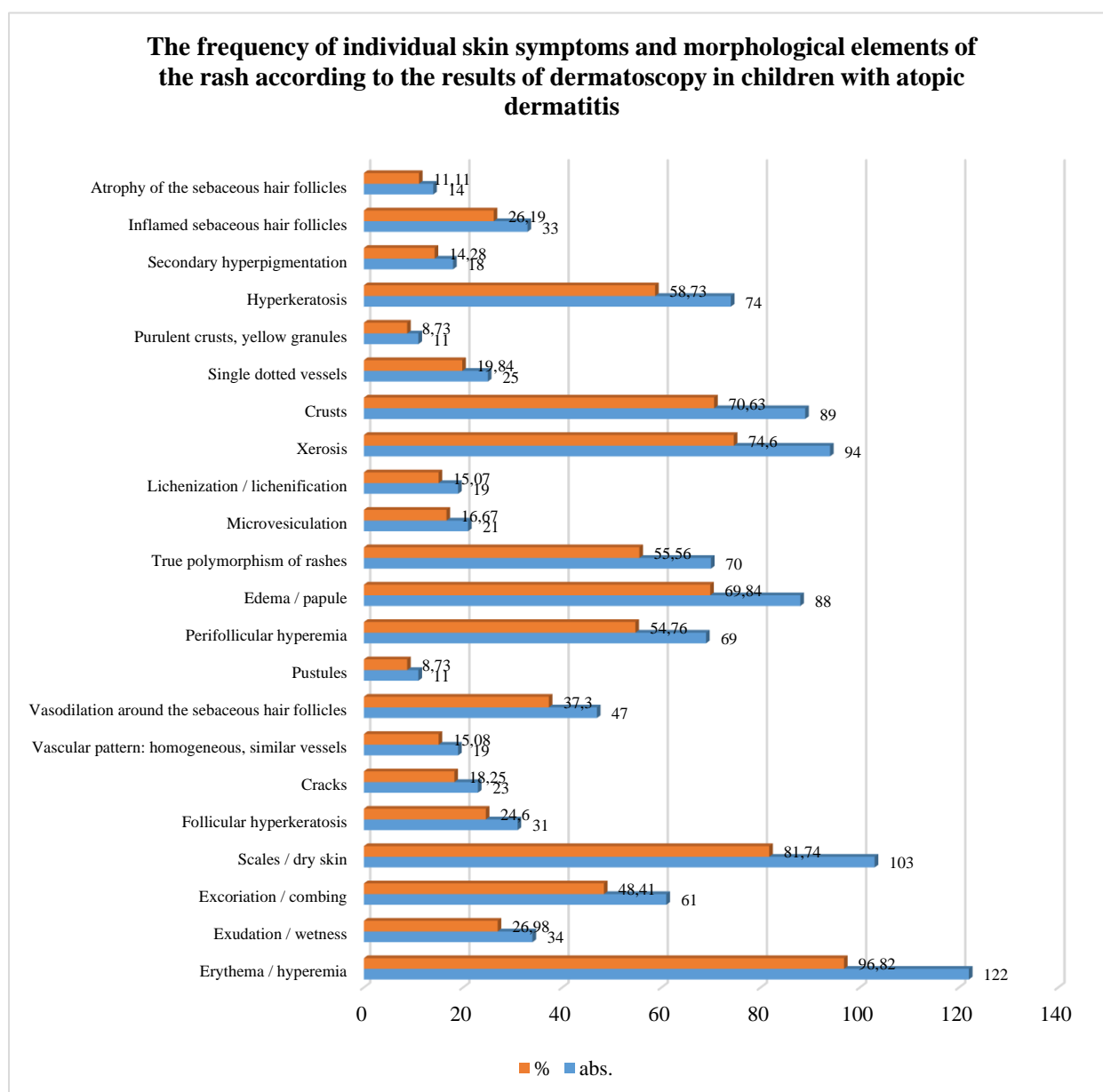
- morphological assessment of vascular structures;
- assessment of the distribution of vascular structures within the rash;
- assessment of the color of the defined structures;
- assessment of morphological elements of the rash.



At the same time, the main emphasis in dermatoscopic diagnostics is on the vascular component of rashes.

**Research results.** According to the data of the performed dermatoscopy, the skin symptoms on the affected areas of the skin of sick children corresponded to the typical morphological elements of the rash for the disease (Figure 1).

The most common skin symptoms and morphological elements of the rash were: erythema/hyperemia, exoriation/combing, inflamed sebaceous hair follicles with perifollicular hyperemia, enhanced reticular skin pattern with lichenization/lichenification, scales and dry skin, crusts, exudation/wetness, and also in most children there were real and fake polymorphism of rashes, edema, papules, follicular hyperkeratosis. Xerosis, cracks, atrophy of sebaceous hair follicles, purulent crusts, yellow granules, hyperkeratosis, etc. were observed much less frequently.



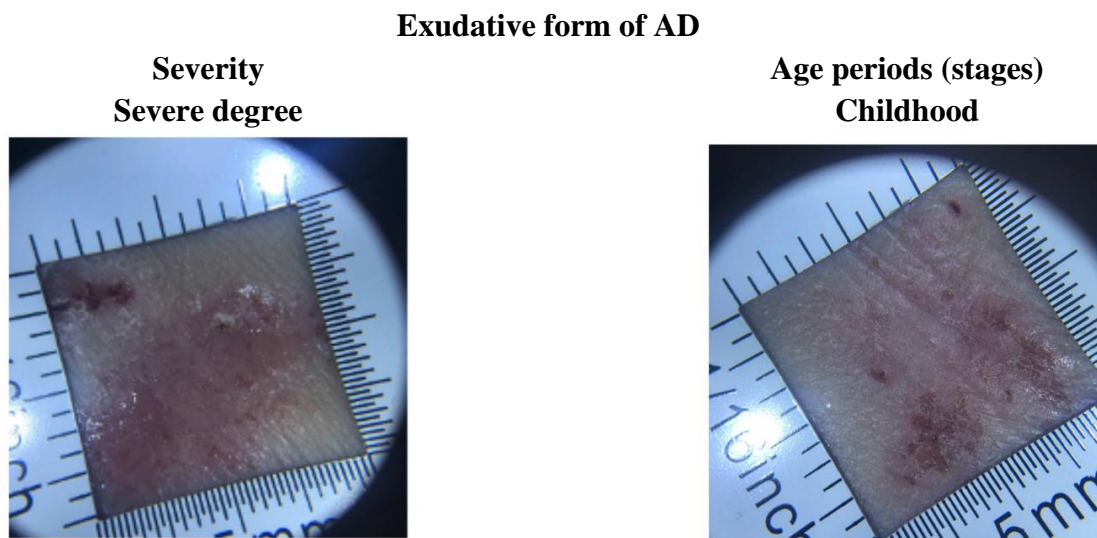
**Figure 1.**

Assesment of the dermatoscopic picture in the examined patients determined the boundaries, the nature of the color of the focus and the characteristics of the vascular network in the form of a combination of red granules, dots and lines at the same time as differential signs. In

AD the focus of the boundaries were blurred, rashes had a pink or bright pink uniform color, the vascular network was represented in the form of glomerular vessels (red granules, dots).

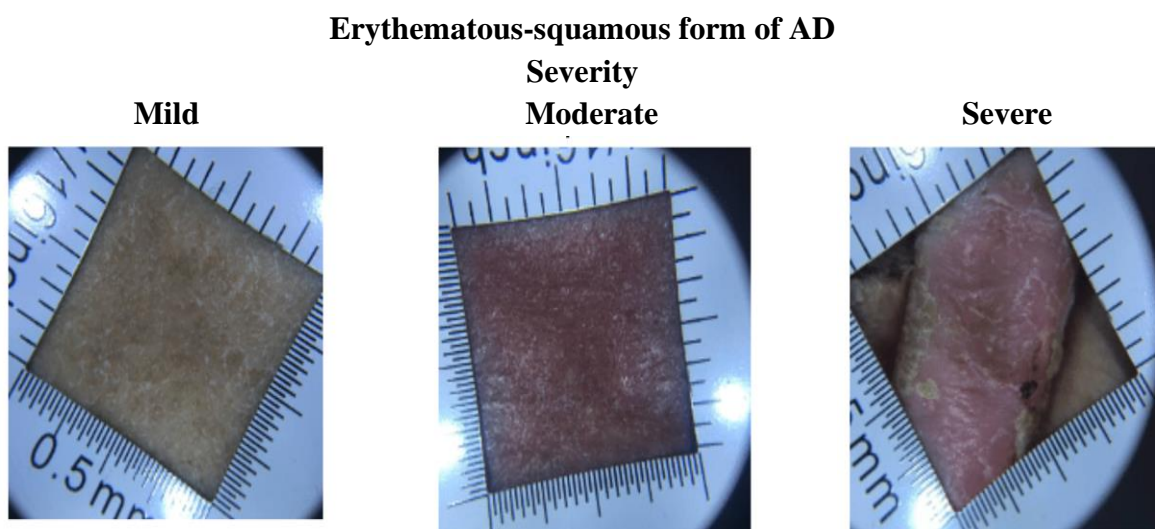
Thus, it was found that the dermatoscopic picture of blood pressure was characterized by a combination of focally distributed within the rashes of vessels in the form of dots and scales-crusts of yellow color. A distinctive feature of rashes in AD is a clearly defined morphology of rashes depending on the forms of the disease during dermatoscopy.

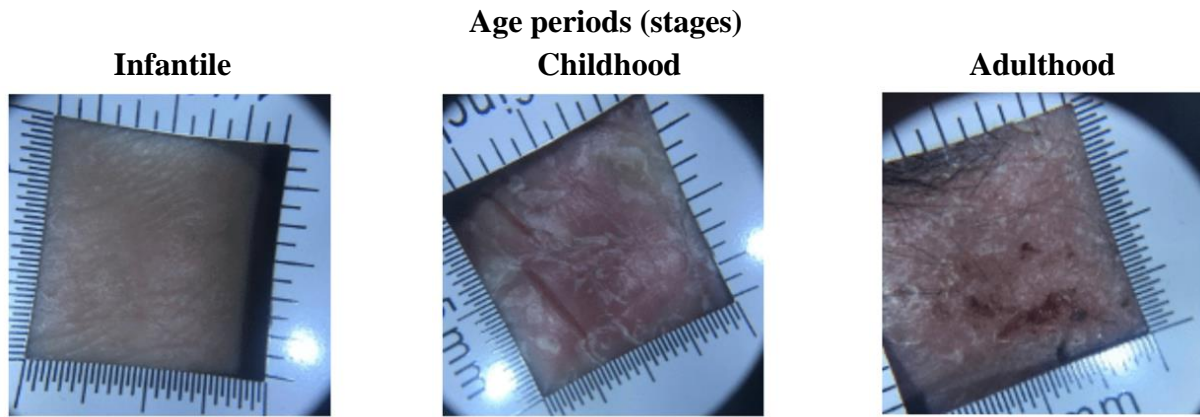
**Exudative form of AD** is characterized by the presence of an infiltrated focus with a wet surface and a blurred border, bright pink uniform color, yellowish crusts located on a pronounced erythematous background, the vascular network in which takes the form of glomerular vessels (red granules), it is also possible to detect erosive foci with wetness at the onset of the disease (Figure 2).



**Figure 2.**

**Erythematous-squamous form of AD** is manifested by dry pink foci with indistinct borders, an erythematous background on which whitish scales are located, a vascular network of a mesh character evenly distributed within the rash, where cracks can also be detected (Figure 3).



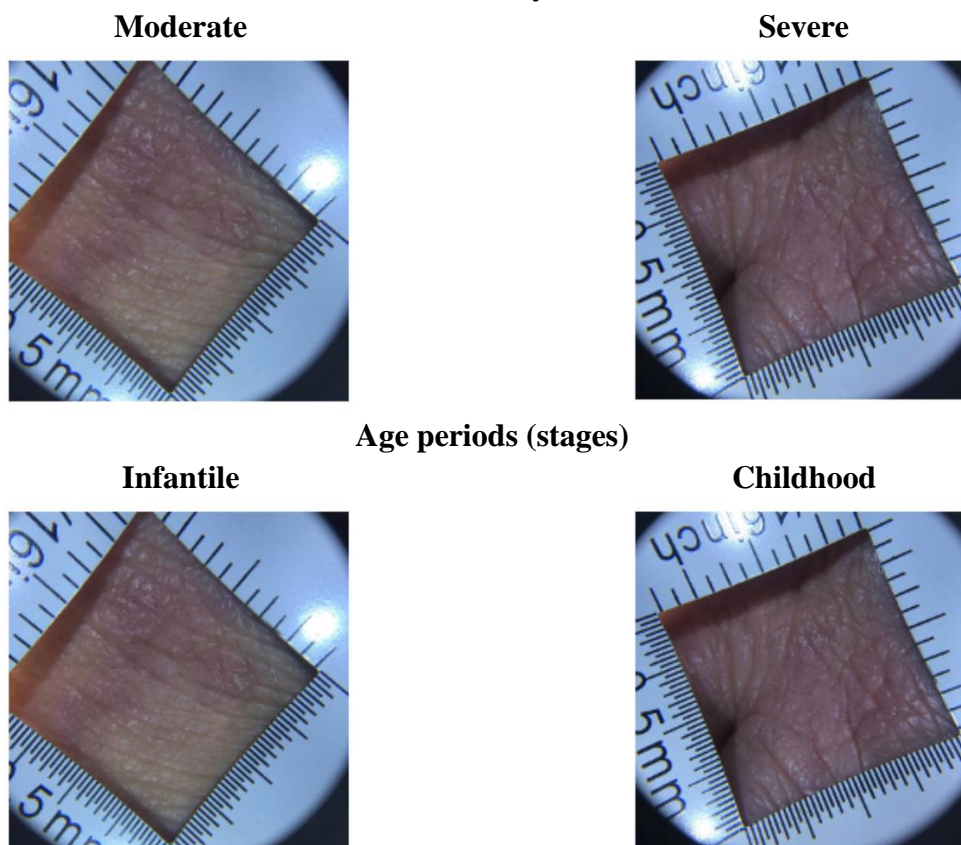


**Figure 3.**

In **erythematous-squamous form of AD with lichenification**, the focus has a uniform pale pink color against the background of moderate erythema, the boundaries of which are blurred, the picture consists of a combination of evenly distributed mesh vascular structures, scale-crusts on the surface of rashes and it is possible to detect inclusions of grayish-dirty color (lichenification) with a less pronounced vascular component, in longer-existing foci. It is also possible to detect spot hemorrhages as a result of scratching and itching (Figure 4).

**Erythematous-squamous form of AD with lichenification**

**Severity**

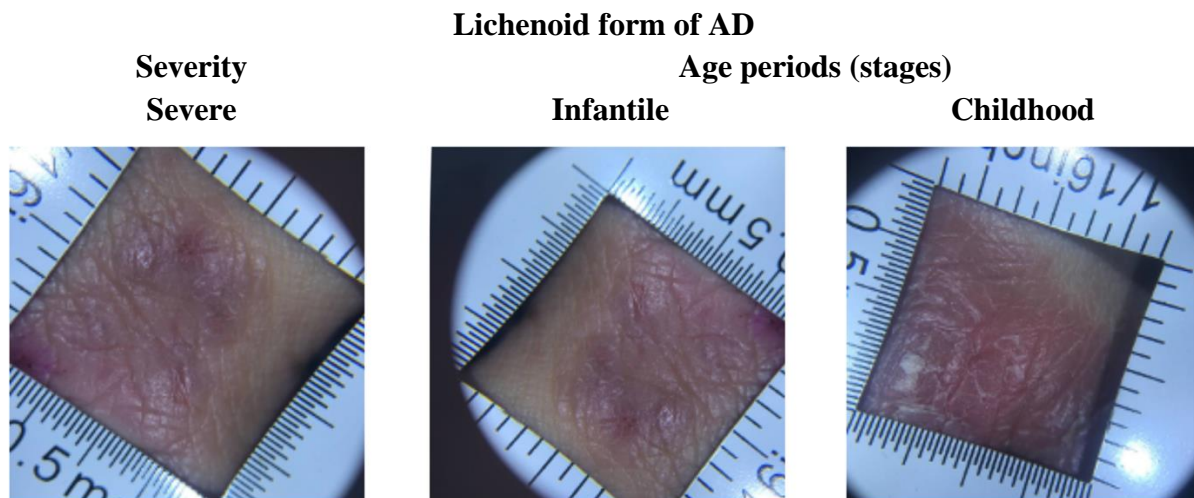


**Figure 4.**

**Lichenoid form of AD** is characterized by dry foci of pale pink color with indistinct borders, with less pronounced erythema and vascular pattern in the form of dots or linearly convoluted vessels, grayish-dirty inclusions (lichenification) distributed throughout the focus,

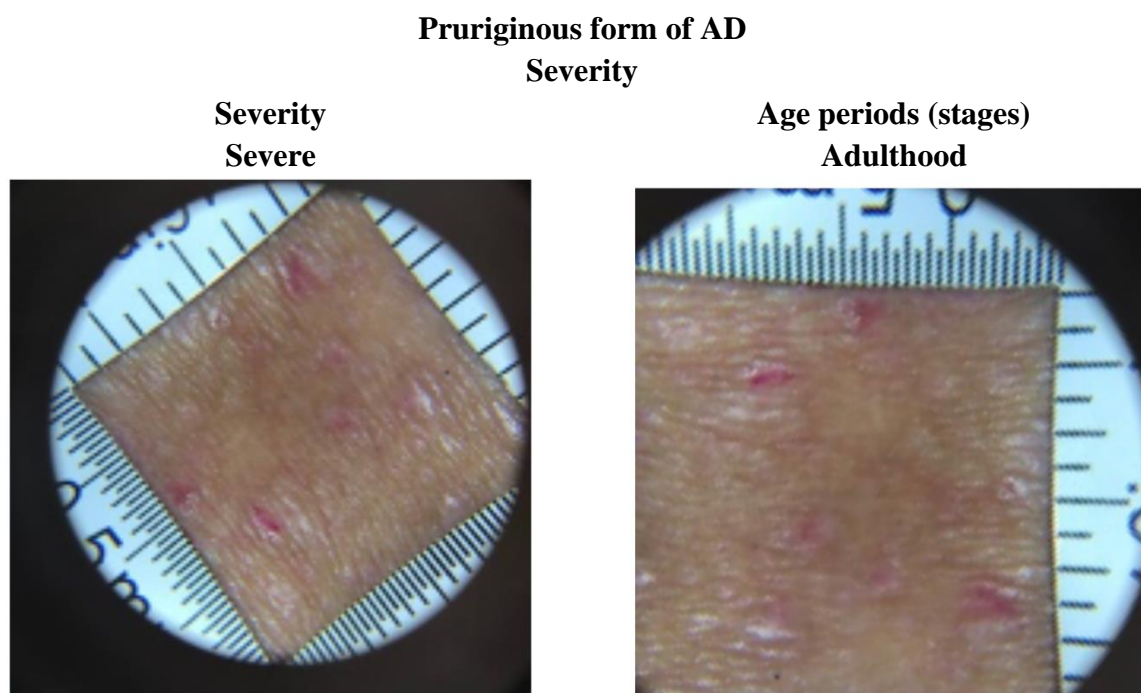


having various external manifestations in the form of linear, rounded, mesh or ring-shaped structures (Figure 5).



**Figure 5.**

**Pruriginous form of AD** is characterized by the presence of dry dark red foci consisting of dense conical or hemispherical papules with clear boundaries against a background of moderate erythema, with a less pronounced vascular pattern with focal distribution of vascular structures, the vascular network in which takes a glomerular appearance and grayish-brown inclusions and crusts distributed along the periphery of the focus. The appearance of spot hemorrhages in this form is the result of scratching and itching (Figure 6).



**Figure 6.**

Thus, according to dermatoscopy data, it can be concluded that there are several variants of skin damage against the background of atopic dermatitis, namely exudative, erythematous-squamous erythematous-squamous with lichenification, lichenoid, pruriginous. These data complement the classical clinical forms of the disease. At the same time, the severity of skin

changes depended on the severity of the clinical course of atopic dermatitis according to the SCORAD scale.

Considering the above, we can conclude that the dermatoscopy method allowed us to clarify the diagnosis of the existing disease, especially in cases where the anamnestic and clinical signs of the disease were similar.

**Conclusion.** Thus, in this paper, the diagnostic value of dermatoscopy in AD in children is demonstrated by the example of cases from clinical practice. This objective skin research technique allows you to study the structure of the skin in vivo in real time and complements the classic clinical manifestations of the disease. The main purpose of using skin dermatoscopy is to study the microstructure of the skin in normal and pathological conditions, to diagnose the configurations of skin morphology with the specification of boundaries. Comparison of the results of dermatoscopy of the clinical picture increases the reliability of the data acquired during the examination. Dermatoscopy should be used in the therapeutic and diagnostic process to verify and clarify the clinical diagnosis, control and evaluate the effectiveness of treatment. The use of dermatoscopy does not require special training of the patient, has no contraindications.

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## HEREDITY, ALLERGOANAMNESIS AND SEASONALITY IN THE DEVELOPMENT AND COURSE OF ATOPIC DERMATITIS IN CHILDREN

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<https://doi.org/10.5281/zenodo.8185632>

**Abstract.** *Heredity, allergen anamnesis and seasonality of the disease were studied in 126 children with atopic dermatitis (AD) aged 3 months to 17 years. In many children with AD, worsening of the allergic history is a predictor of the development of atopic dermatitis. At the same time, the analysis of allergopathology among the patients' stomachs revealed that pollinosis (allergic rhinitis) is mainly found. It should also be noted that atopic dermatitis in children is characterized by recurrence and exacerbation of the disease in most cases in the autumn-winter season.*

**Keywords:** *atopic dermatitis, children, allergy history, heredity, seasonality.*

The problem of allergic skin lesions in children is currently one of the most urgent in the practice of dermatologists and pediatricians [12, 13]. Among allergic skin diseases in children, one of the leading places is occupied by atopic dermatitis (AD), the prevalence of which, according to epidemiological studies, ranges from 17 to 25% [6, 7].

A large number of epidemiological studies indicate a higher incidence of allergic diseases in cities compared to rural areas, as well as in economically developed countries compared to countries with developing economies [10, 11].

The high prevalence of atopic dermatitis in the pediatric population, the further growth of its severe forms, the tendency to chronic course, insufficiently studied biomedical and socio-hygienic factors of development determine the relevance of this problem [8, 9].

Atopic dermatitis is a chronic allergic disease that develops in individuals with a genetic predisposition to atopy, having a recurrent course with age—related features of clinical manifestations [1, 3].

Currently, the issues of pathogenesis, diagnosis and treatment of atopic dermatitis in children remain poorly understood [2]. An urgent problem is the study of the influence of heredity and seasonality on the development, clinical course and outcome of the disease [4, 5]. Assessment of the nature of predisposition taking into account the allergoanamnesis and the study of seasonality is relevant in the study of this problem [13, 14].

This state of affairs dictates the need for research aimed at studying heredity, allergoanamnesis and seasonality in the development and course of atopic dermatitis in children.



**The purpose of the study.** To study the features of hereditary predisposition, allergeoanamnesis and seasonality in the development and course of atopic dermatitis in children.

**Research materials and methods.** 126 children with various forms of atopic dermatitis aged from 3 months to 17 years who received inpatient treatment in the dermatological department of the Tashkent Pediatric Medical Institute clinic were examined. 64 (50.8%) of the subjects were boys and 62 (49.2%) were girls. To study the features of hereditary predisposition, allergeoanamnesis and seasonality in the development and course of atopic dermatitis, an anamnestic study was conducted for the presence of allergic (atopic) diseases in relatives of children with AD and seasonality during exacerbations of the disease.

**Research results.** The analysis of morbidity among relatives of patients showed the presence of allergic (atopic) diseases of the fathers of 12 children (9.5%), mothers of 15 children (11.9%) of patients, 13 patients (10.3%) had the incidence of grandfather, 7 (5.6%) – grandmother, 14 (11.1%) – uncle, 11 (8.7%) – from an aunt. In 6 (4.8%) children, siblings suffered from the disease. Morbidity in distant relatives on the paternal and maternal lines was observed in 9 (7.1%) children. 39 children (31.0%) did not have a burdened heredity for allergic diseases (Table 1).

**Table 1**

**Incidence of allergic (atopic) diseases among relatives of sick children**

Relatives suffering from allergic (atopic) diseases	Boys		Girls		Total	
	abs.	%	abs.	%	abs.	%
Father	4	3,17	8	6,35	12	9,52
Mother	5	3,97	10	7,93	15	11,9
Sisters	3	2,38	1	0,79	4	3,17
Brothers	1	0,79	1	0,79	2	1,58
Grandfather	5	3,97	8	6,35	13	10,3
Grandmother	3	2,38	4	3,17	7	5,6
Aunt	3	2,38	8	6,35	11	8,73
Uncle	4	3,17	10	7,93	14	11,1
Distant relatives	3	2,38	6	4,75	9	7,13
<b>Total</b>	<b>29</b>	<b>23,0</b>	<b>58</b>	<b>46,0</b>	<b>87</b>	<b>69,0</b>

In total, 87 (69.0%) patients had the presence of hereditary burden of allergic (atopic) diseases.

The analysis of allergopathology in relatives of AD patients on the basis of the collected anamnesis data allowed us to establish that among allergic (atopic) diseases, pollinosis (allergic rhinitis) was more often registered – in relatives of 47 (37.3%) children, chronic urticaria – in relatives of 18 (14.3%) patients, allergic bronchitis with an asthmoid component – in relatives of 13 (10.3%) and allergic conjunctivitis – in relatives of 9 (7.1%) patients (Table 2).

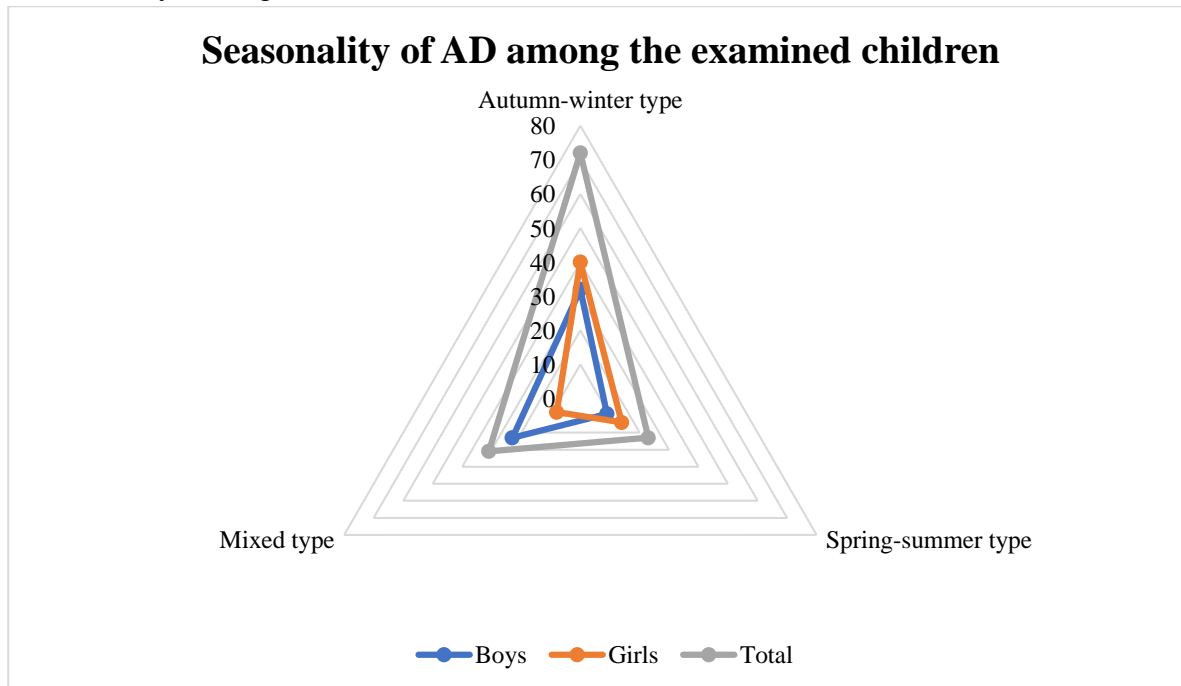
**Table 2**

**Analysis of allergopathology in relatives of children with AD**

№	Pathology	abs.	%
1.	Allergic conjunctivitis	9	7,1
2.	Pollinosis (allergic rhinitis)	47	37,3
3.	Allergic bronchitis with an asthmoid component	13	10,3

4.	Chronic urticaria	18	14,3
	<b>Total</b>	<b>87</b>	<b>69,0</b>

The study of the peculiarities of the seasonality of the disease showed that 72 (57.14%) children with AD had an exacerbation in the autumn-winter period, 23 (18.25%) patients in the spring-summer period and only 31 (24.6%) patients had an exacerbation of the disease regardless of the time of year (Figure 1).



**Figure 1**

**Conclusion.** The data obtained indicate that in most cases, a burdened allergic anamnesis is a predictor of the development of atopic dermatitis in children. At the same time, the analysis of allergopathology in relatives of patients showed that the presence of pollinosis (allergic rhinitis) was most often found in relatives of children with AD. Also, it is worth noting that not burdened heredity for allergic (atopic) diseases does not exclude the development of this dermatosis in children.

In addition, atopic dermatitis in children is characterized by the presence of seasonality of exacerbations with deterioration in the cold season. Thus, the study showed that the majority of children with AD had an exacerbation in the autumn-winter period. It was found that in patients admitted to the hospital with an exacerbation of the disease in the low-sun ("cold") months (from October to March), the disease proceeded with more pronounced symptoms and deterioration of the skin-pathological process.

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# INSECTICIDAL EFFECT OF BACILLUS THURINGIENSIS STRAINS AGAINST THE COTTON BOLLWORM (*HELICOVERPA (HELIOTHIS) ARMIGERA* HBN), WHICH CAUSES A SERIOUS THREAT TO COTTON CROPS

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<https://doi.org/10.5281/zenodo.8185641>

**Abstract.** Members of the Noctuidae family live in a variety of environments, and many species of this group are important agricultural pests, with one being *Helicoverpa armigera* Hbn. *Bacillus thuringiensis* strains 18fo, 31, 84, and 93, a safe alternative to broad-spectrum chemical insecticides for the control of major pests such as *H.armigera* due to environmental and regulatory concerns, were evaluated for their insecticidal activity against the second ( $L_2$ ) and fourth ( $L_4$ ) larval stages of the pest. According to the results of the research, Bt-18fo, Bt-93 and Bt-31 strains showed higher entomopathogenic activity on  $L_2$ -year-old larvae than  $L_4$ -year-old larvae of the pest, while Bt-84 strain was found to have low insecticidal activity.

**Keywords:** *Bacillus thuringiensis*, bacterium, insecticidal activity, *Helicoverpa armigera*, polyphagous, larva, spore, crystal, toxin.

**Introduction.** Cotton (*Gossypium hirsutum*) is a major source of fiber for textile industry, biofuel seed and oilseed production. USA, Pakistan, Brazil and Australia are leaders in cotton production. Pests and diseases cause 30% - 50% economic losses to cotton [2,3,15].

*Helicoverpa armigera* Hbn (*Lepidoptera: Noctuidae*) is a polyphagous phytophagous plant that infects about 200 plant species, including major crops such as cotton, corn, tomato, sunflower, soybean, pea, bean, and many others. Often 50-60% of crops are destroyed by this pest, resulting in a significant reduction in yield. [5,16,26].

Entomopathogenic drugs based on *Bacillus thuringiensis* (Bt) bacteria play a key role in biological protection of plants. The share of Bt in the global biopesticides market is about 85-90%. Over 50 years of toxicological studies worldwide have demonstrated the safety of Bt and its metabolites, including insecticidal proteins and other substances, allowing them to be widely used in plant protection practices [24].

*Bacillus thuringiensis* is a gram-positive, rod-shaped, spore-forming soil bacterium that is found in a variety of terrestrial ecosystems, including soil, water, dead insects, leaves of deciduous trees, endophytes of some plants, and milk. meeting is recorded [13].

*B. thuringiensis* bacteria produce a wide range of insecticidal proteins and are active against the larvae of various groups of insects, and sometimes it has been observed that they affect other types of insects. Strains belonging to the *B.thuringiensis* group produce protein-containing crystal (Cry) toxins during growth and development, and some strains produce cytolytic (Cyt) toxins,  $\alpha$ - $\beta$ - $\gamma$  exotoxins, and Vip toxins. This, in turn, explains why products made on the basis of these bacteria become the most sold biological insecticides in the world today [14], for example, due to

the presence and use of genes encoding insecticidal proteins, it is possible to create new types of transgenic plants. [15].

In laboratory conditions, *B. thuringiensis* (Bt) strains showed 40.0 to 83.3% insecticidal activity against the cotton bollworm *Helicoverpa armigera*. Cotton yield increased by 2.4% compared to the control [19], when Bt and NPV were tested together against second and fourth instar larvae, larval susceptibility was reduced in adults, as second instar compared to fourth instar larvae (95,45%) recorded more deaths [12,23].

Several studies have shown that transgenic cotton plants containing Bt toxin genes are resistant to cotton blight, as observed in experiments [7,18], which were first conducted in the mid-1990s. The US company Monsanto has transgenic the *Bacillus thuringiensis* (Bt) gene into the cotton plant and commercialized it in cotton producing countries. Transgenic cotton killed some voracious insect pests and increased yield without harming the environment or human health [6,15], resulting in a reduction of more than 331 million tons of insecticide active ingredient. Transgenic cotton is highly selective, effective against many major *Lepidoptera* pests, environmentally friendly, and has become an important part of pest management (IPM) [10].

#### **Research materials and methods.**

Our research was carried out in the molecular biology laboratory of the 2023 Institute of Microbiology. An experiment was conducted to determine the biological effectiveness of *Bacillus thuringiensis* 18fo, 31, 84, 93 strains available in the institute's collection against the II- and IV-instar larvae (L<sub>2</sub>-L<sub>4</sub>) of the bollworm (*Helicoverpa armigera* Hbn) in laboratory conditions.

0.5 in a liquid solution to determine the effect of *B. thuringiensis* strains in 3 repetitions against the larvae of the 5 variants of the bollworm grown in laboratory conditions; 1.0%, that is, 10 ml of the strain was added to 1 liter of water, and 5 ml of the strain was added to 1 liter of water, and 0.5% was treated. The concentration of the solution of the bacterial strains used in the experiment was 1.0 µg ml<sup>-1</sup> 2x10<sup>8</sup> in 1 ml and 0.001 ml of T-34 insecticide preparation was taken as a sample. Small-leaved sorrel (*Rumex crispus* L) and sedge (*Rumex acetosa* L) for larval feeding. We used the leaves of plants.

The plant leaves were kept at 4°C until the pest treatment in the laboratory. For isolation, the leaves are first washed with running water and dried for 10 minutes. A small piece (3 cm) is cut from the center of the leaf with sterilized scissors, then surface sterilized with 70% ethanol alcohol for 2 minutes and rinsed 3 times in sterilized water and dried for 10-15 minutes. Placed in cups and suspended in Bt strains. Bt toxins attach to specific binding sites in the midgut of insects, causing cell lysis. This lysis causes the insect to stop feeding and eventually die [9].

Larvae were fed on infected leaves for 48 h. Mortality was recorded every 48 h until pupation for both larval instars. Larvae were considered dead when probed with a blunt needle and unable to move [8].

The control variant was treated with water. The pests in the cups were placed in thermostats and kept at the same temperature and humidity. The experiments were kept at a temperature of 22-25 °C and a humidity of 45-50%.

Laboratory testing of new protective agents against pests of industrial crops was carried out using Khojayev's (2004) methodological manual [23], larval mortality was recorded before the experiment and 3, 5, 7, 10 and 14 days after the experiment. Pest Monitoring Bey-Biyenko (1965-69); Bondarenko (1978) and Volkov (1955) [17,18,19,20].

In laboratory experiments, biological efficiency was determined according to Abbot's formula (1925) [1].  $B_s = (Ab - Ba) / Ab \times 100\%$

$B_s$  - biological effectiveness,

$A$  is the number of pests before treatment in the experimental option;

$a$ - the number of pests observed in the days after treatment;

$B$ - the number (density) of the pest before treatment in the control (unsprayed) option;

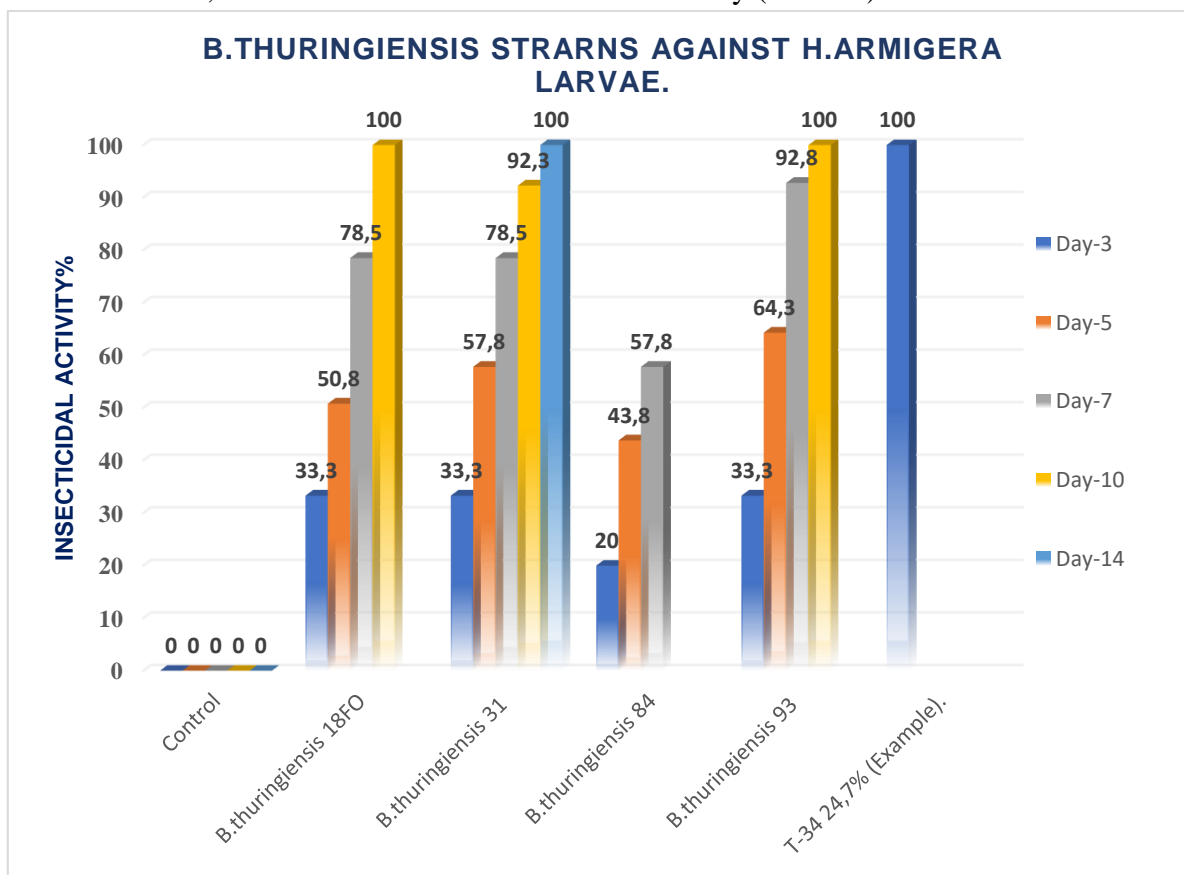
$b$ - in the control option, the number of pests observed in the following days.

**Research results and their discussion.**

0.5 local strains of *Bacillus thuringiensis* 18fo, 31, 84, 93 against L<sub>2</sub> and L<sub>4</sub> larvae of bollworm or cotton bollworm (*Helicoverpa armigera* Hbn); It was treated at a concentration of 1.0%. After treatment with strains, live pest larvae were counted on days 3, 5, 7, 10 and 14, and biological efficiency was determined.

*Bacillus thuringiensis* 18fo strain against L<sub>2</sub> larvae of *H.armigera* was treated with food at a concentration of 1.0%, the effectiveness of the strain was 33.3% on 3 days, 50.8% on 5th day, 78.5% on 7th day, 10th day It was 100% fatal.

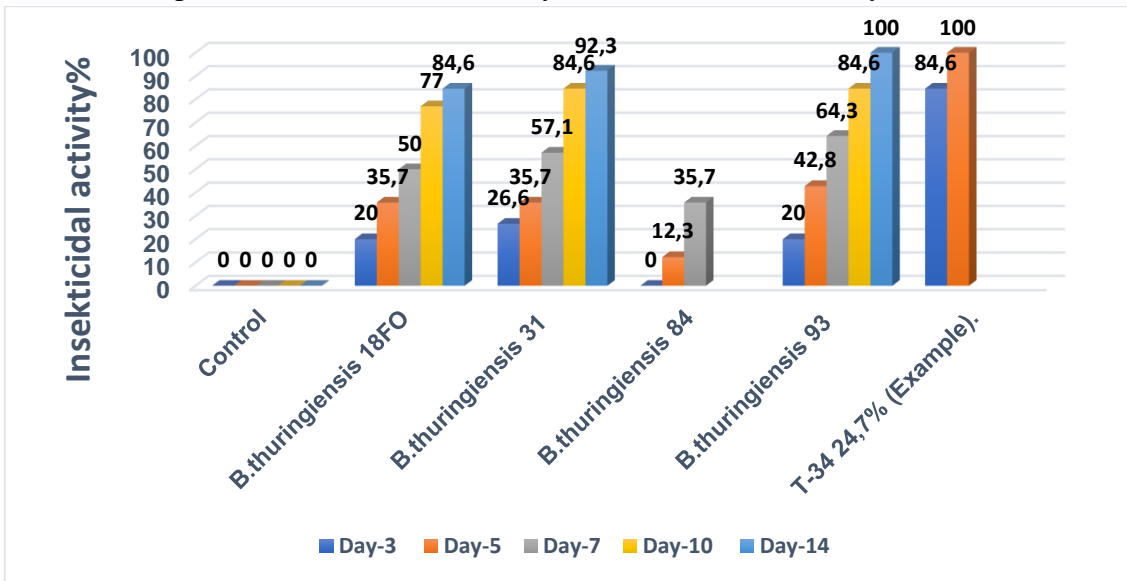
In strain Bt-31, 33.3% mortality, 57.8% mortality on 5th day, 78.5% mortality on 7th day, 92.3% mortality on 10th day, and 100% mortality on 14th day. In strain Bt-84, 3 days showed 20.0%, 5th day 43.8% and 7th day 57.8%. In strain Bt-93, 3 days was 33.3%, 5th day was 64.3%, 7th day was 92.8%, and 10th day was 100% death. When 0.001 ml of the T-34 insecticide used as a model was used, 100% death was observed on the 3rd day (Table-1).



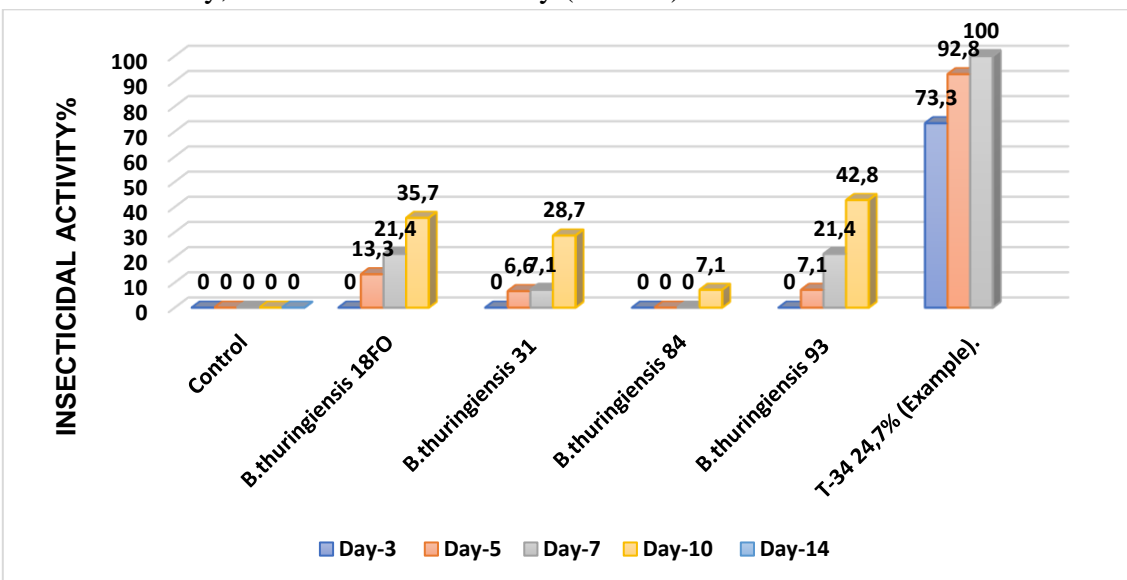
When treated against L<sub>2</sub> larvae of *H.armigera* at a concentration of 0.5%, strain 18fo was 20.0% on 3 days, 35.7% on 5th day, 50.0% on 7th day, 77.0% on 10th day, 14 and on -day it was 84.6%. In strain Bt-31, it was 26.6% on day 3, 35.7% on day 5, 57.1% on day 7, 84.6% on day 10, and 92.3% on day 14. In strain Bt-84, it was 14.3% on the 5th day and 35.7% on the 7th day. In



strain Bt-93, 20.0% on 3 days, 42.8% on 5th day, 64.3% on 7th day, 84.6% on 10th day and 100% on 14th day. When 0.0005 ml of chemical preparation T-34 was used as a template, it was observed that 84.6% of the pest was killed on the 3rd day and 100% on the 5th day (Table 2).



Only 1.0% concentration of *B. thuringiensis* strains against L<sub>4</sub> larvae of *H.armigera* was treated. The efficiency of Bt-18fo strain was 13.3% on 5th day, 21.4% on 7th day, 35.7% on 10th day and death. In strain Bt-31, 5th day was 6.6%, 7th day was 7.1%, 10th day was 28.7%. The Bt-84 strain showed 7.1% insecticidal activity only on the 10th day, while the Bt-93 strain showed 7.0% efficiency on 5 days, 21.4% on the 7th day, and 42.8% on the 10th day. did When 0.001 ml of the T-34 insecticide used as a model was used, it was observed that 73.3% died on the 3rd day, 92.8% on the 5th day, and 100% on the 7th day (Table 3).



**Conclusion.**

Our present study revealed that when the efficacy of different local strains of *Bacillus thuringiensis* was studied as an alternative to control *H.armigera*, two-year-old (L<sub>2</sub>) larvae at 1.0% concentration had higher insecticidal efficacy than four-year-old (L<sub>4</sub>) larvae. it has been. Therefore, the use of *Bacillus thuringiensis* strains against two-year-old (L<sub>2</sub>) larvae of *H. armigera* shows high insecticidal activity.

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## IMPROVING THE APPLICATION OF EDUCATIONAL TECHNOLOGIES TO THE EDUCATIONAL PROCESS OF UROLOGY

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<https://doi.org/10.5281/zenodo.8193441>

**Abstract.** *This article covers the problems and relevance of improving the application of innovative technologies to the educational process of Urology for students of the urology direction of the medical institution.*

**Keywords:** *frame, profession, training, education, process, improvement, medical high school, students, urology science, innovation, simulation, technology.*

Information on the integration of modern information communication technologies into the field of education and medicine, current problems in the social sphere and news are analyzed by educators and transmitted to the minds of those who receive education, relying on professional skills. The acceleration of the development process requires various approaches that should be applied not only in the professional activities of pedagogical personnel, but also in the professional activities of specialists working in the field of Medicine[1].

Professor of Medical Sciences Selchuk Yuzhel says about urological diseases. "According to statistics, prostate adenoma is the most common disease, occurring in every sixth man. In the "risk group" - people over 50 years old. The reason for the development of prostate adenoma is hormonal disorders that are observed in the body of men as they age. Subsequent cases of kidney cancer, gallbladder cancer, inability to hold the bladder, erectile dysfunction (impotence) may be noted. Children, on the other hand, are often disturbed by kidney disease and infections in the pubic tract"[3] he says.

As with other areas of reproductive health, it is necessary that the parents of children, especially boys, are very attentive to care about childhood, to identify or treat the disease at the initial stage of development. If the child has difficulty getting involved or, on the contrary, often gets out there, this can be enough grounds to see a doctor. If the child has noticed that the way out of the forehead is not in its place, it is necessary to consult a specialist. When bathing a child, it is necessary to pay attention to whether his testicles have completely fallen or not. If one of the testicles has not completely fallen off, this can lead to infertility in the future. If the testicles are trapped inside the body, it leads to the development of cancer. It should also be said that if the child has a kidney or a stone in the gallbladder, he will begin to complain of abdominal pain.

In children, the pain in the formation of a stone is different from that of an adult, and its heat can come out and press tremors. In case of such signs, it is necessary to extend the referral to the doctors of practice. In addition, if the disease is Hereditary, the chances of its development will be higher.

The above signs for the health of young parents or children caregivers need to see a doctor and undergo an Ultra-sound examination, which allows you to identify the tumor at an early stage. Not only young children, no matter how old a person is, he must pass the Ultra-sound examination once a year. In everyday conditions, I recommend reducing salt from the ration in consumption,

not drinking carbonated drinks, lemonades, and not orange-colored fruits. This has a negative effect on the urinary tract system. Currently, prostate adenomas occur in many people to the future doctor we can see ways to eliminate them as follows. There are no preventive methods of prostate adenoma. However, you can prevent prostate cancer. To do this, men over 50 years of age are recommended to perform an appearance and blood analysis at least once a year to a urologist-doctor. Prostate cancer is the second largest cancer in the world in terms of the number of people affected, after lung cancer.

When modern examination tools are used, effective treatment in determining the problem accurately and based on this will help for treatments. Advanced diagnostic tools allow urologist doctors to diagnose diseases in the early stages.

Treatment technologies are also of great importance. urology, especially Pediatric Urology, is a very delicate field that requires high accuracy from doctors. Offers minimally invasive urological operas using new medical technologies. Such operas are more effective and less traumatic, unlike traditional methods.

In such operas, surgical intervention is carried out through several small incisions around one centimeter. Therefore, children practically do not feel pain, they do not have traces of large scars, as in ordinary operas, while the recovery period is significantly reduced, as a result of which children will soon be able to return to their homes. One example is the latest generation technology, the Da Vinci robot. He is making it possible to achieve great success in conducting urological operas in patients. This is a unique technological equipment that performs its most complex operas with maximum accuracy under the management of a surgeon. This robot is much more accurate and faster than the human hand. He can also reach places where doctors cannot get out of the way, where it is most difficult to reach. At the same time, the device reflects an even ten-fold enlarged image of the area under Operation. Operas with his participation are performed in a minimally invasive way.

The teacher must strictly observe a number of conditions, using personally oriented types of education in the learning process.

A feature of personally oriented education is the recognition of the student, the creation of a favorable, necessary environment for his comprehensive development.

- consider each student as a separate person;
- respect the student;
- direct assessment of a student's mental state;
- take into account the wishes, interests of the student;
- tolerant attitude towards each student;
- confidence of the student in strength, opportunities and aspirations;
- creating a favorable educational environment so that each student can sufficiently master the basics of educational disciplines;
- creating an opportunity for free employment of students in independent or subgroups;
- train students to independently monitor their activities, determine the effectiveness of activities, analyze achievement factors and consequences of mistakes;
- exert pressure on each student in the course of study;
- do not identify the shortcomings of an individual student;
- if the student records the inability to master knowledge, inadequate well-being in the learning process, then without sharp conclusions to identify the causes;

- eliminate on the basis of the identified reasons such cases as inability to master knowledge, inadequate well-being of the student without causing harm to his pride;
- create an "atmosphere of success" for each student in the learning process;
- help every student succeed in learning;
- increasing the student's abilities, promoting his development as a person;
- evaluate not the student's identity, but his specific actions;
- as an educator should gain the respect and trust of every student.

Personally oriented education does not provide for the student's adaptation to the education system, but, on the contrary, the creation of the necessary conditions for his comprehensive development, taking into account individual characteristics, the formation of the person. Education of this kind allows students to independently develop, gain independent knowledge, fully demonstrate their internal capabilities, abilities, create the necessary conditions for increasing cognitive activity.

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In the process of personally oriented training, students will receive a creative, critical approach to mastering educational material, the opportunity to promote new ideas, justify them, defend their opinion, find an effective solution in problem situations, master knowledge, skills, skills. The teacher's use in the educational process of various active methods of an innovative nature contributes to the development of students, the further development of their abilities. In particular:

- problem search;
- conducting small studies;
- debate;



- discussion;
- heuristic conversation;
- work in subgroups, etc.

When organizing classes, teachers should pay special attention to ensuring that educational information can interest students, based on their knowledge, skills, skills and experience, stimulate them to think, creative approach. Teachers in the process of training conduct:

- effective, targeted use of various forms, methods, means and technologies;
- provide students with the opportunity to independently choose methods when performing educational tasks;
- ensure the student's work in a pair, subgroup and team;
- drawing attention to the design of classes will not only improve the quality of training, increase its effectiveness, but also create favorable conditions for personal development.

It is important that teachers pay attention not only to the informational, but also to the developing nature of training. In addition, one of the important features of learning is the possibility of independent statements by students on the topic under discussion, a problem studied by the topic (although incorrect, but opinion), in any case pushing them to think and think.

Another sign of personally oriented education is the use in the learning process:

- creative tasks;
- tasks that require a creative approach;
- problem situations;
- role-playing and business games;
- discussion, debate;
- competitions in the form of competitions

Uzbekistan and foreign professors regularly conduct seminars and consultations, as well as exchange experience on new methods of diagnosis and treatment of diseases. The high professional level of urologist doctors from Uzbekistan is excellent, but sometimes the necessary technologies are lacking for their accurate diagnosis. In order to bring this direction to the gorge of modern demand, great attention should be paid to the development of the technological base, directing large investments in the purchase of expensive diagnostic and treatment equipment from abroad for urology departments.

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## METHODOLOGY OF REMOTE ORGANIZATION OF THEORETICAL AND PRACTICAL TRAINING OF FUTURE AGRICULTURAL SPECIALISTS

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<https://doi.org/10.5281/zenodo.8193465>

**Abstract.** *The article describes the educational system organized on the basis of the conditions of distance education and its structural purpose, content, methods, tools and organizational forms of the distance education system.*

**Keywords:** *qualified personnel, competence, education, distance education, technology, pedagogical technologies, principle and integrated education.*

In the Action Strategy for the further development of the Republic of Uzbekistan, important tasks such as "Increasing the quality and efficiency of higher education institutions based on the introduction of international standards for assessing the quality of education and teaching" were defined.

In the coordination and improvement of educational processes with modern developments, the professional training of future agricultural specialists, that is, their professionalism and competence, is specially recognized. Because the modern requirements for ensuring the effectiveness of the processes of training qualified personnel also include the effective organization of innovative and integrated educational processes that serve to form and develop the professional competence of future specialists, including the distance education methodology.

In distance education, the learner and the teacher are in constant communication with the help of specially created educational courses, control forms, electronic communication and other technologies of the Internet, while being spatially separated from each other. Distance education based on the use of Internet technology provides access to the world information and education network.

Distance learning provides an opportunity for all those who want to learn to continuously improve their skills. In the course of such training, the learner learns independent teaching and methodical materials in an interactive mode, passes control, performs control work under the direct guidance of the teacher, and communicates with other learners of the "vertical learning group" in the group.

Various information and communication technologies are used in distance education. For example, if traditional print-based teaching tools (study guide, textbooks) are based on introducing students to new material, interactive audio and video conferences are designed to communicate over a certain period of time, to establish direct and reverse e-mail communication, that is, to send and receive messages. Pre-recorded video lectures allow learners to listen and watch lectures, while fax communication, instant exchange of messages, assignments over the network allows learners to learn through mutual feedback.

The organization of video communications through telecommunications and computer networks, their formation as a means of distance education is a new methodical and technical

training system is creating an opportunity to implement its provision. High-quality video communication is one of the most reliable means of organizing video seminars and video conferences using a computer. Such tools are of great importance in distance training of pedagogues-teachers, in particular, in solving problems related to educational issues with a group of several dozen people, as they provide individual training, methodical support, and effective implementation of innovative technologies. In addition to the listeners' communication through voice and video images, there are opportunities to manage the images on the computer monitor in cooperation with the listener and the pedagogue.

In distance education, this principle is interpreted as the principle of creative description of the listener's cognitive activity. Creative information technology has an interactive nature and requires the listener to apply the description of the received general information to specific situations. The implementation of the scientific principle of teaching in the process of distance education assumes that students will master scientific evidence, concepts and laws, and theories on the content of a certain subject. The scientific principle requires students to develop the skills of scientific research. For this, it is necessary to widely use problem-based educational methods in laboratory and practical training of agricultural sciences. The successful implementation of this principle in distance education serves to ensure the fundamentality of acquired knowledge.

In distance education, the principle of matching the content and complexity of educational materials to the student's level serves to ensure that the students acquire the planned knowledge, skills and competences without mental and physical overload. The principle of taking into account the individual characteristics of the listeners is of great importance in the organization of distance education, and ensures that the structure of the module of distance courses takes into account the psychophysiological, psychological, psychosociological individual characteristics of the listener. The principle of demonstrability means increasing the effectiveness of education by affecting all the senses of a person in education. In distance education, this principle is mainly provided by means of virtualization technology. In particular, it envisages wide use of video films, educational computer programs, and interactive technologies. Demonstration materials and the method of using multimedia tests are widely used and important tools of the principle of demonstration in distance education.

The following are recommended as effective forms of teaching in distance education:

- Online problem lecture;
- video lectures, webinars;
- Online and Offline binary lecture;
- Online and Offline intensive-interactive seminar;
- Remote video training;
- Online interactive tour; seminars; presentation, work in small groups, etc.

It is recommended to use technical tools, express questions, test questions, brainstorming, group thinking, working with small groups, "Insert", "FSMU", "Case", "SWOT-analysis" technology and other interactive educational methods.

In distance education, the necessary tools for theoretical and practical training may consist of the following;

- Blackboard.
- Flipchart.
- Presentation slides.

- Handouts.
- Multimedia set (netbook, TV).
- “Case bank”.
- Textbooks (traditional textbooks, electronic textbooks, manuals, reference books, etc.).
- Educational and methodological manuals in the (computer) network;
- Computer training systems in conventional and multimedia versions;
- Audio and educational information materials;
- Video educational materials;
- Remote laboratory practicums;
- Remote trainers;
- Remote information and knowledge base;
- Remote electronic libraries;
- Teaching tools based on teaching expert systems;
- Educational tools based on geoinformation systems;
- Teaching tools based on virtual reality.

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# IMPROVEMENT OF THE TECHNICAL ELEMENTS OF COTTON DRIP IRRIGATION AND STUDYING THE AMOUNT OF MOISTURE IN THE FIELD

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<https://doi.org/10.5281/zenodo.8193482>

**Abstract.** *In order to increase productivity, the use of water-saving irrigation technologies remains one of the important factors, in this sense, the installation of drip irrigation system and its correct use are important for irrigating the cotton crop. In the implementation of these tasks, in order to develop optimal irrigation procedures using the drip irrigation method, it is necessary to carry out irrigation soil moisture in relation to ChDNS in different irrigation procedures. Taking this into account, it is now necessary to prepare the field for drip irrigation based on the conditions and processes in the cotton fields, the soil melioration conditions and the correct distribution of water resources. The main criteria for this are proper phenological observation, proper irrigation system, and control of the level of seepage water.*

**Keywords:** *soil conditions, drip irrigation, salinity, envelope method, tensiometer, pond clarifier, marginal field moisture capacity, geomembrane, pumping device, sand filters, disc filters, distribution pipes.*

**Introduction.** In our republic, special attention is paid to the efficient use of water-saving technologies, especially the drip irrigation technology, and the cultivation of crops. According to the Decree of the President of the Republic of Uzbekistan dated July 10, 2024 No. PD-6024 “On approval of the concept of water management development of the Republic of Uzbekistan for 2020-2030”, the areas where water-saving irrigation technologies are used in our country will be increased to 2 million by 2030. per hectare, according to the Presidential Decree No. PD-5005 of February 24, 2021 “On approval of the strategy for the management of water resources and the development of the irrigation sector in the Republic of Uzbekistan for 2021-2023”, the tasks of rapidly expanding the cultivated areas where the drip irrigation system will be introduced and reaching 800 thousand hectares in 2023 have been set [1].

On the basis of these privileges and opportunities created, water-saving technologies were introduced in 433 thousand hectares of land in 2021, and their 13 total indicators make up 17% of the irrigated areas, 290,300 areas are irrigated based on drip irrigation technologies, 13,500 are sprinkler irrigation technologies, and 13,500 are discrete irrigation technologies. 10.6 thousand, irrigation with the help of flexible pipes 299.7 thousand, 92 thousand using film irrigation technology, land leveling with the help of laser equipment reached 185.8 thousand hectares [2].

**Problem of research.** Most of the operations in overhead irrigation are carried out manually, most importantly, the water needed for agricultural crops is consumed by 25-30% more than the required norm in this method, besides, it is not possible to evenly moisten the active layer of the soil (70-100 cm) on the irrigated crop area. The mineral fertilizers placed in the bottom of the Egat are washed away by water or absorbed into the lower layers, and the level of their use

decreases, excessive irrigation has a negative effect on the meliorational and ecological condition of the soil, and on the work of the collector and drainage networks. In the developed countries of the world, the most modern economical, computerized drip irrigation method has been widely used for irrigation of agricultural crops for many years. According to the results of the scientific research carried out so far, it has been found that drip irrigation can save up to 40-55% of water, reduce labor costs by 1.5-2 times, save mineral fertilizers by 35-40%, and increase cotton yield by 8-10 s/ha.

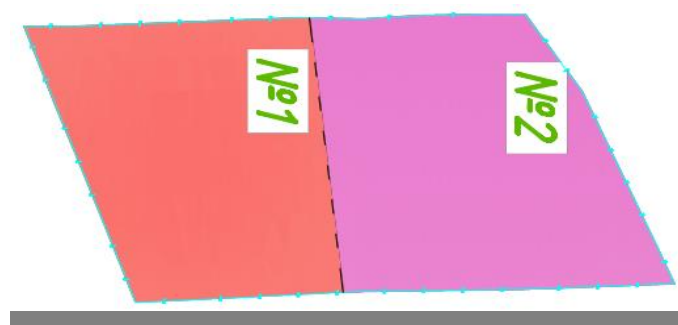
**Research method.** In this case, the method of work was carried out in the field, phenological observations were carried out based on Agrotechnology of care of cotton varieties planted in Fergana region (Research Institute of Breeding, Seed Production and Agricultural Technology of Cotton Growing 2017) and ("Research Institute of Cotton Growing 2007). Design work was carried out on the introduction of drip irrigation technology to 4 hectares of cotton area of the "Sultonbek Yunus Ali ogli" farm, located in the 3 contours of the Dashtpandigon massif, Rishton district, Fergana region (Fig. 1).

A filtering device is a device designed to clean large and small particles in the water used for irrigation to the level required by the water irrigation technology.

The main (main) pipe is an underground or above-ground pipe designed to carry the necessary amount of water from the system pumping device to the distribution pipes.

Distribution pipe - pipes that are laid underground or above the ground to deliver and distribute water from the main pipe to drip irrigation hoses or to distribute water between rows. Drip irrigation hoses are drip hoses that are laid between the rows of crops and are designed to deliver water to the plant root system at a specified rate. The hoses were placed in rows at a distance of 60 cm in soils with medium and heavy mechanical composition, and in each row in soils with light mechanical composition.

In the experiment, the variety of cotton "Namangan-77" was carried out in order to develop optimal irrigation methods using the drip irrigation method, in different irrigation methods, irrigated soil moisture was carried out in 70-70-60 percent, 75-75-65 percent, 80-80-70 percent irrigation methods in relation to ChDNS. In the control options, irrigated soil moisture was irrigated using the conventional irrigation method with 75-75-65 percent of ChDNS in irrigation regimes. Also, in determining the moisture content of the irrigated soil and determining the duration of irrigation, it was established by drying the soil in the calculation layer in a thermostat (105<sup>0</sup>C) for 8 hours in laboratory conditions, and in the 40- and 80-cm layers in the control variants with drip irrigation, and in the drip-irrigated variants with a length of 50 cm.



**Figure 1**

**Research results.** During the research, soil samples were taken to determine the initial agrochemical condition of the soil. In order to determine the amount of humus, total nitrogen and total phosphorus in the soil before drip irrigation, soil samples were taken from 0-30 and 30-50

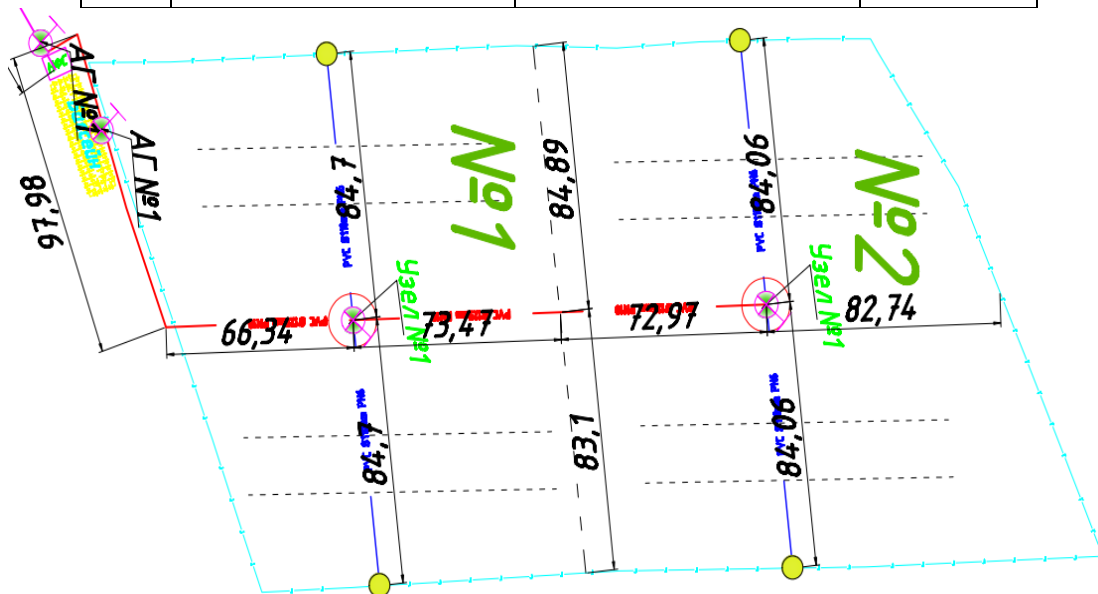


cm layers of plowed and under-plowed soil at 5 points in the spring. According to the samples taken, the composition of soil humus in two parts of the field is as follows:

I-part 1.42% in the 0-30 cm section; 1.25% in 30-50 cm section	II-part 1.65% in the 0-30 cm section; 1.31% in 30-50 cm section
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**Amount of chlorine and dry residue in the soil up to 1 m (Table 1)**

№	Depth, cm	Dry residue	Chlorine
1	10	0,071	0,016
2	20	0,93	0,014
3	30	0,132	0,011
4	40	0,151	0,012
5	50	0,151	0,014
6	60	0,202	0,010
7	70	0,346	0,011
8	80	0,434	0,011
9	90	0,451	0,014
10	100	0,522	0,008



**Figure 2**

**The average moisture content of the soil taken from the field by the envelope method according to the 1st repetition in % (Fig 2)**

Sequence	The depth of the soil obtained (cm)	Container serial number	Weight (grams)					Moisture (%)
			Total weight of soil	Weight after drying	Net weight of the container	Evaporation of water	Net weight of dried soil	
1	2	3	4	5	6	7=4-5	8	9=7/8*100

<b>I</b>	10	1	72,0	66,0	22,0	6,0	44,0	13,6
	20	2	64,0	58,0	22,0	6,0	36,0	16,7
	30	3	68,0	60,0	22,0	8,0	38,0	21,0
	40	4	74,0	68,0	22,0	6,0	46,0	13,0
	50	5	68,0	60,0	22,0	8,0	38,0	21,0
	60	6	72,0	68,0	22,0	4,0	46,0	8,7
	70	7	68,0	64,0	22,0	4,0	42,0	9,5
	80	8	72,0	68,0	22,0	4,0	46,0	8,7
	90	9	70,0	64,0	20,0	6,0	44,0	13,6
	100	10	66,0	58,0	22,0	8,0	36,0	22,2

In order to determine the terms and norms of cotton watering in the experimental field, irrigation was carried out according to the amount of moisture in the layer, 0-50 cm before flowering, 0-50 cm during the flowering period, and 0-50 cm during the ripening period.

In order to determine the terms and norms of cotton irrigation in the experimental field, irrigation was carried out according to the amount of moisture in the layer, 0-50 cm before flowering, 0-50 cm during the flowering-bud period, and 0-50 cm during the ripening period in the considered layer of the soil with drip irrigation (Fig. 2).

### **Conclusion**

One of the most optimal methods is to apply the drip irrigation technique in the case where the soil samples from each crop field have been studied by the previous envelope method. The level of absorption of mineral fertilizers in cotton fields irrigated by the traditional method is 30 percent on average. When crops are drip-irrigated, the level of absorption of mineral fertilizers is 90-95 percent. Optimum humidity for the plant is provided in all areas of the field and conditions are created for its uniform development. In the drip-irrigated options, it was established based on the readings of a 50 cm long tensiometer, and the first irrigation of cotton was carried out. The first cotton picking was done by hand. In the first harvest, 38 centners of cotton were collected. In the second harvest, 2 centners of cotton were picked, and in total, 40 centners of cotton were grown in the season. Only 36 quintals of cotton were picked in the first harvest in our control variant with constant irrigation.

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## STUDY OF PHENOLIC COMPOUNDS IN PLANTS INCLUDED IN THE PLANTAGINACEAE FAMILY

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<https://doi.org/10.5281/zenodo.8200218>

**Abstract.** *The growing demand for phytopreparations makes it possible to expand the range of medicinal plant materials, chemical and pharmacological studies of substances from poorly studied plant species, the creation of medicines based on them and their use in medical practice. In this regard, the purpose of our research is to study the chemical composition of Plantago plants from the Plantaginaceae family, to isolate flavonoids and hydrolysable tannins, to study their chemical structure and biological activity.*

**Keywords:** *Plantaginaceae, Plantago major L., Plantago lanceolata L., chloroform extraction, acetone extraction, ethyl acetate fraction, flavonoids, hydrolysable tannins, ellagitannins, gallotannins.*

Today, the need of human for natural drugs based on medicinal plants is growing day by day. Main herbal drugs, unlike synthetic agents, are characterized by the fact that they can be used for a long time without side effects, showing the property of a wide spectrum of action on the human body.

The growing demand for phyto (herbal) medicines makes it possible to expand the range of medicinal plant materials, chemical and pharmacological studies of substances of poorly studied plant species, the creation of medicines based on them and their usage in medical practice.

In various scientific fields, including pharmaceutics and medicine, more attention worldwide is paid to the search for plant sources which have a huge amount of biologically active compounds and the study of their chemical composition. In particular, carbohydrates, flavonoids, iridoid glucosides, phenolcarboxylic acids and other compounds belonging to plants of the Plantaginaceae family have been isolated, as well as effective preparations based on them are widely used in medical practice.

It is important to study: the chemical composition of Plantago plants (plantains) from this family, the isolation of flavonoids and hydrolysable tannins, their chemical structure and biological activity.

Research studies worldwide have aim to reveal the relationship between the chemical structure and biological activity of polyphenols, their antioxidant and antiviral activities, as well as their mechanism of action, but there is not enough data on plant tannins and their biological activity.

There are more than 250 plantain species in the world, 30 species grow in Asia and 6 in Uzbekistan. *Plantago major* L. and *P. lanceolata* L., belonging to the Plantago family, grow in all regions of Uzbekistan, in fields, arable lands, meadows, forest edges, along streams [1]. In traditional medicine, the plant *Plantago major* L. is used for various purposes. The aerial parts of the plant mainly have wound healing, anti-inflammatory, analgesic, antioxidant, antibacterial, immunomodulatory, hypotensive, hepatoprotective effects. [2, 3, 4.]. The aerial parts of the plant have an anticoagulant effect on ulcers due to alcohol and aspirin. Psyllium extracts stimulate nitric

oxide and tumor necrosis factor (TNF- $\alpha$ ), which resists infection and tumor growth. The main action of nitric oxide is - to inhibit the synthesis of DNA and ATP. Psyllium leaf extracts have antioxidant properties. Flavonoids isolated from plant components have high antioxidant activity [5, 6]

Baicalein isolated from the plant *P. major* L. has hepatoprotective properties, protects the liver of rats from pathogenic pests [8], has the ability to destroy carcinoma cells [9], slows down the growth of human hepatoma cells [10], and has a pronounced antiproliferative property. Scutallarein and baicalein are inhibitors of AIDS transcriptase in vitro. (IC<sub>50</sub> 2,5; 5,6 mM).

**The purpose of the study.** *Plantago major* L. and *P. lanceolata* L. to determine the phenolic compounds of plants and their biological activity.

**Materials and methods.** Plants of *P. major* L. and *P. lanceolata* L. were collected during flowering. The dried raw material was extracted with chloroform to remove lipophilic compounds. Then, the raw material was dried at room temperature until no solvent residue remained, and was extracted three times with 70% aqueous acetone solution. Obtained water-acetone extracts were combined, condensed on a rotary evaporator, and the aqueous concentrate was treated several times with ethyl acetate.

The ethyl acetate fraction was concentrated on a rotary evaporator, dried over anhydrous sodium sulfate (Na<sub>2</sub>SO<sub>4</sub>) and the polyphenol fraction was precipitated with hexane.

When analyzing the polyphenol fraction by paper chromatography using the systems: n-butanol-acetic acid-water 4:1:5 (system 1), n-butanol-acetic acid-water 10:3:7 (system 2), n-butanol -acetic acid-water 4:1:2 (system 3), 15% aqueous solution of acetic acid (system 4) found the presence of 11 compounds in the plant, *P. major* L. and 10 compounds in *P. lanceolata* L. belonging to the class phenols.

To separate the polyphenol fraction into individual compounds, the fraction was washed in a column filled with a specially prepared target powder with a solvent system: diethyl ether, water, and 60% aqueous acetone solution. As the result we got three factions.

After paper chromatography with diethyl ether fraction of both plants, a new substance whose R<sub>f</sub> was 0.51; 0.72 was found (systems 1 and 2, respectively). Distilling off the ether fraction under vacuum, the dry residue was dissolved in a small amount of warm water. As a result, a white crystalline substance precipitated with a melting point of 239°C. This substance was identified by gallic acid.

**Results.** As a result of qualitative reactions (ammonia vapor, sodium carbonate solution), it was found that the aqueous fractions contain compounds belonging to the class of flavonols. According to two-dimensional paper chromatography (systems 2, 4), 5 flavonol compounds were found in plants *P. major* L. and *P. lanceolata* L.

It was found that the 60% water-acetone fraction of the *P. major* L. plant (systems 1, 2) contains 5 compounds, while the *P. lanceolata* L. plant contains 4 compounds belonging to the class of tannins.

Individual compounds were isolated by rechromatography of aqueous fractions isolated from both plants in chloroform-methanol (9:1; 8:2) systems on a polyamide column.

Comparing the results of physicochemical analysis with the data given in the literature, it was found that these substances are quercetin-3-rutinoside (*P. major* L. and *P. lanceolata* L.), 5,7,3', 4'-tetrahydroxy - flavone (*P. major* L.), isorhamnetin (*P. major* L.), quercetin-3-ObD-

galactopyranoside (*P. major* L., *P. lanceolata* L.), 3,5,7,3'4' - pentaoxyflavone (*P. major* L., *P. lanceolata* L.), 3,5,7,4'-tetraoxyflavone (*P. lanceolata* L.), ramnetin (*P. lanceolata* L.).

*Identification of known tannins of P. major L., P. Lanceolata L. plants.* A 60% water-acetone fraction was rechromatographed on a silica gel column in a diethyl ether-ethyl acetate solvent system (in ascending order of ethyl acetate concentration) and separated into individual compounds. The separated fractions were analyzed by TLC and similar fractions were added to each other. As a result, 5 fractions containing individual substances were isolated. Their structure was established by physicochemical methods.

1,2,3,4,6-penta-O-galloyl- $\beta$ -D-glucose (*P. major* L.) - brown amorphous powder, Rf 0.68 (system 2), temp. sq. 278-2800C (with decomposition). UV spectrum (MeOH,  $\lambda_{max}$ , nm): 265, 221. Hydrolysis products in the presence of 5% HCl contain glucose [Rf 0.35 (n-butanol-pyridine-water 6:4:3) System 5, Rf 0.21 (methyl ethyl ketone: acetic acid: methanol, 55:5:2 for TLC) 6-system [1-developer (aniline phthalate reagent)] and gallic acid [Rf 0.51 (system-1)]. Quantitative analysis of hydrolysis products (glucose content was checked by the ferrocyanide method, gallic acid content by colorimetric method) showed that glucose and gallic acid are formed in a ratio of 1:5. Comparing the results with data presented in the literature, this substance was identified as 1,2,3,4,6-penta-O-galloyl- $\beta$ -D-glucose.

1,2,3-tri-O-galloyl- $\beta$ -D-glucose (*P. major* L., *P. lanceolata* L.) - brown amorphous powder, Rf 0.36 (system 2), temp.pl. 267-2690C (decomposed),  $[\alpha]_{20D}$ -70.60 (c 0.1; acetone). UB (MeOH,  $\lambda_{max}$ , nm): 218, 279. Acid hydrolysis in the presence of 5% HCl leads to the formation of glucose and gallic acid in a ratio of 1:3. Based on the obtained results and literature data, this substance was identified as 1,2,3-tri-O-galloyl- $\beta$ -D-glucose.

1,3,4,6-tetra-O-galloyl- $\beta$ -D-glucose (*P. major* L.) - brown amorphous powder, Rf 0.31 (system 2), temp. sq. 273-2750C (with decomposition),  $[\alpha]_{20D}$ -57.30 (s 0.2; EtOH). UV spectrum (EtOH,  $\lambda_{max}$ , nm): 265, 283. IR spectrum (KBr,  $\nu$ , cm<sup>-1</sup>): 3345-3350 (OH), 1710-1730 (ester bond), 1510-1620 cm<sup>-1</sup> (aromatic ring), 1010-1020 (carbohydrate part). The products of acid hydrolysis with 5% HCl solution were glucose and gallic acid in a ratio of 1:4. Analysis of the results of chemical and spectral studies and comparison with the literature data revealed that the substance is 1,3,4,6-tetra-O-galloyl- $\beta$ -D-glucose.

3-O-galloyl-4,6-hexahydroxydiphenol- $\beta$ -D-glucose (*P. lanceolata* L.), - white amorphous powder, Rf 0.68 (system 2),  $[\alpha]_{20D}$  + 400 (c 0.9 ; acetone), UV spectrum (EtOH,  $\lambda_{max}$ , nm): 220, 285. The decomposition reaction products in the presence of HCl were glucose, gallic and ellagic acids [Rf 0.20; 0.01; Systems 2 and 7 (2% aqueous acetic acid solution)]. Comparing the obtained results with the data presented in the literature, the substance was identified with 3-O-galloyl-4,6-hexahydroxydiphenol- $\beta$ -D-glucose.

2,3-di-O-galloyl- $\beta$ -D-glucose (*P. lanceolata* L.) - dark brown amorphous powder, Rf 0.25 (system 2),  $[\alpha]_{20D}$ -1370 (c 0.5; EtOH). UV spectrum (EtOH,  $\lambda_{max}$ , nm): 220, 280. As a result of acid HCl hydrolysis, glucose and gallic acid were obtained in a ratio of 1:2. Comparing the results with the literature data, the substance was identified with 2,3-di-O-galloyl- $\beta$ -D-glucose.

#### **New plant compounds *P. major* L. and *P. lanceolata* L.**

*Diether of hexahydroxydiphenoyl-1-(O-2-O-galloyl- $\beta$ -D-glucopyrano-zido)-1-(O- $\beta$ -D-xylopyranoside) (1)*- isolated from *P. major* L., white amorphous powder,  $[\alpha]_{20D}$  -460 (c 0.5; EtOH), Rf 0.22 (2-system), UV spectrum (EtOH  $\lambda_{max}$ , nm): 225, 283. IR (KBr,  $\nu$ , cm<sup>-1</sup>) spectrum: 3345 -3350 (OH), 1710-1730 (C=O), 1510-1620 (Ar), 1010-1020 (sugar part).

The chemical structure of the diether was established from the data of  $^1\text{H}$ ,  $^{13}\text{C}$  NMR spectra. The  $^1\text{H}$  NMR spectrum shows a signal of the anomeric proton H-1 of xylose in the region of 4.24 ppm. ( $J=7.7$  Hz) in the form of a doublet, hence we can conclude about the  $\beta$ -configuration of this anomeric center. A strong downfield shift of the signal of the anomeric proton indicates the acylation of the OH group of the xylose located in the C-1 atom. Signals characteristic of other xylose protons and appearing at 3.03 (1H, m,  $J=9.3$  Hz, H-2), 3.11 (1H, m,  $J=6.2$  Hz, H-3), 3.26 (1H, m,  $J=9.3$  Hz, H-4), 3.63 ppm (1H, m,  $J=8.5$  Hz, H-5) indicate that the OH groups located in the corresponding positions are not galloized.

In the lower field spectrum, a signal characteristic of the H-1 proton of glucose is observed in the form of a doublet at 6.01 ppm. ( $J=8$  Hz). This confirms that the anomeric center has the  $\beta$ -configuration. The downfield shift of the H-2 signal of the glucose proton ( $\delta$  4.01 ppm) indicates the galloing of the OH group in the C-2 carbon atom. At the same time, the signals of the remaining glucose protons do not change and appear at 4.60 (1H, t,  $J=8$  Hz, H-3), 4.43 (1H, t,  $J=8$  Hz, H-4), 4.64 (1H, m,  $J=12$  Hz, H-5), 4.20 ppm (2H, d,  $J=12$  Hz, H-6). In addition, in the low field spectrum, signals characteristic of the H-3 and H-6 protons of the haloyl group are observed at 7.08; 7.12 ppm as a single. At 6.62; 6.63 ppm signals of protons H-3, H-3' of the hexahydroxydiphenoyl group appear, in the form of a singlet.

These statements are confirmed by  $^{13}\text{C}$  NMR data. Under conditions of complete suppression of spin-spin interaction with protons, typical signals characteristic of carbon atoms of xylose, glucose, gallic and ellagic acids are detected.

Intense signals at 94.9 and 91.3 ppm refer to the C-1 carbon atoms of the sugar moiety of the compound. This indicates that ellagitannin contains two sugar residues, at which the anomeric centers have the  $\beta$ -configuration. At 114.6 and 114.4 ppm signals of C-1, C-1' carbon atoms located in the A and B rings of the hexahydroxydiphenoyl group were observed. The signals of C-7 carbon atoms containing carbonyl groups appear at 166.4-168.7 ppm. Strong signals at 110.0 ppm refer to the C-2 and C-6 carbon atoms of the haloyl group. The signals of carbon atoms C-3 and C-5 match and give relatively strong signals at 145.0 ppm. The C-4 carbon atom of this residue is screened, as a result of the diamagnetic shift it resonates at 139.1 ppm.

Pharmacological and toxicological properties and anti-inflammatory activity of some compounds isolated from plants *Plantago major* L. and *Plantago lanceolata* L. are currently being studied in the laboratory of pharmacology of the Institute of Bioorganic Chemistry.

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## CRANIOCEPHALGIA AND PSYCHO-EMOTIONAL BACKGROUND OF SICK CHILDREN WITH JUVENILE RHEUMATOID ARTHRITIS

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<https://doi.org/10.5281/zenodo.8200286>

**Abstract.** *Chronic progressive JRA disease requires regular examination and long-term treatment, and often leads to the development of psycho-emotional disorders in children and adolescents. Frequent headaches, anxiety, emotional stress, astheno-neurotic reactions contribute to the formation of difficulties in communicating with parents, teachers, healthy peers and, thus, cause social maladaptation.*

**Keywords:** *juvenile rheumatoid arthritis, psycho-emotional state, cephalgia, children.*

**Relevance.** Pediatric juvenile rheumatoid arthritis is a rapidly progressive inflammatory disease that affects the joints in children and adolescents under 16 years of age. The disease is characterized by destructive changes, severe pain syndrome, increasing limitation of motor functions. This condition is almost always associated with extra-articular pathology. Rheumatoid arthritis is diagnosed and treated in a complex way by rheumatologists, infectious disease specialists, pediatricians and other narrow specialists.

Juvenile rheumatoid arthritis remains the most frequently diagnosed disease in pediatric rheumatology. It is accompanied by total damage to the connective tissues, which leads to a narrowing of the joint space, the formation of erosive areas on the surface of the joints, and atrophic changes in the muscle fibers. Rheumatoid arthritis is a systemic disease, and almost all human organs and systems, including nervous tissue, are gradually involved in the pathological process. The pathology of the nervous system in RA leads to an aggravation of disability and a reduction in life expectancy, which is beyond doubt by the vast majority of researchers [1,4,6,7]. Being a chronic progressive disease that requires regular examination and long-term treatment, JRA often leads to the development of psycho-emotional disorders in children and adolescents. Anxiety, emotional stress, astheno-neurotic reactions contribute to the formation of difficulties in communicating with parents, teachers, healthy peers and, thus, cause social maladjustment. The study of the psycho-emotional characteristics of patients with JRA is very important, as it allows to identify their causes, maximally compensate or prevent their occurrence, as well as optimize the interaction of children suffering from this pathology with their immediate environment.

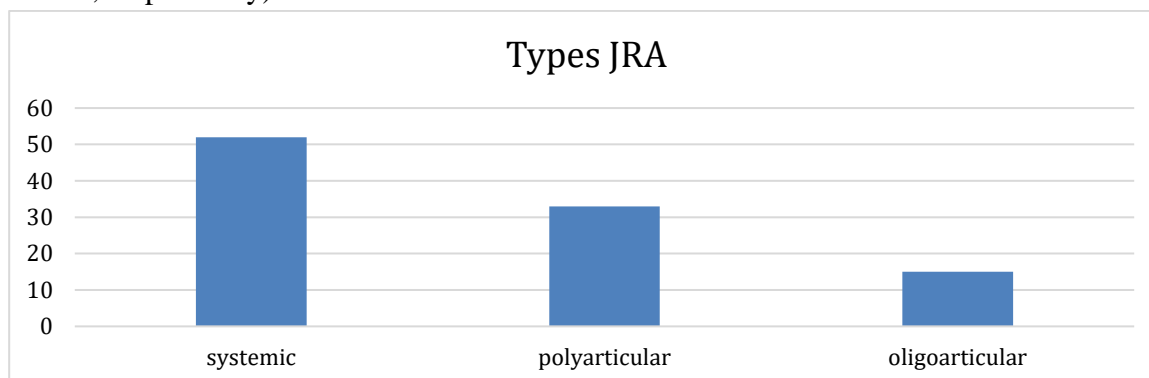
**The aim of our study** was to study the clinical manifestations of cephalgia and the psycho-emotional state of sick children with juvenile rheumatoid arthritis.

**Materials and methods of the study:** The study included 92 (76.3%) children aged 6 to 16 years with various types of headaches in the cardio-rheumatology department of the TashPMI clinic, with a clinical diagnosis of juvenile rheumatoid arthritis (JRA) according to the ICD- 10. These patients were divided into three groups depending on the JRA variant. The first group included 33 children with systemic JRA. The average duration of the disease in them was  $5.70 \pm 3.85$  years, and the duration of headache was  $3.00 \pm 2.24$  years. The second group consisted

of 19 children with polyarticular variant of JRA. The duration of the disease in this group averaged  $5.21 \pm 3.20$  years, and the duration of headache was  $3.00 \pm 1.85$  years. The third group included 5 children with oligoarticular variant, the duration of the disease and headache in groups 3 and 4 was  $4.0 \pm 1.87$  and  $1.0 \pm 0.61$ , respectively. In the course of a comparative analysis by groups, a relationship was established between the duration of headache and the form of JRA. Thus, in children with the systemic variant of JRA, the duration of headache significantly exceeded that in patients with the oligoarticular variant of the disease ( $p < 0.05$ ).

The examination included the study of clinical and neurological examination, psychological tests, the use of instrumental methods: cervical radiography, examination of the fundus, MRI of the brain and spinal cord according to indications.

**Results and discussion:** 92 patients with JRA were examined, including 58 girls and 34 boys. The incidence of headache in the examined children was 51% in the systemic variant of juvenile arthritis, 29% in polyarthritis, 8% in oligoarthritis and 12%. Thus, the most common headache occurred in the systemic variant of juvenile arthritis, and least often in the oligoarticular variant ( $p < 0.05$ ). Analysis of the severity of JRA showed that patients with I and III degrees of activity of the inflammatory process suffered from headaches with approximately the same frequency - 23.1% and 26.2%, respectively. The most common headache-pain was noted in patients with II degree of activity (49.2%) ( $p < 0.05$ ). Number of children; headache sufferers; those with a JRA duration of both less and more than 4 years did not differ significantly (52.0% and 48.0%, respectively).



When considering the entire sample of patients with headaches, it was found that children with JRA most often had headaches of frontal localization (76.9%), moderate frequency (50.8%) and intensity (89.2%), lasting several hours. ; (66.2%); About half of the patients with headache complained of neck pain, pain on palpation of trigger points, and had limitation of motor activity in the cervical spine. According to X-ray and Dopplerography of the neck vessels, from 30 to 50% of them had various changes in the cervical spine and changes in the fundus. In the fundus, angiopathy of the retinal vessels was detected by the type of venous congestion in 90% of patients.

**Data of instrumental examination in patients with JRA suffering from headache.**

Age groups	Juvenile arthritis variants, (%)			Total
	Systemic	Polyarthritis	Oligoarthritis	
<b>Radiography</b>				
straightening of the cervical lordosis	48,5	<b>73,7</b>	0	
hyperlordosis	33,3 <sup>1</sup>	31,6	80	
dislocation of the vertebrae	<b>33,3<sup>1</sup></b>	<b>63,2<sup>1</sup></b>	0	

narrowing of the intervertebral fissure	<b>39,4<sup>1</sup></b>	<b>73,7<sup>1</sup></b>	0	
arthritis	15,2	26,3	0	
<b>Dopplerography of the vessels of the neck</b>				
Spasm of the vertebral artery	9,1	36,8	20,0	
Spasm of the spinal artery	6,0	31,6	20,0	
Dilatation of the vertebral artery	36,4	36,8	0	
Dilatation of the spinal artery	6,1	42,1	0	
Tortuosity of the vertebral artery	48,5	73,7	20,0	
Tortuosity of the spinal artery	12,1	31,6	0	
Asymmetry of blood flow in the vertebral artery	42,4	63,2	0	
Asymmetry of blood flow in the spinal artery	15,2	26,3	0	
Violation of the venous outflow	42,4	47,4	0	
<b>Ophthalmoscopy</b>				
Partial obscuration of the optic disc	23,7	26,3	0-	24,6
Plethora of veins	93,9	78,9	80,0	87,7
Vein dilatation	39,4	36,8	0	35,4
Tortuosity of the veins	33,3	47,4	20,0	32,3
Narrowing of the arteries	48,5	0	0	44,6
Spasm of the arteries	9,1	10,2	0	7,7

Based on the analysis of the anamnesis complaint, neurological examination data, laboratory and instrumental studies, we identified five types of headache (according to the ICGB) in children with various types of JRA:

- Tension headache (2);
- Headache associated with a noncommunicable inflammatory disease (7.3);
- Cervicogenic headache (11.2.1);
- Headache due to steroid hypertension;
- Headache associated with impaired homeostasis (10);

For groups of children with systemic and polyarticular variant of JRA, all four types of headache are characteristic, in the group with oligoarthritis, only tension headache and headache associated with a non-communicable inflammatory disease were found.

The most characteristic headache for the systemic variant of JRA was secondary headache associated with a violation of homeostasis,

Five types of headache occurring in children with JRA have been identified. These include tension headache, headache associated with a non-infectious inflammatory disease, craniocervicalgia, secondary headache due to steroid hypertension and homeostasis disorders. The most common of these were craniocervicalgia (54%) and HDN (50%). More than half of the patients had; a combination of several types of cephalgia.

When using MRI and/or CT methods, a change in the ventricular system was revealed in the form of its expansion or deformation and/or expansion of the subarachnoid space, as well as focal lesions of various brain structures, atrophy of the brain substance. Signs of external, internal or combined hydrocephalus were noted in all nosological forms. Focal changes in the brain substance included hyperdense zones with or without edema, single or multiple.

42 patients with JRA aged 13-16 years were tested, of which 13 (31%) children were diagnosed with the systemic variant of JRA, 16 (38%) with the polyarticular variant, 10 (24%) with the oligoarticular variant, and 3 ( 7%) - juvenile ankylosing spondylitis. The control group included healthy schoolchildren of the same age group (n=21). The average age of patients with JRA was 14.3±1.3 years, children from the control group - 13.1±3.1 years.

When studying the dependence of the psycho-emotional state of patients on the severity of the course of arthritis, the Spielberger-Hannin test scores and the level of subjective feeling of loneliness in subgroups of children with grades 1, 2, and 3 of JRA activity were analyzed and compared with the data of healthy schoolchildren.

The following regularities have been established:

- a low level of personal anxiety in patients with the 1st degree of disease activity and in the control group was detected with approximately the same frequency (30% and 38%, respectively).

- a low level of personal anxiety was significantly less frequently diagnosed in patients with grade 2 JRA activity compared to the control group ( $p < 0.05$ ) and did not occur in children with a high degree of disease activity.

- a moderate level of personal anxiety occurred with approximately the same frequency in all three subgroups (70%, 77% and 60%, respectively).

- a high level of personal anxiety was maximal in patients with the 3rd degree of disease activity (40%) ( $p < 0.05$ ) and was absent in children with minimal JRA activity.

- low level of situational anxiety is significantly higher in patients with the 1st degree of disease activity and in the control group ( $p < 0.05$ ).

- a moderate level of situational anxiety was determined with the highest frequency in children with the 3rd degree of JRA activity and significantly less frequently in patients with the 1st degree of disease activity and in the control group ( $p < 0.05$ ).

- a low level of subjective feeling of loneliness significantly prevails in the control group (86%), compared with children with the 3rd degree of activity (40%) ( $p < 0.05$ ).

- there is an inverse relationship in the form of a decrease in the frequency of detection of low and increase, moderate levels of subjective feelings of loneliness in JRA patients with an increase in the degree of disease activity.

**Analysis of the degree of subjective feeling of loneliness in patients with JRA**

Degree of anxiety	Activity 1	Activity 2	Activity 3	Control
Short	90%	64%	40%	86%
Moderate	10%	36%	60%	14%
High	0	0	0	0

**Conclusions.** Thus, headache is a significant manifestation in the clinical picture of JRA. It can be caused by various reasons, the identification of which is necessary, as this determines the further tactics of their treatment.

It can be concluded that the psycho-emotional state of patients with JRA, being a chronic progressive disease, causes the formation of personal and situational anxiety, regardless of the duration of the course of the disease. Possible additional factors in the development of psychological disorders in children with JRA are the use of GC therapy, as well as the presence of such stress factors as prolonged hospitalization, invasive manipulations and painful procedures.

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# SOCIO-PSYCHOLOGICAL PECULIARITIES OF A UNIVERSITY TEACHER

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<https://doi.org/10.5281/zenodo.8200344>

**Abstract.** *The article describes the problems of the activities of teachers at the university, the tendency to emotional burnout, the study of the main components of the syndrome of emotional burnout and its impact on the educational process. In the course of the practical part of the study, the features of anxiety and emotional burnout were studied using the example of two departments, socio-psychological features that affect the occurrence of emotional burnout among teachers were identified.*

**Keywords:** *socio-psychological characteristics, anxiety, anxiety level, burnout syndrome, teachers.*

## INTRODUCTION

The problem of the psychological well-being of a teacher is one of the most urgent problems in modern psychology of higher education. In modern conditions, the activity of a teacher is literally saturated with factors that cause professional burnout: a large number of social contacts during the working day, high responsibility, the need to comply with social norms. The professional activity of higher education teachers is distinguished by the fact that it occupies a dominant position in a person's life, often crowding out personal space and personal life. The effectiveness of professional activity is associated with the intensity of work, non-rationing of loads, emotional involvement, strict social limits and observance of moral categories.

## THEORETICAL BASIS OR METHODS

Teaching activity is currently one of the low-paid professions, while being an economically little prestigious profession. In addition, in the field of education, there is a clear trend of aging personnel, especially those with a doctorate degree.

These trends undoubtedly come down to the study of the syndrome of emotional burnout, which was studied by V.V. Boyko, V.E. Orel, A.D. Demina, N.Z. Kaigorodova and others. [12-17]

## RESULTS

When determining the syndrome of professional burnout of teachers at a university, it is important to determine the main components and their impact on the educational process:

**1. Emotional exhaustion.** Emotional involvement, brightness, charisma of a higher school teacher is a necessary arsenal of education, it not only helps students to better learn new material, activates their intellectual abilities, but also fills their lives with interesting events, promotes an active life position. With emotional exhaustion, the amount of learned material decreases sharply, interest is lost not only in the subject, but also in the learning process itself, both among students and teachers.

**2. Depersonalization** - a negative attitude towards a person, a negative, cynical or indifferent perception of him, develops as a defense against overwhelming emotional states as a result of treating a student as an object of professional influence. [12] Teachers with burnout

syndrome at the university are characterized by the prevalence of negative assessments and dissatisfaction with service relations.

An important component of personal attitude is anxiety. According to the author, it affects the syndrome of professional burnout and is directly related to cooperative behavior. [14] Anxiety is generated by a subjectively experienced threat. There is a frightening possibility of the following events: fear of losing self-respect, fear of “losing face” in a conflict situation or fear of “public ridicule” in a significant situation, fear of humiliation, as well as loss of love, approval, recognition from students and colleagues. This can develop into feelings of enmity towards others and towards the work in general. At the same time, the level of anxiety increases with the fear of simultaneously losing a job and reducing the load. [15]. Horney identifies four main means by which an individual tries to protect himself from basal anxiety: love, submission, power, and the reaction of withdrawal (removal) [13].

### **DISCUSSION**

In modern conditions, the requirements for the quality of work of university teachers are significantly increasing, but the established style of their pedagogical activity does not always fully meet the modern requirements of the educational process. Therefore, the study of the style of the teacher's activity continues to be an important psychological and pedagogical task, involving the diagnosis of style, the identification of factors, conditions, ways and means of its formation and improvement.

The style of pedagogical activity (SPA) is an individual-peculiar, relatively stable system of preferred methods and methods of pedagogical interaction between a teacher and students.

In terms of content, this system is significantly conditioned by motives, attitudes, values, and meanings of pedagogical activity. It is also determined by the peculiarities of the socialization and development of the teacher as a specialist, a professional, it characterizes his social mobility, his readiness to combine his abilities as a subject of the educational process with the capabilities of the object in a real situation of pedagogical activity as harmoniously as possible.

The style of pedagogical activity is determined by the properties of various hierarchical levels of individuality - from temperament to higher levels - the value-motivational sphere, the orientation of the teacher's personality.

Internal prerequisites determine the teacher's preferred choice of specific methods of didactic interaction. At the same time, style is a formative result of the social environment, it reflects the interaction in the social system "man - man". It can be said that the style of the teacher's activity is a system of conjugation of individuality with social structures and individual subjects.

The style of pedagogical activity should not be understood as the implementation of a set of individual properties of an individual: it is an integral system formed by expedient connections, with the help of which a certain result is achieved. A universal feature of the teacher's style of activity is its stylistic unity (integrity), which characterizes the functional unity of homogeneous mental properties focused on the implementation of specific functions of activity, as well as the manifestation of style as a characteristic of pedagogical interaction in general, including preference for a stimulus, type of situation, means and methods for achieving goals, the “form” of the result, etc.

The style of pedagogical activity as a multidimensional phenomenon has its own structure. It contains and manifests itself in various combinations and ratios of various components. The most significant of them give the style a unique, individual look.

Proceeding from the fact that “the structure of a person as a subject of activity is formed from certain properties of an individual and personality, corresponding to a certain subject and means of activity” [17], the style structure is an interweaving, interpenetration of content and operational components.

The meaningful substructure of style is a complex of characteristics related to different levels of individuality, and is a hierarchical system of basic integral parameters. It includes: temperament as a biological basis, a prerequisite for the development of stylistic components, expressive-instrumental and value-semantic spheres.

It should be noted that temperament, together with the properties of the substructure of experience, only affects the style, but determine its properties that are included in the upper level of the hierarchical structure of style.

The expressive-instrumental structure characterizes the forms and methods of external manifestation of individual properties, typical for the subject, interaction with the external environment. It includes character traits; features of intelligence and abilities; the originality of the role element of the structure of the style of pedagogical activity, given by a certain system of relations, expectations and norms of social groups.

In the real activity of the teacher, all the components and substructures of style, with all their diversity, difference and inconsistency, interacting and passing into each other, form an inseparable unity of style.

The content and operational structures of style correspond to such characteristics of activity as objectivity and subjectivity [12]. They reflect the bi-determination of the style itself - from the side of the subject and the objective conditions of activity.

The formation of the style of pedagogical activity is influenced by social and individual prerequisites, but they do not determine it, but only suggest certain possibilities. The need to use certain opportunities is determined by the development of activity, the specifics of the interaction of the subject with the external conditions of professional activity. They are the main reasons that determine the formation of individual style characteristics of the teacher's personality.

The assimilation of style is largely influenced by the zone of uncertainty of activity, which arises as a result of the possibility of achieving results using various methods, means and intermediate goals. At the same time, mastering the style is associated with the choice by the teacher of such a system of preferred tasks, methods for solving them and intermediate goals that contribute to achieving the greatest success in activity and the greatest correspondence of different-level individual properties to the requirements of the environment (the so-called “phenomenon of subjectively convenient conditions for activity”).

Moreover, “the assimilation of an individual style and the development of individuality occur due to a special, as we believe, universal motive - to always remain an individuality, protect one’s individuality and become an increasingly harmonious individuality” [13].

The formation and development of an effective style of pedagogical activity of a university teacher is an important task due to the fact that it ensures the professional development of a teacher and the achievement of a high level of pedagogical skill, minimizes the negative impact of the external environment on the personality and activities of a teacher, increases his psychological stability in the process of pedagogical activity, develops in him a holistic and adequate self-assessment of the personality and activity, the desire for creativity.

## **CONCLUSION**

Analysis of the obtained results mathematically reliably allowed us to assert that the level of anxiety in the humanities department is higher than in the technical one. Whereas the level of emotional burnout is higher in technical specialties. Specifying the psychodiagnostic results in the course of a psychological conversation, it was found that teachers of the humanities, having greater emotionality, have the skills of coinciding behavior. Teachers, suppressing emotions, quickly resolve conflict situations at the cost of professional burnout.

Thus, it is possible to single out socio-psychological features that influence the occurrence of burnout syndrome among university teachers:

– democratic transformations that led to the disruption of relationships between participants in the educational process;

– unpredictability of new changes in the field of education, both in the educational process and in the structure itself;

– the nature of professional teaching activity: the need for empathy, sympathy, moral responsibility for students;

- congestion of the working week; low wages; the intense nature of the work;

- official troubles; dissatisfaction with work: lack of a clear connection between the learning process and the result obtained, the discrepancy between the results and the effort expended;

- the presence of conflicts vertically and horizontally; the difficulty of solving difficult situations with students and university administration;

- inability to regulate their own emotional situations; dissatisfaction with their self-realization in various life and professional situations.

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## COMMON CHICORY-(*CICHORIUM INTYBUS L.*) USEFUL PROPERTIES AND USAGE OF MEDICINAL PLANT

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<https://doi.org/10.5281/zenodo.8200632>

**Abstract.** *Decrees of the President of Uzbekistan PD- No.3968 dated October 12, 2018 “On measures to regulate the field of folk medicine in the Republic of Uzbekistan”, PD-5707 dated April 10, 2019 “On measures to further develop the pharmaceutical industry of the republic in 2019-2021”. The beneficial properties of agrotechnics of medical plant Common chicory - (*Cichorium intybus L.*) for the protection of human health were studied.*

**Keywords:** *Common chicory, metabolite, inulin, bifidostimulant, fructose, intibin glycoside, carotene, groups of vitamins B (1, 2, 3), vitamin C, macro and microelements (Na, K, Ca, Mg, P, Fe), tannin, pectin, tar, metabolism, gastritis, dysbacteriosis, dyspepsia, atherosclerosis, tachycardia, hypertension, neurasthenia, depression.*

**Introduction.** Common chicory -(*Cichorium intybus L.*) A perennial herbaceous plant belonging to the Compositae family. The stem is branched, serbarg, 30-130 cm long, the lower part is white hairy. The leaves are arranged in a row. The flowers are pale, clustered in a short panicle in the axils of the leaves, and collected in a single basket-like inflorescence at the end of the stem. The root is an arrow root. penetrates the soil to a depth of 1.5 m. The root of common chicory contains up to 20% inulin. (It is grown as a medicinal plant in European countries). It begins to grow in March. Blooms and bears fruit from July to October. Grows from seed. Mainly found among irrigated crops. It also grows in abandoned lands, roads, fields, stream banks, and gardens. It is a pest-prone plant. In folk medicine, stem decoction and ash are used to treat sunstroke and rash.

It is widespread in European countries, including Tashkent, Jizzakh, Samarkand, Kashkadarya and Surkhandarya regions of Uzbekistan, and grows on stony and gravelly slopes of the lower and middle mountain regions. The stem is erect and covered with long hairs, the leaves are opposite. The flowers are blue, pink and white, located in inflorescences or in short baskets. Common chicory fruits have the appearance of a prismatic pistachio with a membranous papule.

Common chicory -(*Cichorium intybus L.*) 3-25 thousand seeds can be obtained from one bush of a medicinal plant. There are milk ducts in all organs of the plant. Common chicory blooms in summer and bears fruit from late summer to mid-autumn. Currently, common chicory is popular in many countries as a delicious spice and diet food product. Roasted chicory root has long been one of Europeans' favorite coffee drinks. The juice prepared from the root of common chicory by adding milk and cream is included in the diet of children and people who cannot drink coffee due to their health as a substitute for coffee. Belgians stew common chicory with cheese and apples, Latvians prepare a cool drink from common chicory root with honey, lemon and apple juice. The leaves and branches of the special salad plant are used as a component of various salads, the young branches of the plant are boiled or added to the dough and cooked.

**Collection of plants and its quality.** Common chicory root is harvested in autumn in September-October. To do this, they are first dug with a shovel, sometimes plowed with a plow. After that, the roots are separated by hand, washed and dried. Before drying, the root is cleaned

from the unnecessary part of the stem. If the roots are thick and long, they are cut lengthwise and crosswise into several pieces and dried in a dryer at a temperature of 50-60<sup>0</sup>C.

Dried plant will have a wrinkled appearance. It is slightly brown on the outside, white or yellowish on the inside. It is a plant with a bitter taste rather than a specific smell. The above-ground part is prepared like any medicinal herb: the upper part of the sprig is collected during flowering, divided into separate pieces and dried in shady places with good air circulation.

**Chemical composition.** Common chicory root contains up to 60% inulin, 10-20% fructose, intibin glycoside (used in the pharmaceutical industry), as well as carotene, groups of vitamins B (B1, B2, B3), vitamin C, macro- and microelements (Na, K, Ca, Mg, P, Fe, etc.), there are organic acids, tannins, pectin, protein substances, resins. Sachratki root contains valuable substance inulin, which improves metabolism and normalizes the activity of the digestive system.

#### **The use of common chicory in the treatment of various diseases.**

Common chicory -(Cichorium intybus L.) medicinal plant is considered a valuable medicinal plant popular in folk medicine for a long time. Common chicory root was used in ancient Rome to improve digestion, and in Egypt it was used to prepare anti-venom for snake and spider bites. Common chicory was used in the treatment of diseases of the gastrointestinal tract and eyes, inflammation of the eyes and gout. In modern medicine, common chicory has found a wide variety of uses due to its beneficial medicinal properties (sedative, hypoglycemic, astringent, expectorant, diuretic, anti-inflammatory, antipyretic, anthelmintic).

#### **Benefits of the plant for the digestive system.**

Root decoction has been one of the best means for improving appetite and normalizing the functioning of the pancreas. In addition, it helps dissolve gallstones, has a bile driving effect, improves blood flow in the liver and its metabolic processes. Inulin obtained from the plant is a bifidostimulant, promotes the development of beneficial intestinal microflora, and strengthens the body's general immunity. The substances contained in sakhratki help reduce the inflammatory process of the stomach and intestinal mucosa. Due to the above properties, it is widely used in the prevention and treatment of gastric and duodenal ulcers, gastritis, dysbacteriosis, dyspepsia, constipation, liver and gallbladder diseases (cirrhosis, hepatitis, etc.). It is very useful for nervous system and cardiovascular system.

The juice made from the root of the medicinal plant Cichorium intybus L. is useful for people with hypertension, neurasthenia, depression, insomnia, and migraine, as there are no cases where it cannot be used as a caffeine-free coffee substitute.

The juice has a calming effect on the human nervous system due to the fact that it is rich in vitamin B (these vitamins are responsible for good mood, healthy sleep, energy and strength). At the same time, potassium-rich juice (necessary for the normal functioning of the heart) helps remove excess cholesterol from the blood, dilate blood vessels, and normalize the amplitude and rhythm of heart contractions. It is for this reason that it is useful for people suffering from atherosclerosis, tachycardia, diseases of the cardiovascular system, and other diseases to consume soft drink in their diet. The high amount of iron contained in Common chicory is used in the prevention and complex treatment of anemia.

**Against diabetes and obesity.** In medicine, it is considered valuable because it contains high molecular polysaccharide inulin in its root. It is inulin that helps to reduce the amount of sugar in the blood, improve metabolism and digestion, all these properties play a positive role in the prevention and treatment of diabetes and are effective in the fight against excess weight. It is

also used in complex treatment of skin diseases. Due to its bactericidal and anti-inflammatory effect, it can be used as a wound healing agent (infusion, decoction and alcohol tincture of the plant for seborrhea, allergic dermatitis, neurodermatitis, diathesis, eczema, chicken pox, psoriasis, pes, acne, furuncle, etc.). The use of thistle in everyday life has a significant positive effect in the treatment of spleen diseases, inflammatory diseases of the kidneys and kidney stones. In addition, regular consumption of the contents of the mushroom helps to cleanse people of toxins, radioactive substances and heavy metals.

**Preparation of detox from common chicory root.** Add 200 ml of boiling water to 1 spoonful of ground common chicory root, heat it after boiling for 10 minutes on low heat, then strain it. Drink 50 ml 3 times a day for diabetes. common chicory root decoction is used as an expectorant in diseases of the pancreas, gall bladder, liver (also in gallstone disease), as a diuretic in kidney diseases, improving digestion and treating metabolic diseases. Externally, it is used as baths, soaks and compresses for skin diseases and gout.

**Common chicory root tincture.** Pour 200 ml of boiling water over 2 teaspoons of crushed root, let it rest for 1-2 hours, cool and filter. The infusion is consumed 3-4 times a day. It is used in the treatment of diabetes.

**Circumstances that cannot be used.**

Patients suffering from vascular diseases, as well as varicose veins or hemorrhoids, should consult a doctor before consuming common chicory products in their daily diet.

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## THE BENEFITS OF THE MOST IMPORTANT MEDICINAL PLANTS FOR HUMANS IN STRENGTHENING THEIR IMMUNE SYSTEM

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<https://doi.org/10.5281/zenodo.8200641>

**Abstract.** *On the basis of decrees of the President of Uzbekistan PD- No.3968 dated October 12, 2018 “On measures to regulate the field of folk medicine in the Republic of Uzbekistan”, PD-5707 dated April 10, 2019 “On measures to further develop the pharmaceutical industry of the republic in 2019-2021” - in strengthening the immune system, a special and group type of immunity is found in plants. In specific immunity, plants show resistance to a biotype or race belonging to a species of pathogens, and in group immunity, resistance to several races or species of them.*

**Keywords:** *enzymes, antioxidants, plant hormones, salicylic acid and salt, polysaccharides, amino acids, glycosides, vitamins V: 1,2, 6,12, A, C, E, PP vitamins, saponins, alkaloids, casting, eczema, psoriasis, UF- radiation.*

**Introduction.** The manifestation of immunity often depends on the enzyme system of the host-plant, the effect of phytoncides, phytoalexins, the stability of oxidation energy exchange, the amount of some chemical compounds, as well as the specific morphological structure of the plant. The mechanism of protection of plants against pathogens is their hypersensitive reaction. The basis of this feature in plants is that infected cells die quickly and pathogens cannot spread in them. There is no single theory about the diversity of pathogens and plant defense mechanisms. The ability of plants to produce antibodies against antigens has not been proven either.

Special and group types of immunity are found in plants. In Specific Immunity, plants show tolerance to a biotype or race of pathogens, and in herd immunity, they show resistance to several races or types of pathogens. Medicinal plants such as aloe, astragalus, echinacea, black elderberry, ginseng, licorice, gazanda, and St. John's wort are important for strengthening the immune system.

1. Aloe medicinal plant is one of the oldest medicinal plants.





Medicinal properties of aloe medicinal plant are determined by the content of many substances that activate the recovery processes in the human body. As a result of the scientists' research, they found that it contains enzymes, antioxidants, plant hormones, salicylic acid and salt, polysaccharides, amino acids, glycosides, and vitamins B: 1,2, 6,12. In addition, there are vitamins A, C, E, PP and essential oils. It can be grown and stored at home or purchased from specialty stores. Aloe plant has a certificate of the International Scientific Council, Ibn Sina carried out many experiments. Aloe juice contains more than 200 active components, including micro- and macroelements, vitamins, enzymes and amino acids, which are important for improving the human immune system. Aloe juice is obtained from the home-grown type of the plant.

Aloe juice has the property of quick healing of the affected area and is also an anti-microbial agent. Also, aloe effectively helps in the treatment of conjunctivitis and other inflammations. Aloe juice and ointment treat acute and chronic diseases of the skin. Eliminates wounds, injuries and burns and restores the skin to its original state.

2. **Astragalus** medicinal plant strengthens the immune system in humans.



Astragalus (Astragalus) is a member of the leguminous family and consists of grasses, shrubs, and sometimes shrubs. There are 1600 types. 592 species grow in Central Asia and 250 in Uzbekistan. This plant is harvested mainly for its root because it has many medicinal properties. Astragalus medicinal plant is used by making tea from its flowers and leaves and adding it to liquid food. You can also buy this herb in capsule, extract and powder form. Astragalus strengthens the immune system and helps fight flu. It is used in the treatment of ischemic heart diseases, alleviating allergic diseases, increasing the energy level, strengthening the nervous system, and the immune system.

3. Echinacea is used to treat colds, flu and other infectious diseases.



This plant has long been used to treat colds at home. If you gargle with it in angina, an effective result is achieved. According to some reports, echinacea has also been used in the treatment of respiratory tracts. This herb has also been used in the treatment of skin diseases such as wounds, casts, eczema, psoriasis, UV radiation, herpes simplex virus, and bee stings. The homeland of this magical flower is North America. From ancient times, the Indians knew how healing echinacea is, and applied compresses from its roots to wounds, insect and snake bites. They boiled this herb, washed their eyes, cleaned burned areas, and used the tincture for toothache and gum inflammation. Since its composition is rich in substances such as essential oils, glycosides, saponins, polysaccharides, and alkaloids, echinacea can't stop much in raising immunity. It has a bacteriostatic, anti-inflammatory, soothing effect: it helps with colds, flu, ear infections, bladder diseases.

Normalizes the activity of the nervous system: helps with depression, mental and physical stress. Increases the ability of cells to resist the attack of pathogenic microorganisms.

4. Medical plant Sambucus



**Sambucus** -various tinctures are made from the fruit. To improve the immune system of young children, to treat cough, to treat diabetes, to prevent cancer, it is rich in vitamins, it is widely



used in the food industry, especially in the preparation of kvass, in the preparation of molasses, and in folk medicine. This medicinal plant is used in the preparation of decoction, tincture, and tea. It contains ascorbic acid, caratinoids, essential oils, aldehydes, various alkaloids, i.e. sambunigrin. Sambucus plus is used for colds, ear diseases, bronchitis, tracheitis, flu, kidney and bladder diseases, diarrhea, various oncological diseases, neuralgia, mastopathy, rheumatism, gout, arthritis, hemorrhoids, burns.

#### 4. Ginseng medicinal plant.



**Ginseng (*Panax ginseng*)** — A perennial herb belonging to the Araliceae family. An ancient plant that grows naturally in East Asia, China and Korea. It has been known as a medicinal plant since ancient times (medicines taken from its roots increase the body's strength). It is grown in a botanical garden in Uzbekistan. A number of useful chemicals contained in the composition have been widely used in folk medicine for the treatment of various diseases since ancient times. The root of the plant contains alkaloids, various juices, vitamin C, sulfur and phosphorus, aromatic substances, as well as micro- and macroelements. The plant has a calming and pain-relieving effect on the human body. Ginseng increases the ability to work in a person, improves gas exchange in the lungs. As a result of the healing effect of ginseng, a person's arterial blood pressure is normalized, the work of the endocrine system increases, and the amount of sugar in the blood decreases. Ginseng has a calming effect on nervousness, tension and anxiety. The plant is consumed during mental and physical stress.

Ginseng improves blood formation and memory, normalizes metabolism and cardiovascular system. Ginseng prevents premature aging of the body and does not have any other negative effects on the body.

This plant strengthens the immune system, helps to dissolve excess fat in the body. In folk medicine, ginseng is consumed as tincture, decoction, ointment, tea, and when dry. Regular

consumption of the tincture helps in the treatment of diabetes, tropical wounds, neuropsychiatric diseases, as well as relief from constant fatigue, nervousness, tension and anxiety.

**6. Licorice medical plant.**



**Licorice (*Glerrhizza glabra*)** a perennial plant belonging to the family of sedges. It grows mainly on mountain slopes, groves, riverbanks, stream banks, salty and sandy lands, sometimes among crops. Licorice is naturally distributed mainly in Central Asia. It grows in many parts of our country. It also grows naturally in the orchards around the shrine of "Termiz ota" and in the fields of the Tashdau farm experimental area. It contains useful medicinal substances that treat various diseases.

In particular, there is a large amount of Licorice substance with a sweet taste, essential oils, 27 types of flavonoids, glucose, sugar, starch, ascorbic acid, protein and other useful substances.

Licorice has been found to normalize the amount of water and salt in the body, protect against colds, treat various allergic and skin diseases such as itching, scabies, and urticaria (the process of swelling of the whole body when eating strong fatty food). Juices made from the root have an expectorant, pain-relieving and soothing effect on inflammation of the respiratory tract.

In medicine, decoctions made from the root are used as a diaphoretic, mild expectorant, and in the treatment of shortness of breath, cough, stomach and duodenal ulcers. That's probably why many people consume the tincture of the root of the plant. Licorice has medicinal properties such as refreshing, rejuvenating and normalizing eyesight. After 20-30 minutes after eating nutritious and high-quality food, after drinking the tincture 2 or 3 times a day for a month, its beneficial properties will be manifested. In this regard, in my observations. Licorice grows naturally in many places of Tashkent region, Kibray district.



## 7. Nettle-medical plant



**Nettle** medicinal plant used in folk medicine since ancient times. It grows in the mountainous areas of almost all regions of Uzbekistan, on dry land near water, on roadsides, near populated areas, in bushes, around houses. Gazand is perennial, its leaves are picked by hand. The harvested leaves are dried in the shade. The plant contains carotene, vitamins C, K, B2, panthothenic and formic acids, urticin glycoside, histamine, chlorophyll, starch, flavoring and other substances. Abu Ali ibn Sina used the fruit of the ghazanda plant to treat shortness of breath, and the leaf as an anti-hemorrhagic medicine. In folk medicine, tincture or decoction and powder made from plant leaves are used in the treatment of chest pain, stomach, fever, shortness of breath, hemorrhoids, as well as expectorant, diuretic, and hemostatic drug.

In scientific medicine, medicinal preparations of the gazanda plant, tincture, liquid extract are used as a medicine to stop bleeding from the lungs, kidneys, intestines, cystitis, menstrual disorders, uterine bleeding) and to treat chronic wounds, diseases caused by a lack of vitamins (avitaminosis). The leaves of the gazanda plant are included in tea preparations used for stomach ailments and as a blood-stopping medicine.

## 8. St. John's wort-medical plant



**St. John's wort** (Hypericaceae) a wild perennial herb - collected and dried herb of *Hypericum L.* during flowering. It contains flavonoids, essential oil, vitamins, resins, sugars, dyes

and additives. Abu Ali ibn Sina used the field plant as a pain reliever, diuretic and to treat various wounds. In folk medicine, a tincture prepared from field species is used in the treatment of kidney, bladder, stomach-intestinal (diarrhea) diseases. In addition to these, herbal tincture is used as a hemostatic drug (for bleeding from internal organs or spitting up blood). A fresh leaf is chopped, crushed and applied to the wound. To prepare a tincture from the field species, pour a glass of boiling water into a container with a closed mouth, add 10 grams of the ground upper part of the plant and infuse it. Then it is washed in gauze. The infusion is drunk 2-4 times a day after meals in a tablespoon.

In scientific medicine, medicinal preparations of the field plant (tincture, detox, liquid extract) are used in the treatment of diseases of the stomach and intestines (colitis, diarrhea), oral cavity (gingivitis, stomatitis) and burns of the II and III degrees. It is recommended to use tincture and tincture made from the above-ground part of the plant as a diuretic and anthelmintic medicine.

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## DETERMINATION OF MACRO AND MICRO ELEMENTS IN -0-k-ZIZIPHORA PLANT

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<https://doi.org/10.5281/zenodo.8200658>

**Abstract.** This article provides information on the determination of macro and micro elements found in the composition of the ziziphora plant.

**Keywords:** Ziziphora, medicinal properties, macro and micro elements, ICP-MS – (inductively coupled plasma mass spectrometr).

**Introduction.** Ziziphora is a perennial herb about 40 cm tall, belonging to the family of sedums. It blooms in June-July, bears fruits in July-August, grows on the slopes of the mountain district, on gravel and stony brown soil at an altitude of up to 2400 meters above sea level.

Mainly the above-ground part of the plant (grass) is used. It is better than black pepper and laurel in its healing and pleasant taste. [1]

This plant has been used in folk medicine since ancient times. It is found almost everywhere in the world. There are 7 types of it in our country, and it grows in the mountainous regions of Tashkent, Samarkand, Jizzakh, Namangan, Kashkadarya and Surkhandarya regions.

Ziziphora tincture is used as an expectorant, anti-cold, analgesic, hypnotic, anthelmintic.

One of the reasons for its widespread use now is its importance in the natural treatment of high blood pressure, which affects almost 60% of the population. Bod is an effective tool in the treatment of rheumatism, and in the elimination of the highly contagious flu viruses that flare up in the spring and autumn months. [2]

In addition to the above, deer grass is used in folk medicine for nervousness, bee and bee stings, women's climax, lice and lice irritation, headache, bronchial inflammation, weakness, liver inflammation, colic, lung inflammation, constipation, alcoholism, loss of appetite, cough, cataract, inflammation of the eye, blurred vision, whooping cough, nausea, stomach disease (gastritis), blood circulation disorder in the brain, client's sluggishness (impotence), inflammation of the tonsils (tonsillitis), nerve pain, inflammation of the nerves (neuritis), weight loss, indigestion, lack of vitamin D in the body, spinal cord disease, gout, halitosis, restlessness, pleurisy, obesity, urinary retention, diuretics, hair loss, bone pain, angina, fungal skin diseases, itching, teeth Diseases, flu, seizures, insomnia pain, paralysis, hernia, cold, urticaria, pulmonary emphysema, inflammation of the middle ear, determination of macro and micro elements in the content of sugar diabetes mellitus is a medicine that is used in the natural treatment of diseases such as gallstones, delayed menstruation, inflammation of the mucous membrane of the larynx is one of the medicinal plants. [1,3]

The aim of our research is to determine the trace and microelements in deer grass by the ICP-MS – (inductively coupled plasma mass spectrometr) method.

**Research method.** Quantitative composition of micro and macroelements was studied by ICP-MS (inductively coupled plasma mass spectrometer) method of analysis at 7500 using "Test.M" in "Semiquant" mode[4; p. 489].

**Analysis and results.** For the study of the object, samples weighing 0.1 g were taken in heat-resistant envelopes for separation, 10 ml of concentrated nitric acid (HNO<sub>3</sub>) and 2 mL of perchloric acid (HClO<sub>4</sub>) was poured. This was done by boiling the solutions on the plate until the sample was completely decomposed and a completely clear solution was obtained. The obtained solutions were then quantitatively transferred to 100 mL flasks with purified water. The samples prepared in this way were used for ICP-MS (inductively coupled plasma mass spectrometer) mass spectral analysis. Device parameters: ICP-MS 7500 plasma power 1200 W, integration time 0.1 sec. calibration and quantification of the device was carried out on the basis of the multi-element calibration standard of the company "Agilent Technologist", 44 elements. As a result of the analysis, 27 macro and micronutrients were identified in the Ziziphora plant leaf and are listed in Table 1.

Table 1

<b>Macroelements</b>		Titan (Ti)	27
Potassium (K)	15711	Vanadium (V)	1,70
Calcium (Ca)	14453	Chrome (Cr)	2,82
Magnesium (Mg)	1538	Manganese (Mn)	58,3
Sodium (Na)	458	Iron (Fe)	919
Phosphorus (P)	1157	Cobalt (Co)	0,434
<b>Microelements and ultra microelements</b>		Nickel (Ni)	2.46
Lithium (Li)	3,35	Copper (Cu)	5,61
Beryllium (Be)	0,108	Zinc (Zn)	19,07
Bohr (B)	60,00	Gallic (Ga)	0,867
Aluminum (Al)	1056	Strontium (Sr)	24,8
Iodine (I)	0,377	Zirconium (Zr)	0,321
Arsenic (As)	0.759	Niobium (Nb)	0.051
Rubidium (Rb)	6,96	Molybdenum (Mo)	1,04

Based on the information presented in the table, it can be seen that macro, micro and ultramicroelements are found in *ziziphora*, they can be placed in the following rows in descending order:

*Macroelements* – K > Ca > Mg > P > Na;

*Microelements and ultra microelements* – Al > Fe > B > Mn > Ti > Sr > Zn > Rb > Cu > Li > Cr > Ni > V > Mo > Ga > As > Co > I > Sr > Be > Nb > Ge.

Based on the above, the content of potassium, calcium and magnesium is the highest among macronutrients, and among micronutrients – Al, Fe, B, Mn, Ti, Zn is dominant in terms of quantity. This will further increase the focus on *Ziziphora*. The creation of food supplements made using *Ziziphora* plant also serves to strengthen human health and prolong life.

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**International Scientific Journal**  
**Science and Innovation Series D**  
**Volume 2 Issue 7**

**ISSN: 2181-3337**

Published: 31.07.2023. Font: "Times New Roman".

LLC "Science and innovation"  
License Mass Media №:1597 27.04.2022  
License Publisher №:038864 15.09.2022  
Address: 100155, Uzbekistan, Tashkent city, Sergeli district, Quruvchi, 22/43.  
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