

MINISTRY OF HEALTH OF UKRAINE
Vinnytsia National Pirogov memorial Medical University

"Approved"

by Methodical Council
Department of Tuberculosis, Clinical Immunology
and Allergy
Chair of Department
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Guidelines

**for independent preparation for practical classes for 5th year
medical students**

Topic № 3

<i>Academic discipline</i>	"Clinical immunology and allergology"
<i>Module №1</i>	"Clinical immunology and allergology"
<i>Content module № 1</i>	Immune status, age features. Immunodeficiency and other immunodependent diseases principles of diagnosis, immunotherapy, immunoprophylaxis and immunorehabilitation.
<i>Topic of the lesson</i>	Basic principles of immunotropic therapy. Immunorehabilitation, immunoprophylaxis.
<i>Course</i>	5th
<i>Faculty</i>	"Medical business", "Pediatrics", "Medical and preventive business"
<i>Number of hours</i>	2

I . Relevance of the topic : Different types of immunopathology: immunodeficiencies, allergic and autoimmune, lymphoproliferative (tumor) diseases that occur against the background of chronic recurrent infectious-inflammatory processes occur as a result of transient or persistent immunomodulation under the influence of negative environmental factors. Thanks to the success of theoretical and clinical immunology, the mechanisms of etiology and pathogenesis of these diseases, which are accompanied by disorders of various parts of the immune system, have been revealed. This makes it possible to influence the course of immune reactions with the help of immunomodulatory and immunosuppressive therapy, the implementation of which in practice is considered one of the greatest achievements in medicine.

II. Learning objectives of the lesson.

1. Get acquainted with the main types, methods and principles of immunotherapy (immunocorrection).
2. Know the meaning of such concepts as immunostimulation, immunosuppression, immunomodulation, immunorehabilitation, immunoprophylaxis.
3. Master such concepts as immunotropic drugs, immunosuppressants, immunomodulators, immunostimulants.
4. Know the classification of immunotropic drugs, indications and contraindications to their appointment in accordance with immunopathology and immunological laboratory changes, side effects, clinical criteria.
5. To know the basic principles of treatment of immunopathology and to be able to determine the priorities of treatment of an individual patient taking into account the concomitant pathology.
6. Be able to conduct a clinical examination of a patient with a specific immunopathology on the basis of the acquired knowledge and skills, appoint the necessary examination, be able to interpret their data, make a differential diagnosis within related nosologies and choose treatment tactics.
7. Independently study and prepare a speech of up to 5 minutes on the need for immunotherapy in patients with a future profile of the specialty (neurology, pulmonology, obstetrics, rheumatology, pulmonology, gastroenterology, cardiology, etc.). If possible, demonstrate to a supervised patient.

III. Individual development goals (educational goals)

To acquaint the student with the concept, types, methods and principles of immunotherapy, immunoprophylaxis, immunorehabilitation and to develop a sense of responsibility for the timeliness and correctness of professional actions when choosing treatment for each patient. Based on deontological principles to teach a young specialist to establish psychological contact with the patient / patient and his relatives.

IV . Interdisciplinary integration

p / p	Discipline	Know	Be able
1	Biology	Evolution of the immune system of living organisms	
2	Normal anatomy	Organs of the immune system, their structure	be able to examine

3	Histology and embryology	Cells of the immune system, their structure	be able to detect by optical microscopy
4	Normal physiology	The functions of the immune system are normal	detect during testing
5	Endocrinology	Thyroiditis, Addison's disease: clinical and laboratory manifestations	be able to diagnose, treat
6	Genetics	Principles of inheritance of diseases, chromosome structure	be able to prescribe methods of genetic testing
7	Pathological physiology	Immunopathological reactivity, changes in the proteinogram, leukogram	interpret blood tests, proteinogram, immunogram
8	Hematology	Autoimmune hemolytic anemia, thrombocytopenia, agranulocytosis: clinical and laboratory signs	be able to diagnose, treat
7	Pulmonology	Exogenous allergic alveolitis, sarcoidosis, fibrosing alveolitis: clinic, diagnosis, treatment	be able to diagnose, prescribe treatment
8	Propaedeutic therapy	Examinations of the immune system are clinical and instrumental	to conduct a clinical examination
9	Rheumatology	Criteria for RA, SLE, SCD, rheumatism	to conduct a clinical examination of patients
10	Neurology	Criteria for multiple sclerosis, myasthenia gravis	to conduct a clinical examination, to treat
11	Obstetrics	Problems of infertility with immune mechanisms	to conduct a clinical examination, to treat
12	Pharmacology	The main groups of immunosuppressants, immunomodulators. Rules for writing prescriptions	prescribe prescriptions, prescribe adequate treatment

V. Content of the lesson topic .

The teacher reminds students of the importance of a carefully collected anamnesis and emphasizes that the basis for the appointment of immunotherapy is the clinical signs of immunopathology. Also defines the concepts of immunotherapy, immunoprophylaxis, immunorehabilitation, immunocorrector (immunomodulator); tells about the indications, contraindications and principles of immunotherapy.

Immunocorrection ("immunotherapy", "immunomodulation") is a type of treatment that acts on the body's immune system to restore immune homeostasis, regulation or temporary replacement of certain parts of the immune system.

Indications for immunotherapy should be clearly justified in each case, taking into account the level of necessity and time of its implementation. Immunotropic drugs should be prescribed taking into account clinical and immunological parameters, under the control of the influence of drugs in each case.

Immunotherapy is performed for the following contingents:

the first group - persons with clinical signs of impaired immunity and changes in laboratory immunological parameters;

the second group - persons with clinical signs of immune system disorders in the absence of changes in laboratory immunological parameters.

It is **not performed in** people who have only changes in immunological parameters without clinical signs of immune deficiency.

Immunotherapy can be extra- and intraimmune.

1. Extrimmune therapy includes:

- reduction of antigenic load on the body (hypoallergenic diet, etc.);
- elimination of chronic foci of infection (antibiotics, surgery);
- appointment of a set of non-specific drugs aimed at improving the general condition of the body and metabolism.

2. Intraimmune therapy - the use of immunotropic drugs, incorporeal and extracorporeal methods of treatment.

Intraimmune therapy, as a means for the immune system, depending on the effect is divided into: immunostimulatory, immunosuppressive, immunomodulatory. And also in recent years a new direction in clinical immunology - immunorehabilitation is actively developing.

Immunostimulation is a way of activating a certain clone of immunocompetent cells or general strengthening of immune protection.

Immunosuppression is an action on the immune system aimed at suppressing or eliminating antibodies and / or lymphocytes that specifically respond to allo- or autoantigens.

Immunomodulation is a system of measures to return the immune status to a normal balanced state.

Immunorehabilitation is a set of medical and health-improving measures aimed at restoring disorders of the immune system.

The student needs to know that there are the following **methods of immunocorrection**:

- medicinal (immunotropic drugs);
- non-drug (phyto-, api-, physio-, reflexo-, aromatherapy);
- incorporal (tonsil-appendix, splenectomy);
- extracorporeal (immuno-, lieno-, hemosorption, plasmaphoresis).

Basic principles of immunotropic therapy

- Making a reliable clinical diagnosis and determining the degree of immune pathology, which are based on the identified clinical signs of immune deficiency, the data of laboratory immunological examinations with due regard to concomitant somatic pathology.

- Individual selection of immunomodulatory drugs depending on the degree of immune disorders.

- Immunotherapy with immunomodulatory drugs, as a rule, is carried out against the background of pathogenetic therapy and is part of a comprehensive treatment program for the patient.

- Comprehensive immunorehabilitation using immunomodulators should consist of methods that directly affect the immune system and methods of extraimmune action.

It should be noted that in addition to drugs that are classified as immunotropic, many drugs administered for other purposes may also affect the immune system (hemodesis, riboxin, methyluracil, dibazole, curantil, indomethacin). A number of folk remedies, non-drug factors such as physical, psycho-emotional stress, physiotherapy, temperature and climatic conditions can have an immunotropic effect. In recent years, such non-drug methods as: magnetic therapy, electromagnetic therapy (millimeter or decimeter waves), UV or laser irradiation of blood are widely used.

The immune system has many relationships with other life support systems, and above all, with the central nervous and endocrine. The central organ of the immune system, the thymus, is known to be part of the hypothalamus - pituitary - adrenal cortex - gonads. Therefore, a certain effect on the immune system can also be achieved by affecting the central nervous and endocrine systems. The immune system is characterized by a clear, balanced operation of systems and antisystems, a sequence of stages of response, so when planning treatment with immunotropic drugs it is necessary to clearly determine the clinical and immunological stage of the immune response and the degree of damage to the immune mechanism.

Immunocorrective therapy can be mono- or combination immunotherapy. **Monoimmunokor is huyucha** therapy is used in patients with isolated

immunodeficiency II-nd degree in one of the systems immunity based efficacy in each individual case and disease and the patient. **Combination** immunotherapy means the simultaneous use of several immunomodulators that have different mechanisms of action. This therapy should be performed by a highly qualified specialist - a clinical immunologist under the control of a number of laboratory parameters.

Immunotropic drugs - are drugs that are mainly affected in one way or another functional system of immune homeostasis and characterized tropism for the immune system.

Immunomodulators are drugs that restore the therapeutic function of the immune system in therapeutic doses (effective immune protection). The effect depends on the initial condition of the patient: reduce the increase and increase the reduced immunity.

And immunostimulants are drugs that strengthen the immune system, bringing reduced levels to normal.

And immunosuppressants are drugs that suppress the immune response.

Immunotropic drugs are prescribed :

1. In immunodeficiency diseases, weak and chronic inflammatory processes, frequent relapses, concomitant complications.
2. Against the background of a complete diet, taking vitamin preparations which include micro- and macronutrients.
3. After preliminary use of detoxification therapy to increase the function of elimination organs (enzymes, sorbents, infusion therapy).
4. After the correct choice of the drug depending on the degree of dysfunction of a particular part of the immune system, the stage of the process.
5. After preliminary determination of individual sensitivity to drugs, selection of in vitro dose, individual scheme.
8. Children and the elderly are gradually increased and decreased doses of immunotropic drugs.
9. During the period of convalescence, drugs are used to help rehabilitate the immune system (vitamins, adaptogens).

P idbir Immunotropic drug in vitro :

- 1). Without selection (on the recommendation of the company in the instructions)
- 2). By the level of expression of antigens (CD2, CD3 in vitro)
- 3). According to the phenotype of T- and B-lymphocytes in experimental therapy (each drug for 3-4 days, test before and after appointment)
- 4). By NK in vitro activity (oncology)
- 5). By modulating the phagocytic activity of leukocytes
- 6). Optimal: definition of Tl. + NK + FAL

There are several classifications of immunotropic drugs \. In our opinion, the most successful classification is "by origin".

Immunotropic drugs (classification)

I. *Products of physiological (biological) origin*: tactivin, thymostimulin, thymalin, thym-vocal, thymomodulin, thimactide, thymotine, vilozen, myelopid, laferon, reaferon, intron-A, imukin, leukinferon, leukomabule, granocino, granocyte.

II. *Products of microbial origin* :

Live bacteria - BCG;

Extracts - Biostim, urovax;

Lysates - bronchomunal, IRS-19, imudon, bronchovax, rinovac, respivax, urostim;

Lipopolysaccharides - pyrogenal, prodigiosan;

Yeast polysaccharides - zymosan, nucleinate;

Fungal polysaccharides - bestatin, lentinan, glucan;

Ribosomes + proteoclglian - ribomunil;

Probiotics - blasten, biosporin, linex;

III. *Synthetic drugs*: thymogen, lycopene, diucefon, levamisole (decaris), kemantan, leacadine, polyoxidonium, groprinosin, isoprinosine, neovir, cycloferon, galavit.

IV. *Vitamins and antyoksy dantni drugs* : olihovit, yunikap more.

V. *Herbal preparations* : Imunal, Manax, tinctures of Echinacea, Lemongrass, Ginseng, Eleutherococcus, Immunoflam, Phytomax, Immunomax.

VI. *Enterosorbents* : white sorb, ensoral, mycoton, cilart, anthralen.

VII. *Immunosuppressants*: glucocorticoids, azathioprine (imuran), sandimun, prograf, selsept, thymoglobulin.

VIII. *Complex enzyme preparations* : wobenzyme, phlogenzyme, vobemugos.

IX. *Inducers of endogenous interferon* : dibazole, indomethacin, amizon, phytomax, proteflazid, lavalax.

The teacher presents the mechanisms of action of certain groups of drugs.

AND MUNORREGULATORY PEPTIDES OF THYMAL ORIGIN (T-activin, thymostimulin, thymalin, tim-vocal, timoptin, vilozen, etc.)

Mechanisms of action:

- increase lymphopoiesis;
- induce maturation, differentiation, increase the functional activity of T cells;
- enhance the response of T cells to mitogens;
- generate T cells with suppressor and killer functions;
- increase the production of various cytokines (T-activin, thymostimulin);
- induce the production of thymic serum factor (T-activin), increase the phagocytic activity of neutrophils (thymoptin);
- inhibit the production of immunoglobulin E, and stimulate the production of immunoglobulins M, G
- membrane stabilizing effect on basophils (villous).

MI UNOREHULYATORNI Peptides KISTKOVO- CEREBRAL ORIGIN (miyelopid - activin B).

Mechanisms of action:

- accelerate the rate of maturation of B-lymphocytes;
- increase the number of cells that produce antibodies (especially antiviral);
- increase the overall resistance of the organism;
- have the ability to reduce pain by acting on the processes of sensory signals in the nervous system;
- regulate the increased activity of T-killers, K-cells, NK-cells.
- increase the function of T-helpers;
- stimulate the B-system of immunity at the level of the secondary immune response;
- act on the red hematopoietic sprout (thus can be used for anemia).

SLEEVE PREPARATIONS (leukomax, granocin).

Mechanisms of action:

- enhance the expression of HLA class 1 on human monocytes;
- increase the synthesis of antibodies;
- increase the phagocytic activity of mature leukocytes in the peripheral blood.

CYTOMEDINS - low molecular weight peptides that perform the functions of tissue-specific intracellular and intercellular messengers (prostate flax, epithalamine).

Mechanisms of action:

- restoration of the functions of those organs from which they were received changed as a result of a disease or aging.

PRODUCTS OF MICROBIAL ORIGIN (see above):

Mechanisms of action:

- increase the number of macrophages and their phagocytic activity;
- increase the content of endogenous lysozyme and interferon;
- activate the processes of peroxidation in macrophages-monocytes, which contributes to the destruction of infectious agents
- stimulate the secretion of prostaglandin E2, interleukin-1, TNF (tumor necrosis factor), macrophage-monocyte cells;
- stimulate the release of cytokines (IL-6, IL-8, interferon);
- enhance the expression of adhesion molecules on macrophages, monocytes and granulocytes;
- increase the amount of secretory immunoglobulin A, serum Ig-A, Ig-G, Ig-M.

SYNTHETIC PREPARATIONS (see above).

Mechanisms of action:

- activate the proliferation of T-lymphocytes;
- enhance the reactions of phagocytosis, normalize the functions of cellular and humoral immunity;
- enhance the blast transformation of lymphocytes;
- increase the production of antibodies by stimulating macrophages and T-helpers;
- activate NK cells, the complement system;
- stimulate interferon production;
- reduce the intensity of the delayed type hypersensitivity reaction.

IMMUNOSUPPRESSORS (glucocorticosteroids, azathioprine (imuran), sandimmun, prograf, selsept, thymoglobulin, thymoglobulin, etc.).

Mechanisms of action:

- immunomodulatory action (ACS);
- inhibit the activity of T-cell mechanisms (T-cytotoxic-killers-CD8 +);
- suppress humoral protective factors (reduce antibody production);
- inhibit the production of pro-inflammatory cytokines IL-1, IL-2, IL-3, TNF;
- inhibit cellular factors of inflammation and collagen biosynthesis.

VITAMINS AND VITAMINS (see above):

Mechanisms of action:

- Vitamin C - stimulates phagocytosis and lymphocyte migration. Contained in viburnum, rowan, currant, dog rose.
- Vitamin A - stimulates the complement system, properdin, enhances antibody genesis, is an immunoprotector. Contained in carrots, spinach, lettuce, parsley, green onions, red peppers, rose hips.
- Vitamin E - enhances antibody production, the activity of T-helpers. Contained in vegetable oils, young sprouts of cereals, nuts.
- zinc - enhances the migration and proliferation of thymus stem cells. Contained in aloe, dried apricots, violets, herbs, celandine, nut plants.
- Iron - stimulates immunity. Contained in sinuses, lyubelia, madder, hare, sushenitsa.
- Cobalt - stimulates immunity. Contained in chamomile, dried apricots, herbs, dog rose.

COMPLEX ENZYME PREPARATIONS (wobenzyme, phlogenzyme, vobemugos).

Mechanisms of action:

- induce phagocytosis (increase the cytotoxic activity of macrophages);
- activate 8-100 times NK cells;
- activate tumor necrosis factor (TNF);
- activate inducers IL-1;
- suppress the activity of complement;
- eliminate circulating immune complexes fixed on tissues;
- prevent the formation of new circulating immune complexes;

- participate in the destruction of circulating immune complexes (enzymes partially destroy, macrophages - removed);
- affect the immune system through T-helpers.

IMMUNOTROPIC DRUGS BASED ON MONOCLONAL ANTIBODIES Infleximab (Remicade) is a "chimeric" monoclonal body directed against tumor necrosis factor.

Rituximab is a "chimeric" monoclonal antibody of the IgG / k subclass that is directed against CD20 antibodies.

Basiliximab (Silumect, Novartis) is a "humanized" monoclonal antibody directed against the CD25 molecule, which is an alpha subunit of the yterleukin 2 receptor .

The Expert Council of the III Congress of CIS Immunologists (2000) during a round table entitled "Immunomodulators and Immunotropic Drugs: Problems and Prospects" decided to recommend the following to clinical immunologists and general practitioners:

- Do not prescribe immunomodulatory drugs without conducting an immune status test, so as not to harm the patient instead of helping.
- Carry out dynamic monitoring of immune status in the absence of clinical manifestations and only then decide on the appointment of immunotropic drugs.
- Carry out dynamic monitoring of the patient's immune status before starting immunotropic drugs, with severe clinical manifestations of the disease, if the patient's immune system is not detected.
- Consider the appointment of immunotropic drugs mandatory in persons with pronounced clinical manifestations of the disease and functional and quantitative changes in the parameters of the immune system. The type and dosage are determined in each case individually.
- Prescribing immunotropic drugs without assessing the immune status is possible only for prophylactic purposes:
 - in anticipation of an epidemic of any disease (eg, influenza);
 - before acute surgery;
 - in patients with AIDS and HIV-infected;
 - in severe cancer patients.

Practical experience proves that the indications for the appointment of immunotropic drugs are:

1. Their use in complex therapy simultaneously with antibiotics, antifungals, antiprotozoal, antiviral drugs in patients with acquired immunodeficiency in chronic infectious-inflammatory process.
2. From the first day of use of chemotherapeutic, etiotropic drug in patients with acquired immunodeficiency.
3. In immunocompetent individuals to prevent the development of infectious complications.
4. Indications for the appointment of immunomodulators that affect the phagocytic immune system is the clinical picture of immunodeficiency.
5. Indications for the appointment of immunomodulators is the need for rehabilitation activities:
 - in people with incomplete recovery after an infectious disease;
 - in often and long-term sick people before the autumn-winter season, especially in environmentally unfavorable regions;
 - in cancer patients to improve the quality of life.

6. At appointment of immunomodulators immunological monitoring is desirable, thus for normal indicators of the immune status to accept their physiological deviations in this or that phase of infectious-inflammatory process.

7. Decreased immunity in the examination of a healthy person is not necessarily an indication for the appointment of an immunomodulator.

Immunoprophylaxis includes various ways to affect the immune system to prevent diseases or their recurrence. It can be:

❖ **Specific**

- Primary vaccination
 - Differentiated -compulsory vaccines
 - Additional - to pneumococcus, meningococcus, Hemophilus influenzae
 - Annual - to the flu
 - According to the indications - against herpes simplex viruses
- Secondary - suppressive etiotropic, anti-infective therapy; maintenance of specific antibodies

❖ **Nonspecific** (probiotics (hilak) , hepatoprotectors (hepabene) , c orbents (mycoton) , c anogenic measures , dispensary observation).

Immunorehabilitation is a set of immunological (immunotherapeutic, immunoprophylactic), social, ecological, biomedical measures aimed at restoring the altered immunological reactivity of the patient or the population of a certain contingent of the population. Complex immunorehabilitation is carried out taking into account extra- and intrainmune therapy.

Requirements for immunorehabilitation:

- 1) Persistent disorders of the number of subpopulations and functions of various parts of the immune system.
- 2) The drug used must have a sufficiently studied mechanism of action, aimed at stimulating the suppressed part of the immune system.
- 3) Treatment should be performed under immunological control.

V I. Plan and organizational structure of the lesson

The main stages of the lesson, their functions and content	Levels of assimilation	Methods of control and training	Materials of methodical maintenance	Time in minutes
1. Preparatory stage Organization of classes Educational tasks Control of the input level of knowledge, skills: - immunotherapy as a method of treatment - types, methods of immunotherapy	1	Frontal poll Express survey Test control (input)	Tests Schemes	25
2. The main stage Formation of professional knowledge, skills, abilities: - know the interpretation of the concepts of immunostimulation, immunosuppression, immunomodulation -know the classification of immunotropic drugs - know the basic principles of immunotherapy, immunorehabilitation, immunoprophylaxis - know the forms of release, doses of immunotropic drugs - be able to write recipes	2 2 3 3 3	Individual survey (control questions) Professional training in solving typical problems ("Step-2")	Tables Schemes of appointment of immunotropic drugs according to the results of the immunogram Typical situational tasks	210

3. The final stage Control and correction of professional knowledge, skills, abilities - be able to prescribe drugs for immunopathology, phase of the process, age and laboratory immunological changes. - know the main indications and contraindications to the appointment of immunotherapy.	3	Testing (initial level) Individual survey Solving atypical situational problems	Schemes Tests Atypical situational tasks	35
Conducting the results of the lesson. Homework for the next topic.				

VII . Methods of organizing the educational process in a practical (seminar) lesson.

7.1. Preparatory stage.

Defining the concept of immunotherapy as a method of treatment, immunoprophylaxis, immunorehabilitation. Understand the types, methods, principles, indications and contraindications to the appointment of immunotropic drugs. Know the classification of immunotropic drugs.

Introduce students to specific goals and lesson plan.

Carry out an initial control of the level of students' preparation with the help of test tasks of the 1st and 2nd level.

7.2. The main stage

This stage involves the performance of each student independently and under the supervision of the teacher of the following practical work.

Task 1

Students conduct a survey and objective examination of a patient with immunological pathology, using examination, palpation, auscultation, percussion.

Task 2

№	Task	Standards of the answer
1.	Specify vitamins that are important in immunocorrection?	vitamin A, vitamin E, vitamin C, vitamin PP
2.	What laboratory tests can be used to select immunomodulators in vitro?	rosette test
3.	Nonspecific stimulating immunotherapy is associated with the use of:	Myelopeptides of thymic origin (thymomimetics)
4.	The basis for the appointment of immunotherapy is...?	Clinical signs of immune disorders
5.	Immunotropic drugs of recombinant origin include ..?	Preparations of interferons, interleukins
6.	What is the main point of application of the action of myelopeptides of thymic origin?	T-lymphocyte activity
7.	What is the secondary pharmacological effect when using drugs of thymic origin?	Increased phagocytosis
8.	In which cases is specific hyposensitization by allergens indicated?	In atopic diseases

9.	Immunotropic drugs are not prescribed ..?	Patients with laboratory signs of immune deficiency
10.	The main point of application of the drug polyoxidonium:	Phagocytosis
11.	What are the stabilizers of mast cell membranes?	Nalchrome, lomuzol, tyled
12.	Immunomodulators of microbial origin include ..?	Biostim, ribomunil, IRS-19, bronchomunal
thirteen.	What are the immunotropic drugs used in specific substitution immunotherapy?	Immunoglobulins. Serum, immune lymphocytes, macrophages.
14.	What is the antiviral drug, the purpose of which is indicated for cytomegalovirus infection?	Tsimeven
15.	What is the main mechanism of action of allergy vaccination?	Immunological
16.	The main point of application of the drug myelopid?	B-lymphocyte activity

Task 3

1. Immunocorrection (immunotherapy, immunomodulation) is ..?

The answer is a type of treatment aimed at restoring immune homeostasis, regulation or temporary replacement of certain parts of the immune system.

2. What types of immunotherapy do you know?

The answer is specific, nonspecific, intraimmune, extrimmune.

3. What are the basic principles of prescribing immunotropic drugs?

The answer is to prescribe them for immunodeficiency, prior use of detoxification therapy, not to prescribe without conducting a study of immune status, conducting dynamic monitoring.

Task 4

<i>Nº</i>	<i>Task</i>	<i>Answer</i>
1.	Specific immunotherapy is...?	gradual introduction of increasing doses of the causative allergen
2.	What is the basis for deciding on the appointment of immunocorrection?	Clinical signs of immune deficiency
3.	Individual selection of immunocorrective drugs is ..?	Selection in vitro
4.	For correction of insufficiency of B-link of immunity it is expedient to use ..?	B-activin (myelopid)
5.	Name an immunotropic drug related to immunosuppressants?	Sandimun
6.	The drugs that seal the membrane of mast cells include:	Intal, tailed
7.	Name an immunotropic drug of plant origin?	Manaks

8.	Specify the trace elements that are important in immunocorrection?	Zinc, iron, copper, selenium.
9.	Name an immunotropic drug, a product of microbial origin?	Bronchomunal
10.	Name an immunotropic drug of biological (physiological) origin?	Thymalin
11.	To correct the insufficiency of the T-link of immunity, it is advisable to prescribe...?	Imunofan
12.	Name a synthetic immunotropic drug?	Polyoxidonium
thirteen.	What are the immunotropic drugs that are used in specific stimulating immunotherapy?	Vaccines
14.	What drugs are used to treat hereditary angioneurotic edema caused by deficiency With α_1 -esterase?	Epsilon-aminocaproic acid Danazol Fresh frozen plasma
15.	What are the immunotropic drugs that are used in specific suppressive immunotherapy?	Allergens
16.	Immunotropic drugs of natural origin include ..?	Immunoglobulin preparations
17.	What are the drugs used in non-specific immunotherapy?	Adjuvants, thymomimetics, myeloids of bone marrow origin.
18.	Name the drugs used in non-specific replacement therapy:	Leukocytes
19.	The main point of application of the immunotropic action of dibazole?	Activity of natural killers
20.	List the methods of immunotherapy?	Medicinal, non-drug, incorporal, extracorporeal.
21.	What are the immunotropic drugs used in non-specific inhibitory therapy?	Cytostatics
22.	What immunotropic drugs are immunosuppressants?	Glucocorticosteroids, sandimun, selsept, imuran
23.	Name adjuvants of inorganic origin?	Aluminum hydroxide, calcium phosphate Calcium chloride, alum-calcium alum Quartz powder, activated carbon
24.	What are the herbs that have an immunomodulatory effect?	Marsh marigold, astragalus, purple echinacea

		Grapes, sage, beans Aloe vera, sweet naked, garlic
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Problem №1.

The patient was 42 years old with ulcerative colitis, acute form, severe course, total intestinal lesion, activity of the third degree, toxic dilatation of the large intestine. What should be prescribed in case of a significant increase in gamma globulin?

Answer: Cytostatics

Problem №2.

A 32-year-old woman suffered from an acute form of viral hepatitis B. Within two months, the control revealed a high concentration of HBV-DNA. What are the tactics of the patient?

Answer: Prescribe a course of interferon therapy.

Problem №3.

A 32-year-old patient working as a driver complained to a dermatologist about the presence of a painful vesicular rash on the skin of the left face, fever, edema. The diagnosis of shingles has been established. Which of the following medications will be most effective?

Answer: Acyclovir

Problem №4.

A 48-year-old teacher, a teacher by profession, who often suffered from colds, went to a dermatologist with complaints of rashes on the skin and mucous membranes of the oral cavity. After examination, the patient was diagnosed with vulgar vesicles. As a result of the treatment, clinical recovery occurred. Which of the drugs should be prescribed to the patient to prevent recurrence of dermatosis?

Answer: Prednisolone

Problem №5. Which of the following drugs is most active in shingles?

Answer: Acyclovir

Problem №6.

A patient with infectious-allergic bronchial asthma was hospitalized in the clinic. Which of the following immunotropic drugs is most suitable for the prevention of frequent recurrent respiratory viral infections in a patient?

Answer: Ribomunil

Problem №7.

Patient M., 42 years old, complains of general weakness, sweating, irritability, decreased efficiency, recurrent bacterial infections. For the last 3 years she has suffered from otitis, sinusitis, pneumonia twice, and repeatedly acute respiratory infections. The study of immunological parameters revealed a decrease in IgA, phagocytic activity of neutrophils and macrophages, the synthesis of interleukin-1, interleukin-6. Which of the drugs is recommended for the patient to stimulate antimicrobial immunity?

Answer: Ribomunil

Problem №8.

A patient with systemic lupus erythematosus was hospitalized in the clinic. She was prescribed parenterally prednisolone at a dose of 1200 mg. What is the main effect of prednisolone at this dose?

Answer: Immunosuppressive

7.3. The final stage.

The current activity of each student during the lesson is evaluated, the analysis of students' progress is analyzed, the evaluation of each student's activity is announced and it is placed in the journal of attendance and student progress. The head of the group at the same time enters grades in the statement of performance and attendance of students, the teacher certifies them with his signature.

It is advisable to briefly inform students about the topic of the next lesson and methods of preparation for it.

VIII . Additions

8.1. Theoretical issues of the preparatory stage:

1. What is immunotherapy.
2. Types, methods of immunotherapy.
3. Basic principles of immunotherapy.
4. Classification of immunotropic drugs.
- 5 What is the basis for the appointment of immunotropic drugs.
6. What is immunorehabilitation, immunoprophylaxis.

8.2 Formulate a clinical diagnosis

Level 3 tasks

Problem №1.

Patient P., 42 years old, complains of fever up to 38 °C, dry cough with difficulty sputum production, chest pain when coughing, rhinorrhea, weakness. I fell ill about 3 days ago after hypothermia. Objectively: nasal breathing is difficult. In the lungs during percussion dull percussion sound in the lower parts of both lungs. At auscultation in lungs hard breath, in the lower parts - crepitation. Rhythmic heart activity, heart rate-88 beats / min, blood pressure-125/85 mm Hg Radiologically: OGK - bilateral lower lobe pneumonia. What are the changes in humoral immunity in a patient?

Answer: Decreased IgG, significant rise in IgM, normal IgA levels

Problem № 2 .

Patient K., 52 years old, complains of weight gain, weakness, constipation, memory impairment. These symptoms have been slowly increasing over the past 1.5 years. Objectively: dry skin, moderate swelling of the face and extremities, dilated heart, tones muffled, heart rate 66 per 1 min. Blood pressure 110/70 mm Hg The thyroid gland is not palpable. ELISA detected antibodies to thyroglobulin (+) and microsomal antigen (+++); the level of TSH is 15.2 mO / l. Ultrasound: gland of reduced size, heterogeneous structure. Make a diagnosis.

Answer: Autoimmune thyroiditis, hypothyroidism.

Problem № 3 .

Patient H, 47 years old, was diagnosed with nephrotic syndrome. What changes in humoral immunity will be observed in the patient?

Answer: Decreased IgG, IgA; normal and elevated IgM concentration

Problem № 4 .

A 35-year-old woman was taken to the surgical department in serious condition with complaints of severe diffuse pain throughout the abdomen, nausea and vomiting. Deterioration occurred 2 days before hospitalization, when the skin of the extremities appeared small hemorrhagic rash, there were cramping abdominal pain, bloody discharge from the rectum.

2 weeks before that she had an acute viral infection. Objectively: blood pressure 90/60 mm Hg. Art., heart rate 95 per minute, the abdomen on palpation is tense, there are symptoms of peritoneal irritation. Blood tests show neutrophilic leukocytosis and eosinophilia, a decrease in the number of erythrocytes and hemoglobin. What are the main pathogenetic mechanisms of this disease?

Answer: Immunocomplex vascular damage

Problem № 5 .

A 53-year-old accountant by profession, on the background of a satisfactory general condition, had a painful rash in the mouth, and later - on the skin of the torso. A dermatologist diagnosed vulgar vesicles. Examination revealed chronic gastritis. Which of the mechanisms of dermatosis can be considered the most likely in this case?

Answer: Autoimmune

Problem № 6 .

The allergist was approached by patient M, 40 years old, who complains of tearing when leaving the house on the street, shortness of breath, redness and itching of the skin. Diagnosed with hay fever. Name the general features of atopic diseases:

Answer: The presence (production) of IgE - reagents

Problem № 7 .

The patient has diffuse toxic goiter. Receives mercazolyl at a dose of 50 mg per day. After 3 weeks of treatment, the body temperature rose to 38.1 C, there was a sore throat, sore mouth ulcers. General blood test: er. - $3.1 \times 10^{12} / l$; HB - 94 g / l; CP - 1.0; lake. $1.0 \times 10^9 / l$; ESR - 28 mm / year. What is the most likely cause of deterioration of the patient's condition?

Answer: Development of agranulocytosis.

X I . Conclusions:

- 9.1. Mastered knowledge about immunotherapy as a method of influencing the immune system.
- 9.2. Formed understanding of the concepts of immunoprophylaxis, immunorehabilitation.
- 9.3. The initial understanding of individual purpose of immunotropic drugs depending on immunopathology, phase of process, laboratory immunological changes and age of the patient is formed.
- 9.4 Mastered knowledge of indications and against indications for the appointment of immunotropic drugs.
- 9.5. Acquired understanding of the need for timely appointment of immunotherapy

Tasks for independent work on this topic :

1. To make the list of characteristic immunotropic drugs of immunostimulating, immunosuppressive, immunomodulatory action.
2. Develop a table (scheme) of drug administration depending on age.
3. To form the main indications and against indications for the appointment of immunotropic therapy.

H. List of educational and methodical literature

Basic:

1. Fundamentals of immunology / Functions and disorders of the immune system / Abul K. Abbas and co-authors. Scientific editor of translation Valentina Chopyak / 2020. - Medicine. - 327c.
- 2 . Clinical immunology and allergology.//GN Drannik: - K. - 2009.- 357p.

Additional:

1 .. Allergology and clinical allergology // ed. acad. Khaitova RM, Ilyina NI // GEOTAR "Media", 2018.- 352p.

2..Gavin Spickett. Clinical immunology and allergology. Oxford Directory. - 2019, 832 p.

3. Immunology.- Nat. textbook // ed. Kuznetsova LV, Babadzhana VD, Litus VI - Kyiv.- 2015.-584 p.

4 .. Clinical immunology and allergology (manual for practical classes // Chopyak VV, Potemkina GO, Gavrilyuk AM - 2017. - 224p. 5. Fundamentals of clinical immunology. Principles of diagnosis and treatment of immunopathology (manual for extracurricular work of students, interns) / Bondarchuk OB - 2016. - 52p.

5. Fundamentals of clinical immunology. Principles of diagnosis and treatment of immunopathology (manual for extracurricular work of students, interns) / Bondarchuk OB - 2016. - 52p.

6 . Allergy. Official Journal of the European Academy of Allergy and Clin Immunol.- 2019

7 . Singh AB Allergy and allergen immunotherapy new mechanisms and strategies.-2017., Edition 1, publ Apple Academic Press Inc. , pades 528.

16. Information resources

Website address: www.phthisiatry.at.ua / departments / departments of tuberculosis with a course of clinical immunology.

Libraries: library.vsmu.edu.ua

Methodical:

1.Mileryan VE Methodical bases of preparation and carrying out of educational employment in medical universities (methodical manual) .- K .: "Khreschatyk", 2004.-80 p.

Training manuals:

1. A set of class presentations for multimedia use.
2. Test control Step-2 (computer version) and a collection of situational tasks for learning.
3. Methods of development for conducting practical classes.
4. Set of tables, slides

Methodical recommendations prepared

associate professor A. Bogomolov

Methodical recommendations were reviewed and approved at the meeting of the department

“28” 08 ”2022 Protocol № 1

Head of Department

Ph.D. Associate Professor of HEI Kulik LG



