Topics for practice lessons

for subject «Clinical immunology and allergology»

for 5 course foreign faculty students

TOPIC 1.

Immunology as a discipline in the structure of medical knowledge. The organs of the immune system, and methods of its research. Cells involved in immune processes. Molecule effectors and regulators of the immune system. The mainhistocompatibility complex.

Questions:

1. Immunology: definition, history, development and achievements.
2. Organization of medical aid to patients with immunopathology in the Republic of Belarus.
3. The organization of the immune system. Central and peripheral organs of the immune system, structure, function (bone marrow, thymus, spleen, lymph nodes, lymphoid tissue associated with mucous and skin).
4. Methods of researching organs of the immune system.
5. Cell - participants of immune processes, their origins and functions (stages of hematopoiesis, neutrophils, basophils and mast cells, eosinophils, monocytes and macrophages, dendritic cells, platelets, red blood cells, T-lymphocytes, b-lymphocytes, NK-cells, epithelioid cells, endothelium, fibroblasts).
6. Ways of recirculation of lymphocytes, the distribution of lymphoid cells in various organs and tissues.
7. The concept CD "cluster determinants", "clusters of differentiation".

8. Immunoglobulins.
9. Complement system.
10. Proteins of acute phase of inflammation.
11. Cytokines and cytokine network. Integrins, selectins, chemokines, growth factors.
12. Main histocompability complex.

Textbook: Janeway's Immunobiology, 8th Edition, 2012.

TOPIC 2.

Anti-infective immunity: factors of nonspecific resistance, innate and adaptive immune response. Immunological memory. The control and regulation of the immune response. Manifestations of immune protection against various pathogens.

1. Recognition of the alien in the system of innate immunity: pathogen-associated molecular patterns and stress molecules, receptors for their recognition.
2. The first line of immunity - innate immunity. Factors of nonspecific resistance. Myeloid cells as the basis of innate immunity. Other cells involved in immune processes during inflammation (epithelial, endothelial). Cellular mechanisms of innate immunity (adhesion molecules, chemoattractants and chemokines, emigration and chemotaxis of leukocytes, phagocytosis and its functions - bactericidal, secretory, killer). The contribution of lymphoid cells in innate immunity. Natural killer cells.

3. Humoral factors of innate immunity, the complement system, acute phase proteins inflammation, biogenic amines, eicosanoids, cytokines and interferons.
4. Antigens and receptors for recognizing it. Superantigen.
5. Adaptive immunity. Lymphoid cells (specification, development, a subpopulation of molecules for recognition of antigens). The antigens recognized by B-lymphocytes.
6. The main histocompatibility complex and antigen recognized by T-cells.
7. Activation of lymphocytes and the start of the immune response (antigen presentation, activation of T-lymphocytes, differentiation of T-helper cells). Cellular immune response (cytotoxic and inflammatory T-cell immune response).
8. Humoral immune response (activation of B-lymphocytes, the role of T cells and cytokines, differentiation of plasma cells and secretion of antibody effector functions of an antibody).
9. The relationship between innate and adaptive immunity. Immunological memory and secondary immune response.
10. The control and regulation of the immune response. Genetic and neuro-endocrine control of the immune response. Regulatory T-cells.
11. Manifestations of immune protection against various pathogens. Extracellular and intracellular bacterial pathogens and features immunity to them. Antiviral immunity. Antifungal immunity. Immune protection is the simplest and against helminths.
12. Mechanisms of avoidance of infectious agents, immune protective factors.

Textbook: Janeway's Immunobiology, 8th Edition, 2012.

TOPIC 3.

Primary immunodeficiencies. Secondary immunodeficiencies.

1. Primary immunodeficiencies, definition and epidemiology. Classification according to IDC-10.
2. Common problems of genetics of primary immunodeficiencies.
3. Localization of immune defects in primary immunodeficiencies.
4. Impaired immune protection and manifestations of immunopathology in primary immunodeficiencies.
5. Primary immunodeficiencies associated with damage to the innate immunity. The defects of the system of phagocytosis (disease Chediak-Higashi, deficiency of glucose-6-phosphate dehydrogenase, chronic granulomatous disease).
6. The defects of the complement system (defects of the classical pathway activation, defects of alternative pathway activation, defects of education POPPY, hereditary angioedema).
7. Primary immunodeficiencies associated with lesions of adaptive immunity. Immunodeficiency with defective antibody productions (hereditary hypogammaglobulinaemia - disease Bruton, selective IgA deficiency, selective IgM deficiency, transient hypogammaglobulinemia children).
8. Other immunodeficiency associated with other major defects (syndrome Wiskott-Aldrich syndrome Di George, Hyper IgE syndrome, common variable immunodeficiency, Louis-Bar syndrome).

9. Primary immunodeficiencies, for the first time manifestirutaya in the late postnatal period and in adults.
10. Research methods humoral immunity (immunoglobulins, acute phase proteins, components of the complement system).
11. Research methods cell component of the immune response, the regulations, the diagnostic significance of, indications for use (flow cytometry, proliferative and load tests, skin tests).
12. Research methods humoral immunity (immunoglobulins, acute phase proteins, components of the complement system).
13. Research methods cell component of the immune response, the regulations, the diagnostic significance of, indications for use (flow cytometry, proliferative and load tests, skin tests).
14. The study of phagocytosis. Methods for detection of antigens.
15. The General principles and features of the treatment of patients with primary immunodeficiencies. Replacement therapy with intravenous immunoglobulins. Transplant treatment methods (transplanting bone marrow, thymus) and gene therapy of primary immunodeficiencies.
16. Secondary immunodeficiency diseases and conditions.
17. HIV infection and acquired immunodeficiency syndrome.
18. Immunodeficiency caused by the death of immune cells.
19. Secondary immunodeficiencies, due to functional disorders of lymphocytes.
20. Examination for suspected secondary immunodeficiency (clinical manifestations, laboratory diagnosis).

Textbook: Janeway's Immunobiology, 8th Edition, 2012.

Internet: http://primaryimmune.org/about-primary-immunodeficiencies/

Internet: http://www.aaaai.org/conditions-and-treatments/primary-immunodeficiency-disease.aspx

TOPIC 4.

Autoimmune disease. Allergic diseases: epidemiology, organization of medical care to allergic patients. Allergens.

1. Autotolerance and its mechanisms.
2. Immunologically privileged organ. The reasons of disorders autotolerance.
3. Genetic aspects of autoimmune diseases.
4. Immunological mechanisms of damage in autoimmune processes.
5. Organ-specific autoimmune diseases - diabetes mellitus type I and II), autoimmune thyroid disease, multiple sclerosis, Addison disease, psoriasis, vitiligo, myasthenia gravis, Crohn's disease.
6. Systemic autoimmune diseases, such as scleroderma, Sjogren syndrome, systemic lupus erythematosus.
7. Laboratory diagnosis of autoimmune diseases.
8. Principles of treatment of autoimmune diseases.
9. Epidemiology of allergic diseases. Organization of medical care for patients with allergic diseases in the Republic of Belarus.
10. Allergens, structure, origin, classification, nomenclature.

Textbook: Janeway's Immunobiology, 8th Edition, 2012.

TOPIC 5.

Allergic diseases: immunochemical basis of allergic reactions hypersensitivity. The main allergic diseases.

1. IgE-mediated reactions hypersensitivity (terminology, properties of IgE, the role of IgE in norm and at a pathology, reagin reactions and their stages, mediators of allergic reactions).
2. Hypersensitivity associated with non reagin antibodies.
3. Pseudoallergy.
4. Diagnosis of allergic reactions of immediate type hypersensitivity and the delayed-type hypersensitivity.
5. The main allergic diseases: allergic rhinitis, allergic conjunctivitis, bronchial asthma, pollinosis, urticaria and angioedema, food allergy, atopic dermatitis, allergic contact dermatitis, anaphylactic shock.

Textbook: Patterson's Allergic Diseases (Allergic Diseases: Diagnosis & Management), 7th Edition, 2009.

Textbook: Janeway's Immunobiology, 8th Edition, 2012.

Internet: http://www.worldallergy.org/

Internet: http://www.eaaci.org/

Internet: http://www.ginasthma.org/

TOPIC 6.

Allergic diseases: diagnostic, principles of treatment and prevention. Drug allergy. The state of emergency in allergology.

1. Diagnostic of allergy: methods, indications, contraindications, diagnostic significance: allergic anamnesis, laboratory diagnostics, functional diagnostics - spirography and peakfloumetry, skin testing, provocative and elimination-provocative tests.
2. Principles of treatment of patients with allergic diseases, drug therapy, immunotherapy with allergens of allergic diseases (methods, indications, limitations of the method).
3. Drug Allergy. Classification of adverse reactions to medicines (R. Patterson). Risk factors for drug Allergy. Clinical classification of allergic reactions to drugs. Fundamentals of diagnosis of drug Allergy. Clinical variants of allergic reactions to medicinal substances. Principles of treatment and prevention of drug allergy.
4. The state of emergency in allergology, clinical manifestations, diagnosis, emergency care, treatment: anaphylactic shock, angioedema, asthmatic status.
5. Prevention of allergic diseases.

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