TOPIC OF THE PRACTICAL LESSON № 3:
Bacteriologic diagnosing of tuberculosis. Mantoux test.

Actuality of theme. In recent years, tuberculosis has been on the rise in Ukraine threatening medical - social and national - economic problem, which is a national danger. Doctors of different profiles need it knowledge of recognizing this disease to prevent its spread tuberculosis and unification of approaches to the provision of tuberculosis care for the sick.

The purpose of the lesson: to teach students the laboratory methods of examination of patients on pulmonary tuberculosis and correct interpretation of the obtained data; elements of deontology in communication with patients; develop skills recognition of "opened and closed" forms of pulmonary tuberculosis in accordance with modern classification. Introduce students to laboratory methods of tuberculosing lungs, to teach students tuberculin diagnosis, staging techniques tuberculin tests, evaluate their results.

The student must know:
- the methods of bacteriological and molecular-genetic researches;
- the types of tuberculin and their features;
- the indications and contraindications for Mantoux tuberculin tests and Koha;
- the criteria for negative, positive and hypersensitive tuberculin reaction;
- the tuberculin conversion, definition, characteristics;
- the post-vaccination and post-infection reaction to tuberculin.

The student must be able to:
- to study a smear from the patient's sputum under a microscope;
- to evaluate the results of sputum sowing;
- to conduct and evaluate the Mantoux tuberculin test, based on it results identify individuals who need additional screening at tuberculosis.

Interdisciplinary integration.

Subject	Know	Be able
Previous:		
Anatomy	The anatomy of the respiratory system.	
Physiology	The physiology of the respiratory system.	
Pathological physiology	The pathophysiology of diseases of the respiratory	

	system.	
Microbiology	The morphological structure, properties, pathogenicity and virulence MBT, methods of their detection in sputum and other pathological materials.	To collect material for bacteriological research. Evaluate the results obtained.
Allergology and immunology	Immunity in tuberculosis. Immunological reactions are increased delayed type sensitivity. The concept of infectious and post-vaccine allergy.	To conduct and evaluate the Mantoux tuberculin test.
The following:		
Internal medicine	The clinical manifestations and laboratory methods.	To carry out differential diagnosis lung diseases.
Intra-subject integration:	The clinical manifestations of tuberculosis.	To differentiate clinical forms tuberculosis, determine the type localization, phase process, display it is in the diagnosis.

Content of the lesson topic:

Questioning. The variety of manifestations of pulmonary tuberculosis in depending on the stage and spread of the process. Clinical symptoms of the disease: a) associated with intoxication syndrome (fever, weakness, reduced efficiency, sweating, loss of appetite, loss body weight, sleep disturbances, irritability); b) local manifestations of the disease,

associated with lung damage (cough, sputum production, hemoptysis, chest pain, shortness of breath).

Anamnesis. The onset of the disease. Diseases transferred in the past ("Flu", recurrent pneumonia, concomitant diseases). Value contact with persons allocating MBT. Working and living conditions of the patient. Smoking, alcohol, drug addiction. Results and date preliminary fluorographic examination (in adults), information about BCG vaccination and the results of tuberculin testing (in children).

Objective survey data. Review. General condition. Provisions in bed. Body temperature. Consciousness, skin, visible mucous membranes. Subcutaneous fat. Edema. Peripheral lymph nodes. Head, neck, condition of the thyroid gland. Chest: shape, symmetry, uniformity of participation in the act of breathing. Palpation data (pain, tremor). Topographic and comparative data chest percussion. Auscultation: strength and nature of breathing, wheezing, crepitation, their localization,

bronchophonia. Cardiovascular system. Apical push. Epigastric pulsation. Borders of the heart. Data auscultation. AT. Pulse.

Diseases of other organs that are accompanied by relevant clinical symptoms.

Tuberculin diagnosis. Mantoux tuberculin test with 2 TU PPD-L. Staging technique. Application of the Mantoux test to determine primary infection, early detection of tuberculosis. Selection of persons to be revaccinated. Using the Mantoux test for detection persons at increased risk of tuberculosis and those who require examination and supervision by a tuberculosis specialist. Infectious and post-vaccination sensitivity to tuberculin, differential diagnosis. Use of tuberculin tests for differential diagnosis tuberculosis with other diseases. Koch's test.

Microbiological research. Methods for detecting mycobacteria tuberculosis in sputum and other pathological materials, their significance results to confirm tuberculosis and differential diagnosis. Indications for microbiological examination of sputum and urine in persons with risk of tuberculosis. Variability of mycobacteria and their significance for the clinic and treatment tactics. Determination of the sensitivity of MBT to anti-TB drugs.

Plan and organizational structure of the lesson:

Preparatory stage (10-20% of working time): organization of classes, goal setting, control of the initial level of knowledge.

The main stage (60-90% of working time): the formation of professional skills and skills. Students independently and under the supervision of the teacher carry out supervision of the patient, collect the anamnesis, master the skills of the objective review, to evaluate the results of laboratory methods of MBT detection (microscopic, bacteriological, molecular-genetic), substantiate clinical diagnosis.

The final stage (10-20% of working time): level control and correction professional skills and abilities, summarizing, homework.

Materials of methodical providing of employment.

Test control.

1. What data are not taken into account when conducting differential diagnosis between infectious and post-vaccine reactions to tuberculin?

A. Contact with patients with tuberculosis.

B. The intensity of the reaction to the Mantoux test in previous years.

C. The presence of a post-vaccine scar.

D. Time of BCG vaccination.

E. Presence of pneumonia in the anamnesis.

2. A two-year-old child has a reaction to the Mantoux test with 2 TU PPD-L - infiltrate with a diameter of 7 mm, in three years - 3 mm. Post-vaccination scar size 4 mm. What is the nature of the reaction to tuberculin is observed in children?

A. Infectious allergies.

B. “conversion” of the tuberculin reaction.

C. A child with tuberculosis.

D. Post-vaccination allergy.

E. Mantoux reaction is positive.

3. The patient is 43 years old. Undergoing a course of antimycobacterial therapy with drive FDTB (12.12.2021) Fibro-cavernous of the upper lobe of the left lung (infiltration and decay phases), Destr+, MBT+, M+, C+, GeneXpertMBT+/Rif-, Resist I(0), Resist II(0), Hist0, Cat1, Coh4 (2022). What research is needed first to spend to the patient for appointment of optimum combination chemotherapy?

A. Determine the type of MBT.

B. Determine the presence of secondary flora.

C. Determine the sensitivity of MBT to antimycobacterial drugs.

D. Determine the massiveness of bacterial excretion.

E. Determine the virulence of MBT.

4. A 32-year-old patient was diagnosed with pulmonary TB (disseminated, phase of infiltration and decay), Destr+, MBT+, M+, C+ GeneXpertMBT+/Rif-, Resist I(0), Resist II(0), Hist0, Cat1 Coh1 (2023). Which method allows you to determine the sensitivity mycobacteria to anti-TB drugs?

A. Bacterioscopic.

B. Bacteriological.

S. PCR.

D. ELISA.

E. Biological.

5. The child is 3 years old, vaccinated at the maternity home. On the left shoulder there is post-vaccination scar with a diameter of 7 mm. In 1 year Mantoux test with 2 TU PPD-L was 10 mm, at 2 years - 8 mm, at 3 years - 14 mm. What about most likely such dynamics of tuberculin test testifies?

A. The child's disease of the secondary form of pulmonary tuberculosis.

B. The presence of post-vaccination immunity.

C. The presence of infectious immunity.

D. The presence of a hyperergic reaction to tuberculin.

E. Formation of negative energy.

6. Which method of detecting the MBT is the most sensitive and specific?

A. Luminescent microscopy

B. Cultural research

C. Biological test

D. PCR

E. ELISA

7. The patient is 44 years old. He is being treated for a week. Diagnosis: FDTB (15.01.2023) lungs (disseminated, infiltration and decay phase), Destr+, MBT+, M+, C0, Resist0, Hist0, Cat1, Coh1 (2023). MBT was detected by bacterioscopic method in 2 samples. What is the most probable reason that C0 was recorded in the diagnosis?

A. Cultural analysis was not performed

B. Received a negative result of sputum culture

C. Lack of MBT in sputum

D. Insufficient time for MBT growth

E. Incorrectly determined bacterioscopy results

8. What does the appearance of colonies on the 3rd day after sowing indicate?

A. Growth of mycobacteria that multiply rapidly

B. Growth of highly virulent mycobacteria

C. Growth of atypical mycobacteria

D. Growth of non-specific microflora

E. Growth of L-forms of mycobacteria

9. Child 5 years old, not vaccinated with BCG vaccine. A year ago, the Mantoux test with 2 TU PPD-L was negative, and now the diameter of the infiltrate is 15 mm. How to evaluate the results of tuberculin testing?

A. The Mantoux test is hyperergic

B. The Mantoux test is questionable

C. "conversion" of the Mantoux test.

D. Mantoux test negative

E. Prick test for Mantoux test

10. What is the purpose of the Koch subcutaneous test?

A. To determine the activity of a specific process

B. To identify people at increased risk for tuberculosis

C. To study the infection of the population with Mycobacterium tuberculosis

D. For early detection of tuberculosis.
E. To determine the threshold of tuberculin sensitivity

Approximate map for the organization of independent work of students with educational literature:

Educational tasks	Instructions for the task	Answer
Examine: Examination methods patients with respiratory disease	The ways and methods detection of tuberculosis. Population categories with increased risk of disease tuberculosis. Complaints, medical history, course, epidemiological anamnesis, transferred diseases, working and living conditions. Physical examination methods: palpation, percussion and auscultation	
Tuberculosis clinic	The clinical signs caused intoxication syndrome, local manifestations of the disease associated with respiratory lesions.	
Indications for application of the Mantoux and Koch test	The purpose of tuberculin testing. The concept of tuberculin. Modern tuberculin tests. Mantoux test with 2 TU PPD - L: indications, technique conducting, evaluation of results. The concept of "conversin" of tuberculin samples. Differential diagnosis post-vaccination and post-infectious immunity.	
Methods of detecting MBT in sputum and others pathological materials	The microbiological diagnostics: methods bacterioscopic, bacteriological and biological detection of MBT, value their result for the diagnosis of tuberculosis. Rules of material collection. Accelerated methods for detecting MBT: BACTEC, enzyme-linked immunosorbent assay, polymerase chain reaction (PCR). Variability of MBT, its significance for treatment tactics. Determination of sensitivity MBT for anti-TB drugs. Dynamics of research in the process treatment.	

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