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**METHODOLOGICAL RECOMMENDATIONS FOR TEACHERS
FOR THE PRACTICAL STUDIES OF PREPARATION FOR
PHTHISIOLOGY GENERAL PRACTITIONERS**

<i>Academic discipline</i>	Phthisiology
<i>Subject lesson number</i> 10	Tuberculous pleurisy. Pathogenesis, pathomorphism, clinic, diagnosis, differential diagnosis. Current treatment regimens.
<i>Course</i>	4

Topic № 10: Tuberculous pleurisy. Pathogenesis, pathomorphism, clinic, diagnosis, differential diagnosis. Current treatment regimens.

Currency of the topic

Diseases of pleura are known to be the most frequent lesions of serous membranes of the organism. Complications of pleural cavity can cause more than 70 various diseases, including extra-thoracal and even system processes. In the last years, tuberculous pleurisy in structure of initial patients tends upwards from 6 up to 10,5%. The course of tuberculosis from primary infection to chronic destructive forms development is characterized by its fairly frequent involvement in reactive inflammatory process of pleura. Pleural effusion syndrome (PES), being complication of various diseases, including malignant diseases of lungs, mediastinal organs, abdominal cavity, demands early diagnostics and treatment.

General goal:

To create for students the appropriate terms, which provide knowledge gaining, and abilities, allowing to recognize the clinical forms of secondary tuberculosis and analyse the results obtained.

The concrete aims:

1. To generalize the results obtained from patient examination, data of physical and instrumental examination of patients with tubercular pleurisy (including empyema).
2. To identify the basic syndromes of tubercular pleurisy (including empyema).
3. To diagnose tubercular pleurisy (including empyema).
4. To formulate the clinical diagnosis of tubercular pleurisy (including empyema) according to the classification.
5. To institute complex therapy of various forms of tubercular pleurisy (including empyema).
6. To diagnose complications of tubercular pleurisy (including empyema), and to render urgent aid in emergency cases.

Basic knowledge and skills are necessary for topic studying

For achievement of the specific objects of a topic, the student should possess the following knowledge and skills:

1. To be able to interview patients with tuberculosis of lungs.
2. To be able to conduct chest examination: to define form, to reveal deformations, respiration act lagging of any halves of the thoracic cage.
3. To be able to lead palpation, percussion, auscultation of the thoracic cage.
4. To evaluate finding, to define pathogenesis of the revealed symptoms.
5. To be able to generalize the results obtained.
6. To know the genesis of the target clinical form of tuberculosis.
7. To be able to define a concrete syndrome of lesions.
8. To define the infectious agent of tuberculosis, its types. To describe the basic properties of mycobacteria tuberculosis (MBT), to apply methods of revealing MBT.

9. To describe features pathomorphological changes in lungs caused by tuberculous pleurisy (including empyema).

10. To classify antitubercular preparations, to apply them in treatment of secondary tuberculosis.

The tasks for independent student's work during the preparation for the class.

5.1. The list of the main terms, parameters, characteristics which the student has to master during the preparation for the class.

1.Secondary tuberculosis Secondary tuberculosis – the disease developed in the previously infected organism by mycobacteria tuberculosis.

2.Pleurisy (including tubercular) Pleurisy (including tubercular) represents the syndrome of hyperpermeability of blood and lymphatic vessels of the subpleural zone of lungs and connective-tissue of pleural membranes which includes a large group of the pathological processes with different etiology, patogenesis and research results.

3. Purulent tubercular pleurisy (empyema) Purulent tubercular pleurisy (empyema) – the tuberculosis of pleura, following by the purulent effusion accumulation, is the special form of exudative pleurisy. This disease develops against the background of widespread caseous necrosis of pleura, owing to disintegration and progressing of the large focuses on pleura or the focuses located subpleurally, involving pleura in inflammatory process with subpleural localization of the cavity.

Practical tasks which are doing during the class

Task № 1. To develop the plan of conversation with tuberculosis patients in which to carry out a research into the causes of tuberculosis, features of its course, need for treatment, duration and results of therapy.

Task № 2. To put questions, carried on external examination: to carry out analysis of general intoxication and chest complaints, features of the beginning and further development of disease in the patient.

Contents of the topic

Diseases of pleura are known to be the most frequent lesions of serous membranes of the organism. Complications of pleural cavity can cause more than 70 various diseases, including extra-thoracal and even system processes. In the last years, tuberculous pleurisy in structure of initial patients tends upwards from 6 up to 10,5%. Course of tuberculosis from primary infection to chronic destructive forms development is characterized by its fairly frequent involvement in reactive inflammatory process of pleura. Inflammatory reaction of pleura is stipulated by mycobacteria tuberculosis penetrated through lymphogenic, hematogenic or contact ways, and hypersensitization of pleural leaves by products of mycobacteria tuberculosis activity. Initiating agents, promoting development of pleurisy, are considered the supercooling, physical overloads, malnutrition, hyperinsolation. Tuberculous pleurisy seldom occurs as independent display of tuberculosis; as often as not it occurs as a combination of disseminated, nodular, infiltrative tuberculosis, and primary tuberculosis.

In the course of exudative pleurisies, 3 stages can be discriminated:

- 1) increase of clinical manifestation and accumulation of exudate;
- 2) stabilization;
- 3) resorption effusion and absence of clinical manifestation.

The clinical course of pleurisy is characterized by general intoxication symptoms, as well as the chest ones. Diagnostics of pleurisy includes obligatory diagnostic minimum and a pleural puncture with the purpose of diagnostics, pleuroscopy and needle biopsy as needed. Purulent tubercular pleurisy (empyema) is tuberculosis of the pleura, following by accumulation of purulent exudate, develops in widespread caseous necrosis of pleura owing to disintegration and progress of the focuses on pleura or the focuses located subpleurally. The clinical picture of the disease in most patients is characterized by heavy intoxication, febrile temperature, nocturnal perspiration, body weight loss, sudden weakness, and tachycardia. The dyspnea and stitches gradually develop. Revealing purulent exudate is possible by a pleural puncture and evacuation of the liquid. If not evacuated promptly, the purulent exudate can cause complications such as formation of bronchopleural or thoracic fistula. In tuberculosis of pleura, especially in serous neutrophilic or purulent exudate accumulation, besides chemotherapy, the basic method of treatment is repeated aspiration of exudate with creation of negative pressure in the pleural cavity for as quick as possible straightening of a lung and obliteration of pleural leaves. In regular aspirations, the purulent exudate gradually turns serous and hemorrhagic. The aspiration should be continued up to the full spread of the lung and obliteration of pleural cavity. However, some patients undergone aspiration can experience difficulties under the influence of systematic aspiration, especially those with bronchopleural fistula which prevents from creation of negative pressure in the pleural cavity, therefore the patients mentioned above can experience difficulties with straightening of the lung; such cases demand surgical intervention.

6. Materials for self-control

A. Tasks for self-control – the control of initial knowledge level of the topic.

1. To sketch the scheme of pathological changes in secondary tuberculosis: localization of effusion in pleurisy (apical, interlobar, osteodiaphragmatic, costal, paramediastinal, supradiaphragmatic).

2. To sketch the scheme of localization of changes of pleural cavity in empyema.

3. Definition of secondary tuberculosis?

A. Relapse of tuberculosis.

B. Destructive tuberculosis.

C. Tuberculosis discovered in a long run after infection?

D. Tuberculosis with the full-scaled picture.

E. Generalized tuberculosis.

The standard of the answer: C.

4. How can tubercular etiology of pleurisy be proved?

A. Changes of the tubercular nature in lungs or other organs

B. Revealing MBT in the pleural liquid or sputum

C. The apparent reaction to Mantoux test or recent conversion of tubercular tests

D. Needle biopsy of pleura

E. All of mentioned above is of importance for confirmation of etiology of pleurisy.

5. Define a mechanism of development of pleural inflammatory reaction caused by mycobacteria tuberculosis?

A. Lymphogenic only.

B. Lympho-hematogenic.

C. Sputogenic.

D. Bronchogenic.

E. Hematogenic only.

6. Which kind of exudate has small quantity of free liquid, being quickly organized, producing sheet-anchors?

A. Purulent.

B. Serous.

C. Fibrous and serous-fibrous.

D. Hemorrhagic and serous-hemorrhagic.

E. Serous-purulent.

7. Complication of which form of pulmonary tubercular process can be development perifocal pleurisy?

A. Fibrous-cavernous.

B. Infiltrative

C. Subacute disseminated

D. Chronic disseminated

E. All the forms specified can be complicated by perifocal pleurisy.

8. What measures should be taken on a priority basis in treatment of accumulation of purulent exudates in tuberculosis of pleura?

A. Increase of quantity of antitubercular preparations

B. Repeated aspiration of exudate with formation of negative pressure in the pleural cavity

C. Prescription of corticosteroids

D. Prescription of disintoxication therapy

E. All above-mentioned

9. What complications can follow tubercular empyema?

A. Bronchopleural fistula.

B. Thoracical fistula

C. Amyloidosis of inner organs

D. Pneumopleurisy

E. All mentioned above.

The patterns of answers: 4. E. 5. B 6. C. 7. E. 8. B 9.E

7. The control of final level of the topic mastering

1. A 47-year-old patient complains of weakness, fatigue, loss of appetite, raise of temperature up to 38,5C, blunt pain in the right half of the thoracic cage. Objectively: the patient lies on the right side, respiratory rate 40 per minute, the

right half of the thoracic cage lags behind in respiration. In the middle and bottom third of the right half of the thoracic cage, vocal fremitus is not observed, dullness is defined percussively, respiration is not heard. Above the top border of dullness, pulmonary sound with tympanic shade is heard. For the last half a he has contacted a patient with open form of tuberculosis, initial diagnosis: tuberculosis.

Which form of tuberculosis can display the above-mentioned physical data?

- A. Infiltrative tuberculosis of lungs.
- B. Cirrhotic tuberculosis of lungs.
- C. Exudative pleurisy.
- D. Caseous pneumonia.
- E. Fibrinous pleurisy

2. During a week, a 27-year-old patient complains of the pain in the right half of thoracic cage, subfebrile temperature, weakness, loss of appetite, dyspnea. On the survey X-ray in the right lung homogeneous darkening of high intensity is observed – from III rib up to the dome of diaphragm. The top border of a shadow represents a slanting line, the lower one – runs into the dome of the diaphragm. After carrying out of a pleural puncture and research of the pleural liquid, the diagnosis is: FDTB (22.03.2005) right side pleurisy (exudative), MBT+ M+ C+ Resist I (0), Resist II (0), Hist 0, Cat 1 Cog 1 (2005).

What changes of the pleural liquid will be characteristic for exudative pleurisy tubercular etiology in the patient?

- A. Specific weight 1,012, protein 20g/l, cytois 20 neutrophil, Rivalt's reaction-negative.
- B. Specific weight 1,025, protein 50g/l, cytois 90 neutrophil, Rivalt's reaction -positive, MBT-
- C. Specific weight 1,020, protein 40g/l, cytois 50 neutrophil, Rivalt's reaction-positive, MBT-
- D. Specific density – 1,020, protein 40g/l, cytois 60 lymphocytes, Rivalt's reaction -positive, MBT+
- E. Specific weight 1,020, protein 40g/l, cytois 60 neutrophil, Rivalt's reaction-positive, MBT-

3. A 15-year-old teenager. A week ago felt pain in the right half of thoracic cage, weakness, dyspnea, raise of temperature up to 38,8C. Objectively: intercostal intervals projected from the right side. In the middle and bottom portions of the right lung, voice tremor is absent, percussively – shortening of percussive sound on shoulder-blade and axillary lines, auscultatively – respiration is sharply weakened. On Xray: intensive darkening of the right pulmonary field from III rib up to the diaphragm is observed. Heart shadow is dislocated to the left. When he was 14 years old, revaccination did not spend owing to the infestation. Current Mantoux test with 2 TU PPD-L – infiltrate 22 mm in diameter.

The most likely diagnosis of the teenager is?

- A. Right side exudative pleurisy of tubercular etiology.
- B. Atelectasis of the right lung.
- C. Right side caseous pneumonia.

D. Nonspecific right side exudative pleurisy

E. Right side pleuropneumonia

4. A 34-year-old patient complains of the pain in the right half of thoracic cage during a week, subfebrile temperature, weakness, dyspnea. Objectively: the right half of thoracic cage lags behind in respiration act. On the posterolateral portion of the right lung, below the angle of the shoulder-blade, absence of voice trembling, shortening percussive sound, the weakened breath are marked. The survey roentgenogram shows homogeneous darkening of high intensity in the right lung – from III rib up to the dome of the diaphragm. The top border of the shadow represents a slanting line, lower – runs into the dome of the diaphragm. After carrying out of a pleural puncture and research of the pleural liquid, the diagnosis is: FDTB(12.04.2005) right side pleurisy (exudative), MBT+ M+C+ Resist 0, Resist II (0), Hist 0, Cat 1 Cog 2 (2005). **What therapy should be instituted in the intensive phase?**

A. Isoniasid+Rifampicin+Streptomycin+ Pyrazinamid.

B. Isoniasid+Rifampicin+Pyrazinamid.

C. Isoniasid+ Rifampicin+Streptomycin.

D. Isoniasid+Rifampicin+Ethambutol.

E. Rifampitsin+Streptomycin+Ethambutol+ Pyrazinamid.

5. During a week, a 37-year-old patient complains of weakness, raise of temperature up to 38.5C, pain in the left half of the thoracic cage, dyspnoea. Objectively: the left half of thoracic lags behind in the respiration act. In the posterolateral portion of the left lung, below the angle of the shoulder-blade, absence of vocal tremor, shortening of percussive sound, weakened breath is marked. At the survey roentgenogram: in the left lung, from IV rib up to the diaphragm, massive homogeneous darkening is defined. Heart shadow is dislocated to the right. The tubercular etiology of exudative pleurisy can be diagnosed.

Which research of the patient will confirm the etiology of pleurisy?

A. Bronchoscopy.

B. Roentgenoscopy.

C. Research of the pleural liquid.

D. The biochemical analysis of blood

E. General analysis of blood.

The patterns of answers: 1.C. 2. D. 3.A. 4.A. 5.C.