

## TOPIC OF THE PRACTICAL LESSON № 9:

**Focal and infiltrative tuberculosis. Caseous pneumonia. Cavitary tuberculosis. Fibro-cavernous tuberculosis. Cirrhotic tuberculosis. Tubercular pleurisy (empyema). Diagnosing and treatment of complications of tuberculosis, which need of emergency care: pulmonary hemorrhage, spontaneous pneumothorax.**

Actuality of theme. In 1995, an epidemic of tuberculosis was registered in Ukraine. Timely detection of focal, infiltrative tuberculosis has a positive effect on treatment results, significantly improves the epidemiological situation; late diagnosis, on the contrary, promotes development of destructive and common forms of tuberculosis. Chronic forms of tuberculosis (fibrous - cavernous, cirrhotic) is serious clinical, epidemiological, social problem, because formed gradually over the years and lead to disability most patients. Timely detection of tuberculosis has a positive effect on the frequency and severity of complications increased significantly respiratory tuberculosis. Carrying out anti-tuberculosis chemotherapy significantly prolonged the life of incurable patients with tuberculosis, but also increased the frequency of various complications from the chronicity of the tuberculosis process, which requires adequate therapy and, in some cases, emergency care.

The purpose of the lesson: to teach students on the basis of anamnesis, clinical, radiological and other auxiliary methods of examination to diagnose secondary forms of tuberculosis and prescribe appropriate treatment, the nature of complications of tuberculosis of the respiratory organs and prescribe appropriate treatment.

The student must know:

- pathogenesis of focal, infiltrative tuberculosis, caseous pneumonia, fibro-cavernous, cirrhotic pulmonary tuberculosis and various complications of respiratory tuberculosis;
- clinical picture, course, diagnostic methods, differential diagnosis of focal, infiltrative tuberculosis, caseous pneumonia, tuberculoma, fibro-cavernous, cirrhotic pulmonary tuberculosis and complications (hemoptysis and pulmonary bleeding, spontaneous pneumothorax);
- principles of treatment of focal, infiltrative tuberculosis, caseous pneumonia, tuberculoma, fibro-cavernous, cirrhotic pulmonary tuberculosis various complications of respiratory tuberculosis.

The student must be able to:

- collect a history of the disease;
- examine the patient and identify the main symptoms of the disease;

- detect and interpret pathological changes on chest radiographs, draw up a protocol of X-ray examination;
- evaluate the results of tuberculin tests and other laboratory tests;
- substantiate the clinical diagnosis according to the classification, diagnose complications;
- conduct a differential diagnosis of disease and its complications;
- prescribe treatment to patient;
- provide emergency care to a patient with pulmonary hemorrhage, hemoptysis, spontaneous pneumothorax.

#### Interdisciplinary integration.

| Subject                         | Know   | Be able   |
|---------------------------------|--|---|
| <b>Previous:</b>                |  |   |
| Anatomy                         | The anatomy of the respiratory system.   |   |
| Physiology                      | The physiology of the respiratory system.  |   |
| Microbiology                    | The morphological structure, properties, pathogenicity and virulence of MBT, their methods detection in sputum and others pathological materials.              | To collect material for bacteriological research. To evaluate the results obtained.   |
| Pathological anatomy            | The pathomorphological changes in organs breathing in tuberculosis.  |   |
| Pathological physiology         | Pathophysiology of diseases respiratory system.  |   |
| Pharmacology                    | Classification and mechanisms of action anti-TB drugs.   |   |
| Propaedeutics internal diseases | Methodology of the objective examination of the patient.   | To make objective examination of the patient, evaluate the results obtained.  |
| Radiology                       | The radiological signs and syndromes.  | To interpret data radiological examination.   |
| <b>The following:</b>           |  |   |
| Internal medicine               | Clinical manifestations and radiological picture pneumonia, eosinophilic infiltrate, pulmonary infarction, lung abscess, spontaneous pneumothorax, hemoptysis. | To differentiate from focal, infiltrative tuberculosis, caseous pneumonia, tuberculoma, fibrous - cavernous, cirrhotic TB, non-specific |

|                            |  |   |
|----------------------------|--|---|
|                            |  | complications<br>organ diseases<br>breath.  |
| Oncology                   | Clinical manifestations and radiological picture central and peripheral lung cancer. | Differentiate from focal, infiltrative tuberculosis, caseous pneumonia, tuberculoma, fibrous-cavernous, cirrhotic tuberculosis. |
| Intra-subject integration: | Clinical manifestations and radiological picture other clinical forms tuberculosis.  | Differentiate from focal, infiltrative tuberculosis, caseous pneumonia, tuberculoma, fibrous-cavernous, cirrhotic tuberculosis. |
| Intensive care             | Clinical manifestations, diagnosis pulmonary hemorrhage.                             | To provide urgent help with pulmonary bleeding, hemoptysis.   |

#### Content of the lesson topic:

*Focal pulmonary tuberculosis.* Pathogenesis and pathomorphology. Softfocal and fibro-focal forms. Determination of activity tuberculosis process. Clinic, course, diagnosis, treatment.

*Infiltrative pulmonary tuberculosis.* Pathogenesis and pathomorphology. Clinic, course, diagnostic methods. Clinical and radiological variants infiltrates, lobular, rounded, cloudy, lobite, periscisuritis. Differential diagnosis, treatment, consequences.

*Caseous pneumonia.* Factors contributing to its development. Features course of caseous pneumonia. Differential diagnosis with nonspecific pneumonia.

*Tuberculoma.* Pathogenesis and pathological anatomy. Morphological varieties: homogeneous, infiltrative-pneumonic, layered, conglomerate, “pseudotuberculoma”. Clinic, diagnostic methods. Course: stationary, progressive tuberculomas. Differential diagnosis with echinococcal cyst, peripheral cancer, benign tumors, metastases. Methods of conservative and surgical treatment, consequences.

*Fibrous - cavernous pulmonary tuberculosis.* Pathogenesis of caverns. Building caverns. Radiological signs of the cavity. Ways to heal the cavity. The reasons for the formation of fibro-cavernous pulmonary tuberculosis. Pathogenesis,

pathomorphology, clinical course variants, radiological signs. Differential diagnosis with cysts, abscesses, cavities form of cancer. Complications of fibro-cavernous tuberculosis (non-specific and specific), their prevention, diagnosis and treatment. Treatment of fibro-cavernous tuberculosis. Value drug resistance of MBT, intolerance to anti-TB drugs in long-term chemotherapy. Indications for surgery treatment. Consequences.

*Cirrhotic pulmonary tuberculosis.* Clinical signs, course, treatment. Definition of the terms “pneumosclerosis”, “fibrosis”, “cirrhosis”. Pneumogenic, bronchogenic, pleurogenic cirrhotic tuberculosis. Differential diagnosis with inactive post-tuberculous cirrhosis, post-pneumonic cirrhosis.

Complications of respiratory tuberculosis: respiratory failure, hemoptysis, pulmonary hemorrhage, spontaneous pneumothorax.

Hemoptysis and pulmonary hemorrhage. Pathogenesis (rupture or erosion of blood vessels, increased vascular permeability, granulation damage, hypertension in the system pulmonary artery, disorders of the coagulation system, activation fibrinolysis). Diagnosis. Treatment: conservative (reduction of increased pressure in the pulmonary artery system, activation of blood clot formation, inhibition of fibrinolysis, reduction of vascular wall permeability), endoscopic, surgical. Complications of pulmonary hemorrhage (asphyxia, aspiration pneumonia, atelectasis, hypovolemia, anemia, hypoproteinemia).

#### Physico - biochemical characteristics of transudate and exudates

| Characteristics of effusion                   | Transudate              | Exudate                         |
|---|-------------------------|---------------------------------|
| Transparency                                  | Transparent             | Transparent                     |
| Color   | Pale yellow             | Yellow; yellow-red; red; white  |
| Consistence                                   | Liquid                  | Liquid; creamy, crumb - similar |
| Smell   | No                      | No, sometimes rotten            |
| Specific weight                               | Less than 1015          | More than 1015                  |
| Protein (g/l)                                 | Less than 25-30         | More than 25-30                 |
| Rivalt's test                                 | Negative                | Positive                        |
| Lactate dehydrogenase activity                | <1.6 mmol/(l.h)         | >1.6 mmol/(l.h)                 |
| The content of cells                          | <1 * 10 <sup>9</sup> /l | > 1 * 10 <sup>9</sup> /l        |
| Content ratio in the pleural fluid and serum: |                         |                                 |
| - protein                                     | <0.5                    | >0.5                            |
| - LDH   | <0,6                    | >0,6                            |

#### Indicative map - instructions for mastering the skills of emergency help with hemoptysis and pulmonary hemorrhage.

| Tasks | Instructions for the task | Note |
|-------|---------------------------|------|
|-------|---------------------------|------|

|   |  |   |
|---|--|---|
| 1. Create sick conditions maximum physical and mental calm. | It is necessary to calm the patient, scared actions that occur. Position in the bed should be half-seen since it facilitates coughing sputum and blood clots that accumulated in the airways. If hemoptysis scanty, full physical rest is not required.  | Watch out for intonation their language.  |
| 2. Strict compliance rational therapeutic tactics.          | Given that the main immediate causes of hemoptysis and pulmonary hemorrhage is a rupture of the wall pulmonary blood vessel due hypertension in the small circle of blood circulation (almost 100% of cases), activation fibrinolysis (45%), disturbances in the system blood clotting (30%) and increase permeability of the vessel wall (15%), then in first of all it is necessary to appoint all antispasmodics (euphylline, papaverine, noshpu, atropine), ganglioblockers (pyrilene, benzohezone), in half of the cases inhibitors of fibrinolysis (aminocapronova, amben, contracal), every third- drugs that increase the ability of blood to clot (hemophobin, dicynon, fibrinogen, thromboplastin, thrombin, vikasol) and less drugs to reduce permeability the walls of the pulmonary vessel (gluconate calcium, galascorbin, ascorbic acid, sodium ascorbate). | In cases asphyxia (because of blockages respiratory blood vessels, spilled) resort to suction blood from the trachea catheter, but more effectively drainage bronchi at bronchoscopy or intubation. |
| 3. Immediate surgically help.                               | At inefficiency of medicines means, as well as in conditions that are directly life-threatening the patient is shown surgery, if there are no serious contraindications.   | The main operation is lung resection, much less others operations.  |

Spontaneous pneumothorax. Pathogenesis, clinic, diagnosis. Closed, open, valvular pneumothorax. Medical tactics.

#### 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. 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, describe and interpret radiographs, 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. A 48-year old patient went to the doctor with complaints of weakness, increased fatigue, decreased efficiency. When objective examination of the patient's pathology was not detected. Fluorogram: fibrous on the background altered pulmonary pattern in the apical (S1) segment of the right lung there are low-intensity shadows up to 1 cm with blurred contours. On the basis of which sign the detected fluorographic changes are attributed to focal pulmonary tuberculosis?

- A. Shadows of low intensity.
- B. Shadows have blurred contours.
- C. Shadows are up to 1 cm in size.
- D. Shadows are placed on the background of fibrous altered pulmonary pattern.
- E. Localization of shadows in the upper segment of the right lung.

2. How is focal tuberculosis most often detected?

- A. At clinical inspection.
- B. During the preventive fluorographic examination.
- C. At bacterioscopic inspection.
- D. At bronchological inspection.
- E. At immunological inspection.

3. What cannot be a consequence of infiltrative tuberculosis?

- A. Complete resorption.
- B. Formation of tuberculoma.
- C. Formation of a group of compacted foci.
- D. Fibrous-cavernous tuberculosis.
- E. Tuberculosis of intrathoracic lymph nodes.

4. What criteria are crucial when conducting a differential diagnosis between caseous pneumonia and infiltrative tuberculosis?

- A. Rapid, progressive course of the disease.
- B. The process of localization.
- C. The presence of a decay cavity in the pulmonary part.
- D. The degree of bacterial excretion.
- E. The presence of complications.

5. What radiological syndrome accompanies the presence pulmonary tuberculoma?
- A. Focal shadow syndrome.
  - B. Syndrome of “spherical” formation.
  - C. Restricted blackout syndrome.
  - D. Syndrome of annular enlightenment.
  - E. Syndrome of lung root pathology.
6. From what clinical form of tuberculosis is most often formed tuberculoma?
- A. Disseminated.
  - B. Infiltrative.
  - S. Fibrous-cavernous.
  - D. Cirrhotic.
  - E. Bronchoadenitis.
7. What is the most characteristic course for fibro-cavernous tuberculosis?
- A. Wavy, with periods of remission and exacerbations.
  - B. Acutely progressive.
  - S. Subacute.
  - D. Asymptomatic.
  - E. Rapid reversal.
8. What is most often a specific complication of fibro-cavernous pulmonary tuberculosis?
- A. Tuberculous pleurisy.
  - B. Tuberculosis of the larynx.
  - C. Tuberculosis of the intestine.
  - D. Tuberculosis of the kidneys.
  - E. Tuberculosis of the genitals.
9. What is the main criterion to distinguish cirrhotic tuberculosis from cirrhosis?
- A. The presence of intoxication syndrome.
  - B. The presence of bronchopulmonary syndrome.
  - C. The presence of dry scattered rales.
  - D. The presence of a positive tuberculin reaction.
  - E. The presence of bacterial excretion.
10. Which research method is crucial in the diagnosis of pleurisy any etiology?
- A. X-ray.
  - B. Ultrasound diagnostics.
  - C. Pleural puncture.
  - D. Tuberculin tests.

## E. Bronchoscopy.

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

| Educational tasks   | Instructions for the task   | Answer |
|---|---|--------|
| <b>Examine:</b><br>Focal tuberculosis                       | Pathogenesis. Softfocal and fibrous-focal forms. Clinic, diagnostic methods, differential diagnosis, treatment. |        |
| Infiltrative tuberculosis                                   | Pathogenesis. Clinical and radiological forms. Clinic, diagnostic methods, differential diagnosis, treatment.   |        |
| Caseous pneumonia   | Definition, pathogenesis, clinic, diagnosis, treatment, consequences.   |        |
| Tuberculoma   | Morphological varieties, clinic, course, diagnosis, differential diagnosis, treatment.                          |        |
| Pathogenesis of destructive forms of pulmonary tuberculosis | The concept of the cavern. Stages formation of destructive process. Cavern signs. Cavern involution.            |        |
| Fibrous-cavernous tuberculosis                              | Clinic, course, diagnosis, differential diagnosis, complications. Treatment.                                    |        |
| Cirrhotic tuberculosis                                      | Clinic, course, diagnosis, differential diagnosis. Treatment.   |        |
| Pulmonary hemorrhage  | Definitions, reasons. Clinical manifestations, diagnosis and treatment.   |        |
| Pulmonary hemoptysis  | Definitions, reasons. Clinical manifestations, diagnosis and treatment.   |        |
| Spontaneous pneumothorax                                    | Definition. Pathogenesis, types, diagnosis and treatment.   |        |

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