

"Approved"
**at a meeting of the Department of General
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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 6</i>	Disseminated and miliary tuberculosis. Tuberculosis of the nervous system and meninges. Pathogenesis, pathomorphism, clinic, diagnostics. Peculiarities of diagnostics and treatment in HIV-infected persons. Current treatment regimens according to the spectrum resistance MBT.
<i>Course</i>	4

Topic № 6: Disseminated and miliary tuberculosis. Tuberculosis of the nervous system and meninges. Pathogenesis, pathomorphism, clinic, diagnostics. Peculiarities of diagnostics and treatment in HIV-infected persons. Current treatment regimens according to the spectrum resistance MBT.

Currency of the topic

Disseminative pulmonary tuberculosis in most of cases is regarded as evaluative form, more seldom – as small form of tuberculosis (in case of limited disease without cavitation). The part of disseminative tuberculosis in the total structure of morbidity of tuberculosis is 11-16%. If in some regions the rate of disseminative tuberculosis increases it means that timely detection of tuberculosis in these regions is imperfect.

Disseminative tuberculosis can develop both in primary and secondary periods of the infection. Hematogenous and lymphogenous ways of development of tuberculous infection more often take place in it's primary period in young persons, adolescents and children. Nowadays disseminative tuberculosis became more frequent in elderly persons. Taking into account the increasing of miliary tuberculosis during last years this disease was distinguished in separate clinical form, demanding meticulous approaching to it's diagnosis and treatment. The increasing of frequency of such serious disease as tuberculous meningitis also takes place last years. Tuberculous meningitis means the involvement of soft covers of brain in specific inflammation . It can be accompanied by the involvement of the stuff of the brain, then meningitis and encephalitis can occur. Thus the increasing of frequency of disseminative forms of tuberculosis significantly makes the epidemic situation more worse. That' s why the early detection of disseminative tuberculosis and it's intensive treatment allow to improve epidemic situation in some region.

General goal. To create the conditions for students supplying getting the knowledge and the skills allowing to recognize different variants of disseminative pulmonary tuberculosis, miliary tuberculosis, tuberculosis of nerves system and meninges.

The concrete aims:

1. To generalize the results of the interrogatory of the patients, data of physical examination and investigations and interpret them for concrete form of tuberculosis.

2. To identify the main syndromes in different clinical forms of disseminated, miliary tuberculosis , tuberculosis of nerves system and meninges.

3. To establish the diagnosis of studying clinical forms of tuberculosis on the ground of obtained results of investigations.

4. To formulate clinical diagnosis of disseminated, miliary tuberculosis and tuberculosis of nerves system and meninges.

5. To prescribe complex treatment to patients with different studying forms of secondary tuberculosis.

Basic knowledge and skills are necessary for topic studying

To reach concrete aims of the topic the student must have following knowledge and skills:

1. To be able to carry out the interrogatory of the patient suffering from pulmonary tuberculosis.
2. To be able to carry out physical examination of the organs of the chest: to define it's form, to reveal it's deformation and lagging of one side of the chest during the breathing.
3. To be able to carry out the palpation, the percussion and the auscultation of the chest.
4. To give clinical estimation of obtained data, to define pathogenesis of revealed symptoms.
5. To be able to generalize obtained results.
6. To know the genesis of studying clinical form of tuberculosis.
7. To define concrete clinical syndrome in disseminative and miliary tuberculosis.
8. To define causative organism of tuberculosis, it's types. To describe the main properties of mycobacterium tuberculosis (MBT), to apply methods of detection of MBT.
9. To describe the peculiarities of path morphological changes in the organs in tuberculosis.
10. To classify antituberculous drugs and to use them in the 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 is a disease which develops in the body previously infected by mycobacterium tuberculosis

2.Disseminated tuberculosis Disseminated tuberculosis is a clinical form of tuberculosis characterized by the generation of multiple lesions of different origin with acute, subacute and chronic duration.

3.Miliary tuberculosis Miliary tuberculosis is an acute progressive form of tuberculosis with generalized involvement of different organs manifesting as tuberculous sepsis.

4.Tuberculosis of nerves system and meninges (TB meningitis) Tuberculous meningitis is a specific inflammation of soft covers of the brain or cerebrospinal covers.

Practical tasks which are doing during the class

1. To work out the plan of the talk with a patient suffering from TB reflecting in it the cause of the disease, peculiarities of it's duration, necessity and prolonged course of the treatment, the result of the treatment.

2. Put the questions for the examination of the patient: to analyze general and respiratory complaints, peculiarities of the start of the disease and it's subsequent duration in the concrete patient.

3. To perform the physical examination of tuberculous patient and work out the plan of the examination.

4. To make the diagnosis of tuberculosis indicating the type, localization, clinical form of TB, presence of the destruction, bacilli excretion, drug sensitivity of MBT, result of histological confirmation of the diagnosis, category, cohort, complications on the ground of physical examination and investigations.

Contents of the topic

Secondary tuberculosis develops in the body previously infected by *Mycobacterium tuberculosis*. Clinical manifestations of secondary tuberculosis depend on clinical form. Tuberculosis of nervous system and meninges depends on the localization of the process and period of the disease.

Disseminated pulmonary tuberculosis is a clinical form of tuberculosis characterized by the generation of multiple tuberculous lesions of different origin with acute, subacute and chronic duration. Multiple lesions of dissemination are generated as a result of hematogenous, lymphogenous, bronchogenous and mixed spreading of tuberculous infection. The lesions can be of different correlation between exudative and proliferative components of the inflammation. Disseminative pulmonary tuberculosis in the majority of cases is regarded as evaluative form of tuberculosis, more seldom – as small one. It takes from 11% to 16% in the total structure of morbidity of tuberculosis.

Miliary tuberculosis is an acute progressive form of tuberculosis with generalized involvement of different organs during as tubercular sepsis. miliary tuberculous lesions can appear in the lungs, liver, spleen, meninges, intestine and/or other organs.

In number of cases miliary tuberculosis is limited by only respiratory system. Depending on the prevalence of some clinical syndrome different clinical forms of miliary tuberculosis are distinguished: typhoid, pulmonary and meningeal ones. An execution of x-ray pictures plays an important role in the diagnostics of miliary tuberculosis because x-ray- scope method does not give necessitate information. Fluorography is also not informative enough.

Tuberculous meningitis concerns to extrapulmonary tuberculosis and presents specific inflammation of brain or/and cerebrospinal covers. Specific inflammation of meninges can be accompanied by the affection of the brain – meningoencephalitis. disease has two stage: general hypersensibility caused by TB-infection in lymphatic nodes or other organs develops at first stage, massive bacilliaemia with discharging of the infection through hematoencephalic barrier and infection of the cerebral ventricles, arachnid membrane and ependyma occurs at second stage.

Clinical duration of tuberculous meningitis has three periods: prodromal (period of precursors) period, meningeal (irritation of meninges) period and terminal (period of paralyzes) one. Tuberculous meningitis is differentiated with purulent, serous, viral meningitis and “meningism” – toxic-allergic transient reactions of meninges. The treatment of tuberculous meningitis is a prolonged complex antimycobacterial therapy using at least 5 antituberculosis drugs. Intensive chemotherapy lasts up the normalization of the liquor. Thus, disseminative

processes of tuberculosis etiology are quite severe diseases inclined to repeated exacerbation and seeding of different organs and systems. That's why their treatment can be more prolonged for the prevention of new exacerbation of the disease.

Materials for self-control

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

1. To draw the scheme of pathological changes in lungs in secondary tuberculosis: disseminated TB (acute, subacute, chronic variants), miliary tuberculosis.

2. What is the definition of secondary tuberculosis?

A. Relapse of tuberculosis.

B. Destructive tuberculosis.

C. Tuberculosis which has developed during the long period of time after the infection took place.

D. Tuberculosis with developed clinical picture.

E. Generalized tuberculosis.

The pattern of answer: C.

Tasks for the control of the initial level of the knowledge

1. In which period of TB-infection disseminative tuberculosis can appear?

A. In primary period.

B. In secondary period.

C. In third period.

D. In primary and secondary periods.

E. In secondary and third periods.

2. What character have the lesions of chronic disseminative tuberculosis?

A. They are small ones and have exudative character without a tendency to a fusion and cavitation.

B. They are large and have exudative character with a tendency to a fusion and cavitation.

C. They are small ones and of productive character, indurate and calcified

D. They are polymorph ones.

E. Large calcifications.

3. What character have the lesions of miliary tuberculosis?

A. Small lesions with exudative character without a tendency to a fusion and cavitation.

B. Large lesions with exudative character and a tendency to a fusion and cavitation.

C. Small lesions of productive character, indurate and calcified.

D. Polymorph.

E. Large calcifications.

4. Which method usually helps somebody to detect bacilli excretion in miliary tuberculosis?

A. Microscopy.

B. Microscopy after using the method of flotation.

- C. Culture method.
- D. Biological test.
- E. Usually they are not detected by any method.

5. What character of temperature reaction usually takes place in patient suffering from miliary tuberculosis?

- A. Subfebrile fever during first 3-5 days of the disease.
- B. Prolonged recurrent subfebrile fever.
- C. A fever during first 3-5 days of the disease.
- D. Irregular fever
- E. Normal temperature of the body.

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

The control of final level of the topic mastering

1. The patient of 35 years old. Two years ago he has a pleural exudate. After pleurisy x-ray examination was not done. During last year a cough, breathlessness during physical exertion, periodically fever up to 37,50C troubled him. Now multiple polymeric and polymorph lesions diffused asymmetrically over upper and mediate parts of the lungs on the field of pneumosclerosis are seen in the plane x-ray picture. The roots of the lungs are upward. **For which disease these x-ray changes are characteristic?**

- A. Non-hospital pneumonia.
- B. Idiopathic fibrous alveolitis.
- C. Lung cancer.
- D. Chronic disseminative tuberculosis.
- E. Subacute disseminative tuberculosis.

2. The patient of 35 years old was admitted at the hospital with complaints of the weakness, malaise, cough with the sputum, breathlessness during physical exertion, periodical fever to 37,20C. From past history it is known about frequent chills. Plane x-ray picture: there are asymmetric multiple lesions of different sizes intensity in upper and mediate parts of the lungs. The lung roots are upward. Lower parts of lungs are of increased translucency. Sputum test: MBT (+). Blood test; leukocytes – 10,8x10⁹/l, sticks – 6%, lymphocytes – 25%, ESR – 30 mm/hour. **Which scheme of the treatment must be prescribed in intensive phase?**

- A. Isoniazid + Rifampicin + Streptomycin + Pyrazinamide.
- B. Isoniazid + Rifampicin + Pyrazinamide + Ethambutol.
- C. Isoniazid + Streptomycin + Ethambutol + Pyrazinamide.
- D. Isoniazid + Rifampicin + Streptomycin.
- E. Rifampicin + Streptomycin + Ethambutol + Pyrazinamide.

3. The patient 37 years old during 3,5 months complains of the increased tiredness, subfebrile fever, periodical cough with the sputum, breathlessness during physical exertion, bad appetite. Last x-ray examination was done 3 years ago. Bronchiole breathing and diffused dry rales are heard over the lungs. Plain x-ray picture: there are relatively symmetric multiple lesions of different density and sizes. Lung roots are shifted upward. Lower parts of the lungs are of increased translucency. Blood test: leukocytes – 11,1x10⁹/l, sticks – 4%, lymphocytes –

21%, ESR – 33 mm/hour. MBT in the sputum are not found. **Which clinical form of tuberculosis is diagnosed?**

- A. Chronic disseminative tuberculosis.
- B. Primary tubercular complex (complicated variant)
- C. Subacute disseminative tuberculosis.
- D. Miliary tuberculosis.
- E. Focal tuberculosis.

The patient of 36 years old was admitted at the hospital with severe state. The patient is unconscious. Previously severe headache took place. Now there are vomiting, fever up to 40,00C, significant weakness, dry cough, breathlessness. Physical examination: the patient is in the forced position in the bed, the skin and visible mucous are pale. Pulse is 130 beats per 1 min. The shortening of the sound is heard over the lungs during the percussion. Weakened breathing is heard over the lungs during the auscultation. Neckstiffness is revealed. Kernig's and Brudzinsky's symptoms are slightly positive. Plane x-ray picture: there are multiple small (1-2 mm in the diameter) lesions all over the lung fields. Their contours are vague. Lung markings is almost absent. A previous clinical diagnosis is made: New case of pulmonary tuberculosis (3.09.2008) (miliary), Destr. - , MBT-, K-, Hist. 0, Cat.1, Koh.3(2008). **For what clinical form of miliary tuberculosis such clinical picture is characteristic?**

- A. Acute miliary sepsis.
- B. Meningeal form.
- C. Lung form.
- D. Typhoid form.
- E. Subacute form.

5.The patient at the age of 23 years old was admitted at antituberculosis hospital with the complaints of the fever up to 39,00C, severe headache, vomiting, weakness, chills, vision disturbances. In the past the patient suffered from fibrose-cavernose tuberculosis. Now the patient has squint, diplopy, asymmetry of the face, neckstiffness, Kernig's and Brudzinski's symptoms. Cerebrospinal fluid test: the CSF is transparent, the cytosis is 155/ml (lymphocytes - 60%), proteins – 0,66 g/l, glucose – 2,2 mmol/l, chlorides – 80,0 mol/l, in 24 hours tiny fibrin film appeared, in which MBT were found. The diagnosis is made: tuberculous meningitis. **Which treatment regimen must be prescribed in intensive phase?**

- A. Isoniazid + Rifampicin + Streptomycin + Ethionamide.
- B. Isoniazid + Rifampicin + Streptomycin + Pyrazinamide.
- C. Isoniazid + Rifampicin + Streptomycin + Pyrazinamide + Ethambutol (three times a week).
- D. Isoniazid + Streptomycin + Ethambutol + Pyrazinamide.
- E. Rifampicin + Streptomycin + Ethambutol + Pyrazinamide.

The patterns of answers: 1.D, 2.B, 3.A, 4.E, 5.B.