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**MEDICAL CARD OF TUBERCULOSIS
IN-PATIENT**

Minsk BSMU 2016

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ
КАФЕДРА ФТИЗИОПУЛЬМОНОЛОГИИ

Г. Л. БОРОДИНА, Н. В. ЯЦКЕВИЧ

**ИСТОРИЯ БОЛЕЗНИ ПАЦИЕНТА
С ТУБЕРКУЛЕЗОМ**
**MEDICAL CARD OF TUBERCULOSIS
IN-PATIENT**

Учебно-методическое пособие



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Издание содержит раздел курса фтизиопульмонологии. В нем рассматривается информация, необходимая для составления истории болезни пациента с туберкулезом.

Предназначено для студентов 4-го курса медицинского факультета иностранных учащихся по учебной дисциплине «Фтизиопульмонология», обучающихся на английском языке.

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EDUCATION AIM

The student should be able to:

- collect complaints, history of the disease and the patient's life history;
- implement systematic clinical examination of the patient with pulmonary tuberculosis and some extrapulmonary forms;
- develop tuberculosis patient's examination plan, including those with concomitant somatic pathology;
- identify the main X-ray syndromes, typical for tuberculosis, and execute protocol of radiographic examination;
- assign additional examinations, confirming the diagnosis;
- evaluate the results of bacteriological methods of M. Tuberculosis detection and identification;
- evaluate the results of functional and instrumental methods of examination;
- formulate and justify a clinical diagnosis of tuberculosis;
- conduct differential diagnosis of tuberculosis with non-tuberculous diseases;
- prepare a treatment plan (including surgical procedures);
- assign chemotherapy according to clinical category of the patient;
- identify adverse reactions to anti-TB drugs, prescribe medication and perform their prevention.

Medical card of tuberculosis in-patient should include:

1. Patient's personal data (name, date of birth, address, profession, work place and position).
2. Date of admission to the clinic.
3. Clinical diagnosis and diagnosis of concomitant diseases.
4. Complaints at the time of examination.
5. Patient's life history (Anamnesis vitae).
6. Anamnesis of present disease (Anamnesis morbae).
7. Physical examination data (at the time of examination).
8. Laboratory investigations.
9. Tests for latent tuberculosis infection.
10. X-ray examination.
11. Other investigations: investigations of lung function, bronchoscopy, CT, ECG.
12. Making the diagnosis.
13. Plan of treatment and supervision diary, indications.
14. Prognosis for health and job.
15. Prevention (Evaluation of the degree of hotbed of tubercular infection).

COMPLAINTS AT THE TIME OF EXAMINATION

Although systemic signs and symptoms are classically described to tuberculosis (TB) in medical textbooks, and indeed very important for diagnostic suspicion, it should be kept in mind that they are nonspecific and can be present in other diseases, particularly other bacterial and mycotic bronchopulmonary infections, lung cancer, and chronic diseases with lung involvement.

TB symptoms may progress so slowly over a period of weeks that they are recognized only in retrospect. Some patients may never have obvious symptoms, despite having extensive cavitation. Nonspecific systemic symptoms include progressive onset of fatigue, mild digestive disturbances, malaise, weight loss, anorexia, irregular menses, night sweats, and low-grade fevers lasting for weeks to months. Fevers occur more often in the afternoon or evening and dissipate at night. Less common is an acute onset of spiking temperatures, chills, myalgia, sweating, and weakness in association with parenchymal infiltrates on the chest radiograph; this is usually attributed to a secondary pneumonia or viral illness.

Nonspecific systemic symptoms (intoxication syndrome) include

Fever and sweating

Fever. This can be of any type. There may be only slight rise of temperature in the evening. The temperature may be high or irregular. Often there is no fever. Sometimes, there is marked sweating or profuse sweating (symptom of “wet pillows”).

Weight loss

Anorexia and weight loss are frequent in TB patients (about 70 % of the cases). Weight loss is proportional to the duration and extent of the disease and is frequently accompanied by adynamia.

Weakness, fatigue

Patients complain of weakness, fatigue. The intensity of these complaints depends on the severity, stage and duration of the disease.

Pulmonary complaints (bronchopulmonary and pleural syndromes) include

Cough, sputum

Cough and sputum is very common everywhere. Much of this is due to acute respiratory infections and lasts only a week or two. In many countries there is also much chronic cough due to chronic obstructive pulmonary disease (COPD). This is mostly due to tobacco smoking, but may also occur from atmospheric pollution (either due to cooking or heating fires or in some places to industrial pollution).

The cough may be dry, with a small amount of white, odorless sputum. If bacterial infection develops it may appear purulent sputum.

Cough is present in virtually all patients with pulmonary TB. Cough results from the stimulus caused by the alveolar inflammatory process or from the granulomatous impingement into the respiratory airways. At the onset of the disease, the cough is dry; but with progression, it becomes productive with mucous or mucopurulent expectoration, generally in small amounts, and sometimes with blood. If bacterial infection develops it may appear purulent sputum. Cough is less frequent in the pleural form of the disease. It is worth mentioning that cough tends to be ignored or minimized by smokers, who may have a chronic cough, so questions about changes in the usual pattern can be of great value in increasing suspicion of pulmonary TB.

Hemoptysis

When hemoptysis occurs, the blood volume is variable, from bloody streaks mixed in the sputum (hemoptoic sputum) to massive hemoptysis (more than 400 ml/day), which is rare. A higher volume of hemoptysis is generally caused by erosion of Rasmussen's aneurysms, which are free terminations of arteries within lung cavities. Bleeding can also occur in small lesions during the formation of the cavities, when hemoptysis can be the first manifestation of the disease, which was known by the old phthysiologists as alert hemoptysis or bark.

Dyspnea

Although the inflammatory process of TB causes global parenchyma destruction of both alveoli and blood vessels, there is no gross alteration in the ventilation/perfusion ratio, except in cases of atelectasis, large cavities or lesions with a large acute inflammatory infiltration. Therefore, dyspnea is not a common symptom, but can be caused by pleural effusions, pneumothorax or restriction caused by fibrosis in advanced disease. Dyspnea may be more frequent in the miliary form, due to diffuse interstitial disease and consequent hypoxemia. An obstructive pattern of airway disease can result from the bronchial hyperresponsivity that often accompanies TB.

Thoracic pain

Thoracic pain occurs when there is pleural involvement, but as the TB pathological process begins in the alveoli, very close to the pleural surface, this is an early and relatively frequent symptom. Generally of low intensity, it disappears within two or three weeks after effective treatment has begun.

Hoarseness

This occurs when the larynx is affected, which is frequent with pulmonary TB. It rarely occurs in other forms of the disease. When cough and other symptoms are overlooked by the patient, hoarseness may be the sole reason for seeking medical assistance.

PATIENT'S LIFE HISTORY (ANAMNESIS VITAE)

Patient's life history is described according to the therapeutic clinic scheme, highlighting: whether there was contact with TB patients, frequency of screening for tuberculosis working and living conditions, professional, educational and social status, life still, pernicious habits (tobacco smoking, drug using, alcoholism).

It is important to indicate living conditions (private home, apartment, hostel; how many bedrooms are at home and the existence of a patient's separate room) and family composition (with indication of the age and quantity of children and existence of pregnant women).

It is necessary to collect and analyze information about a patient's life in order to find out the cause of the disease and possible connection of the disease with adverse conditions of a patient's life.

The medical history is important in the patient suspected of having TB. The interview is done to determine whether (1) the patient has been exposed to TB, (2) the patient has risk factors for TB reactivation, and (3) symptoms are consistent with TB.

A careful history of the patient suspected of having TB must include travel of close family or friends who might be infected with TB. Other factors to identify are country of origin, immunosuppression, institutionalized care, and previous or current treatment for TB. Exposure of the patient to a person with active TB is extremely helpful to document, especially if this contact has been significantly close. TB is a chronic disease with an insidious onset. It may not be recognized as a serious illness by either the patient or the physician. The attending physician must document clues in the patient's medical history that are suggestive of TB, such as pleurisy with pleural effusion or a past diagnosis of prolonged pneumonia, such as chronic fevers, night sweats, weight loss, fatigue, cough, sputum, hemoptysis, or dyspnea.

History of associated illnesses should also be documented, such as gastric and duodenal ulcers, uncontrolled diabetes, alcoholism, COPD, malnutrition due to a variety of causes, immunosuppression (especially human immunodeficiency virus (HIV)), or occupational exposure to quartz dust or silica. It is important to note treatment with corticosteroids, cytostatics or radial therapy, post-tuberculosis residual changes and postpartum period in women, recent nursing home admission, incarceration, or institutional care.

ANAMNESIS OF PRESENT DISEASE (ANAMNESIS MORBAE)

The way of tuberculosis detection should be specified: is TB revealed during preventive examination (screening) or in the presence of complaints and applying for medical care. The first symptoms, the date of their onset and

revealing should be analyzed. Previous treatment (before admission in clinic) and its efficacy should be given. Methods of diagnostics, their results, the result of previous chest X-ray should be mentioned in this chapter.

PHYSICAL EXAMINATION DATA (AT THE TIME OF EXAMINATION)

The evaluation of patient with tuberculosis includes all the points of a routine examination of a person with any respiratory disease.

General state of patient, temperature, height, body weight, respiratory system examined and described in detail (inspection, palpation, percussion, auscultation) according to the faculty therapy clinic's scheme. Examination of other organs and systems is performed according to the standard procedure, but the depth of investigations must depend on the presence of comorbidities and complications in chronic forms of tuberculosis and other data. If there is no pathology other systems are described briefly.

Physical examination findings in the patient with TB are not specific enough to make the diagnosis. Physical examination can, however, help determine the extent of the progression of the disease, and whether other areas of the body outside the chest are involved.

Vital signs are not initially suggestive of TB unless the infection is severe enough to produce changes in heart rate, respiratory rate, blood pressure, or body temperature. The pulmonary lesions associated with TB usually give rise to varying degrees of impaired resonance to percussion, bronchial breath sounds, and coarse crackles. Endobronchial disease or bronchial compression by lymph nodes (more common in children) may produce localized wheezing, which can be accentuated by forced expiration while the patient assumes different positions. The trachea may be deviated if the upper lobes have undergone loss in volume. Evidence of extrapulmonary TB in other areas of the body (e. g., spine tenderness, swollen lymph nodes, joint tenderness, enlarged abdominal organs including the liver and spleen) should also be documented. Changes in skin color or blood pressure due to adrenocortical involvement may be present. Digital clubbing and hypertrophic osteoarthropathy are rare findings of TB. A pleural effusion, whether or not it is associated with TB, is characterized by decreased resonance to percussion and absence of breath sounds over the affected region as well as diminished transmission of spoken or whispered sounds. The size of the effusion determines the degree of underlying lung compression and subsequent lung dysfunction.

Physical signs in TB are related to the extent of the lesions, the duration of the disease and the form of TB. The longer the duration of the disease, the more evident are the classic signs of consumption, such as pallor and weight loss. The extent and the form of the disease in the lung parenchyma determine the presence of specific pulmonary signs.

The most common auscultation findings are:

- coarse crackles in the area of the lesion (generally apical and posterior);
- wheezing and rhonchi in the area of compromised bronchi;
- decreased vesicular murmur and bronchophony or tubular blow when pleural effusion is present;
- as well as the classic amphoric breath sounds near cavities.

Hepatosplenomegaly can occur in the disseminated forms.

Some findings are caused by delayed-type hypersensitivity to tubercle bacilli components, although the lesions themselves do not contain *M. tuberculosis* (MBT).

These TB associated conditions are:

- erythema nodosum (inflammation of the subcutaneous adipose tissue);
- phlyctenular conjunctivitis;
- erythema induratum of Bazin (nodular vasculitis);
- polyserositis.

These lesions are mostly associated with primary TB infection.

One of the most important signs, which should make to think of possible tuberculosis, is that the symptoms have come on gradually over weeks or months. This applies particularly to the general symptoms of illness: loss of weight, loss of appetite, tiredness or fever.

LABORATORY INVESTIGATIONS

Assessment of changes in the peripheral and biochemical analysis of blood, urine test at the time of examination should be given.

The microbiology laboratory provides the basis for TB diagnosis, but routine laboratory data are minimally helpful in the absence of any other underlying infections. The white blood cell (WBC) count is usually normal in primary pulmonary TB. A WBC count greater than 15 to 20×10^3 /mL is generally suggestive of another type of infection except in cases of millitary TB (TB dissemination into the blood), which can result in significant leukocytosis. A mild anemia may be seen in chronic TB. The following laboratory data may be increased with TB, yet are considered nonspecific because other problems can also make them abnormal:

- Increase of immature WBCs (left shift) as the TB spreads.
- Elevated erythrocyte sedimentation rate.

SPUTUM INVESTIGATIONS

All methods and all tests of sputum examination for MBT detection and identification (and sensitivity tests of MBT sensitivity to antituberculosis drugs) should be mentioned and analyzed. It should be specified what kind of

material was used, method of investigation, the date of taking the material, the date of receipt of the result, the result of the test.

Numerous nontuberculous strains of Mycobacteria can show up on acid-fast bacilli (AFB) smears. Therefore, a culture of *M. tuberculosis* is a necessary test to confirm TB; unfortunately, these cultures take up to 6 weeks to complete. New innovations to circumvent this problem include “Bactec MGIT” (the use of liquid media Middlebrook), DNA probe, polymerase chain reaction assay (from sputum).

An early morning collection of expectorated sputum is best for laboratory evaluation by stain and culture. If the patient is unable to produce a sputum sample, a sputum induction can be done to collect the specimen (induced sputum). The health-care worker must be protected from exposure to TB during sputum collection and subsequent treatment of the patient.

Whenever TB is suspected, universal precautions should be augmented by techniques to prevent micron size droplet inhalation to protect against potentially contaminated, aerosolized fluid. Aerosolized hypertonic saline is administered for 15 to 20 minutes to stimulate the patient to cough and produce sputum. Saline helps the patient produce sputum by providing moisture and stimulation of expectoration.

TB patients often swallow their sputum during sleep; thus, in some cases where the patient is unable to expectorate sputum, a gastric aspirate culture is helpful. A sample of stomach contents is aspirated in the early morning before the patient arises. The use of a gastric aspirate smear has value in children.

TESTS FOR LATENT TUBERCULOSIS INFECTION

Current and previous (if it is possible) results of the different tests for latent tuberculosis infection should be indicated (tuberculin skin test, Diaskintest and QuantiFERON-TB Gold In-Tube Test).

CHEST RADIOGRAPH

Posterior-anterior and lateral chest films show the extent of pulmonary involvement and location of the disease. Together with bacteriologic examinations of sputum and positive tests for latent tuberculosis infection (especially in children), the chest radiograph provides a valuable tool in the diagnosis of TB. Reactivation TB usually causes infiltrates in the apical-posterior segments of the upper lobes. In contrast, the most common abnormality on the chest radiograph of the patient with primary TB is hilar lymph node enlargement.

In tuberculosis, a wide variety of abnormalities may be present on the same film. In films taken at least 2 weeks apart, changes in the abnormalities can be detected: growth of the cavities, confluence and spread of the

nodules, or the formation of a cavity inside a patchy shadow. This kind of evolution of the radiographic features suggests that the tuberculosis is clinically active.

When the tuberculosis has progressed over several months, the destruction of the lung parenchyma and gradual fibrosis lead to retraction of the neighboring structures: the trachea may be displaced, the hilum may become elevated, the diaphragm may be pulled upward and the heart's shadow may change shape and place.

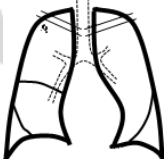

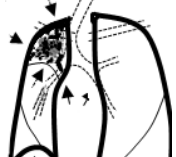


Lesions due to tuberculosis can be unilateral or bilateral; they are most frequently observed in the upper zones of the radiograph (1st, 2nd, 6^d segments). The extent of the abnormalities may vary from a minimal lesion (an area less than the size of a single intercostal space), to far advanced lesions, with extensive involvement of both lungs.

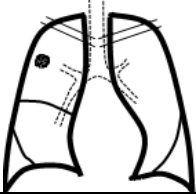
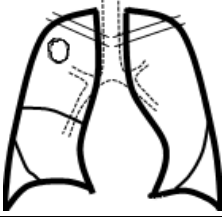
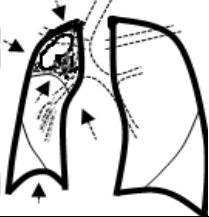



Basic X-ray syndromes in pulmonary tuberculosis:

- Focus (focal shadow) — less than 12 mm of size;
- Shadow (infiltration) — more than 12 mm of size (patchy or lobar shadow);
- Round shadow (shadow of rounded form with clear precise contour);
- Ring-like shadow (cavity);
- Lung dissemination (a lot of foci, which can't calculate);
- Mediastinal lymphadenopathy (hilar lymph node enlargement).

Table 1

Radiographic signs of the main tuberculosis clinical forms

| X-ray appearance | Non-chronic forms (subacute and acute) | Chronic forms* |
|------------------|--|--|
| Focus | <p style="text-align: center;">Focal</p>  | — |
| Patchy shadow | <p style="text-align: center;">Infiltrative</p>  | <p style="text-align: center;">Cirrhotic</p>  |
| Lobar shadow | <p style="text-align: center;">Caseous pneumonia</p>  |  |

| X-ray appearance | Non-chronic forms (subacute and acute) | | Chronic forms* |
|---------------------------|--|--|--|
| Round shadow | <p style="text-align: center;">Tuberculoma</p>  | | |
| Ring-like shadow (cavity) | <p style="text-align: center;">Cavernous</p>  | | <p style="text-align: center;">Fibrotic-cavernous</p>  |
| Dissemination | Total monomorphic dissemination of low density, 2–3 mm, without confluence and cavitation | <p style="text-align: center;">Miliary</p>  | <p style="text-align: center;">Chronic disseminated</p>  |
| | Upper and middle areas, polymorphic dissemination of low/ medium and high density, 5–10 mm, with confluence and cavitation | <p style="text-align: center;">Subacute disseminated</p>  | |

* Volume decreasing affected area, shifting trachea, hilum, mediastinum and diaphragm to the affected side, linear shadow structure due to fibrosis.

In order to describe the radiographic abnormalities in the lungs it is convenient to use the consecutive order:

1. Localization of process. Specify: distribution on lobes and segments.
2. Number, quantity of shadows. Specify: individual (single) or multiple.
3. Form. Specify: rounded, oval, polygonal, linear and irregular.
4. The size of a shadow. Specify: fine, average, and large.
5. The intensity. Specify: weak, average and high.
6. The structure of a shadow (homogeneous or non-homogenous).
7. The contours. Specify: precise or indistinct (dim).
8. Displacement. Specify: a position deviation of lung structures from a normal arrangement.
9. Condition of surrounding lung tissue.

Analysis of X-ray film should be given according to the following plan:

1. Identification of the main X-ray syndrome.
2. Drawing of the X-ray film.
3. X-ray film description.
4. Conclusion with the preliminary diagnosis.

Example of X-ray film analysis

Chest Radiograph protocol DD.MM.YYYY.

The main X-ray syndrome is patchy shadow (figure).

Description. In the upper lobe (1st and 2nd segments) of the right lung is determined a single shadow with irregular form of 30 mm in diameter, average intensity, nonhomogenous (disintegration in the center), with dim contour and the path to the root. In the surrounding lung tissue is enhance bronchopulmonary pattern. The heart, mediastinum are not changed. The contours of the diaphragm are clear, sinuses are free.

Conclusion: it can be assumed (or X-ray picture corresponds to) infiltrative tuberculosis of the right lung upper lobe in the phase of disintegration.

OTHER INVESTIGATIONS

Investigations of lung function test, bronchoscopy, computer tomography (CT), electrocardiogram (ECG) can be mentioned. Only conclusions of these investigations should be indicated (if result abnormal) in medical card.

For example: reduced functional ability of the lungs (restrictive type) or tachycardia or catarrhal endobronhitis in bronchoscopy.

Making the diagnosis: data from all chapters, which confirm the diagnosis of TB, should be presented.

Example of making diagnosis

On the basis of:

- complaints (for example: weakness, cough with small amounts of sputum etc.);
- anamnesis vitae (for example: contact with tuberculosis patient and smoking cessation 20 cigarettes a day for 20 years etc);
- anamnesis of present disease (morbi): (for example: X-ray changes during preventive examination: parenchymal infiltration in the left lung. Nonspecific antibacterial treatment was prescribed. After this treatment radiographic dynamic was not found);
- microbiological investigations. Each positive test should be described: what kind of material was used, method of investigation, the date of taking the material, the date of receipt of the result, the result of the test;

– drug sensitivity test of *M. tuberculosis* to antituberculosis drugs should be specified: what kind of material was used, method of investigation, the date of taking the material, the date of receipt of the result, the result of the test.

Chest Radiograph protocol DD.MM.YYYY (for example: Typical for tuberculosis X-ray syndrome of infiltrative shadow was founded (average intensity, nonhomogenous shadow with dim contour and the path to the root). Localization of the shadow is typical for tuberculosis too (in the upper lobe (1st and 2nd segments) of the right lung).

Diagnosis was made: infiltrative tuberculosis of the right lung upper lobe in the phase of disintegration, MTB «+», MDR (H, R etc), respiratory insufficiency (RI) (0).

Plan of treatment and supervision diary, indications:

1. Regime.
 2. Diet.
 3. Chemotherapy (patient's category, regime, scheme, phase, duration).
 4. Pathogenetic treatment.
 5. Surgical treatment.
- Supervision diary should be given.
Drug prescriptions should be specified.

Prevention

The degree of hotbed of tubercular infection danger, category of the index patients and should be evaluated.

A particular combination of the degree of index patient epidemiological risk, the presence and number of persons who were in close (household and non-household) contact with the index patient, presence and severity of risk factors of contact determines the degree of TB hotbeds epidemiological risk, volume and priority of health measures in the TB hotbeds.

Index case (patient) — patient with active pulmonary new or recurrent TB in a person of any age in a specific household or other comparable setting in which others (contacts) may have been exposed TB infection.

Groups of the index patients:

1. Index patients with active pulmonary TB with cavity, sputum-smear positive, do not treated with antituberculosis drugs.
2. Index patients with active pulmonary TB, only sputum culture positive and/or sputum rapid molecular test, such as the Xpert MTB/RIF test (Cepheid, Sunnyvale, CA) positive.
3. Index patients with active pulmonary TB, sputum-smear, culture, rapid molecular test negative.
4. Index patients with active pulmonary multiple drug resistant TB (MDR-TB) and extensively drug resistant TB (XDR-TB).

Epidemiological danger of MDR-TB and XDR-TB exist due to the duration of the disease and the potential role of transmission MDR-TB and XDR-TB to adults and children who are contacts.

5. Index patients who have HIV infection.

PROGNOSIS FOR HEALTH AND JOB

Example. The prognosis for health and job is good in the case of adherence to treatment or the prognosis for health and job is doubtful, given the multiple drug resistance and lack of adherence to treatment.

РЕПОЗИТОРИЙ БГМУ

Example of the title page

Education institution
«Belorussian state medical university
Phthisiopulmonology department
Chairwoman of the Phthisiopulmonology
department H. L. Baradzina

Medical card of tuberculosis in-patient

Patient's name _____

Clinical diagnosis _____

Diagnosis of concomitant diseases _____

Student's name _____

_____ year _____ group

Lecturer's name _____

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**ИСТОРИЯ БОЛЕЗНИ ПАЦИЕНТА
С ТУБЕРКУЛЕЗОМ**

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IN-PATIENT**

Учебно-методическое пособие

На английском языке

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