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CURRENT STATE OF DIAGNOSTICS OF PULMONARY TUBERCULOSIS

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Abstract
Analysis of literature data indicates the presence of persistent difficulties in the differential diagnosis of pulmonary tuberculosis. The incidence of discrepancies between the primary and established diagnoses in pulmonary tuberculosis, malignant neoplasms of the lungs, pneumonia and sarcoidosis of the respiratory organs ranges from 16.7% to 97.1% [42; 47; 58].
In addition to the fact of establishing an accurate diagnosis for any disease, the timing of its verification also plays a significant role in the prognosis [12].

Keywords: Tuberculosis, diagnostics, differential diagnostics, errors of diagnostics.

Introduction

In phthisiopulmonology, insufficient attention is paid to the analysis of the duration and quality of the diagnostic period at its various stages in patients with lung diseases and hyperdiagnosis of tuberculosis in patients with non-tuberculous diseases.
However, in recent years, new molecular genetic (GeneXpert MTB/RIF test) and immunological (Diaskindest skin test and in cell test) tests have found application in the diagnosis of tuberculosis. vitro QuantiFERON®TB Gold) methods [30]. However, the effectiveness of the above-mentioned tests in the differential diagnosis of pulmonary tuberculosis, community-acquired pneumonia, malignant neoplasms of the lungs and sarcoidosis of the respiratory organs has not been sufficiently studied.
Early diagnosis of pulmonary tuberculosis (TB) and respiratory diseases is an essential component of the practical activities of doctors of many specialties, due to their prevalence, social and economic significance [33].
Tuberculosis continues to be one of the most significant health problems, both worldwide and in the Russian Federation [28].
Despite the intensive development of tuberculosis care, the development and implementation of new diagnostic methods and effective treatments, the incidence of tuberculosis remains high. In 2014 , according to WHO estimates, 9.0 million people fell ill with TB and 1.5 million died from this disease [32].
At present, the incidence rate in the Russian Federation remains at a consistently high level and averaged 59.5 people per 100,000 population in 2014. And, although in recent years there has been some downward trend in mortality from tuberculosis, this figure significantly exceeds the global level and amounts to 10.0 people per 100,000 population in 2014. In the overall structure of mortality from infectious diseases in the Russian Federation, tuberculosis ranks first [14].

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In the Siberian Federal District (SFD), the tuberculosis epidemic situation also remains unfavorable. The incidence rate of newly diagnosed tuberculosis in 2014 in the SFD was -98.8 cases per 100,000 population (in 2013 - 104.8, 2012 - 109.3). In the Novosibirsk Region (NSO), this figure in 2014 was 106.3 cases per 100,000 population [16].

The mortality rate from tuberculosis among the population of the Novosibirsk Region was 20.4 per 100,000 population, which is 2 times higher than the Russian average (10.0 per 100,000) [16]. Therefore, timely detection of patients with respiratory tuberculosis is an essential condition for reliable control of the spread of tuberculosis infection among the population, successful treatment of patients and reduction of mortality from it [24; 35].

Similar clinical and radiological picture of lung diseases of specific and non-specific nature, pathomorphism of tuberculosis and non-specific lung diseases, limited possibilities of using invasive methods of examining patients in outpatient settings lead to diagnostic errors and create preconditions for both hyper- and hypodiagnosis of tuberculosis [40].

Many authors note that untimely detection of both tuberculosis and syndrome -similar lung diseases may be due to both the patient's late seeking of medical care and shortcomings in the organization of medical care and medical errors in the process of verifying the diagnosis.

Errors in differential diagnosis of respiratory diseases are quite common. Among the detected competing pulmonary pathologies, a high percentage is made up of infiltrative, disseminated pulmonary tuberculosis, oncological diseases , sarcoidosis of the respiratory organs and community-acquired pneumonia. The frequency of cases of diagnostic discrepancies in these lung diseases ranges from 16.7% to 97.1%, and the diagnostic period in patients with infiltrative processes in the lungs lasts 2-3 weeks in 20% of cases, and more than 1-3 months in 80%.

Establishing the stage of diagnostic problems and identifying their causes are extremely important for the development of tuberculosis control programs and the improvement of infection control strategies [27; 30]. In addition, increasing the period of diagnostic measures for TB has enormous significance in terms of financial consequences for patients, their relatives and the health care system as a whole [19; 23].

Atypical clinical and radiological manifestations of the disease in some cases, clinical and radiological picture, absence of mycobacteria tuberculosis in sputum, normergic and even negative tuberculin tests lead to difficulties in diagnosing tuberculosis. Based on these data, it is quite difficult to conduct differential diagnostics within the diseases: cancer, tuberculosis, pneumonia, sarcoidosis [24; 36].

Such manifestations of pulmonary tuberculosis as cough, hemoptysis, shortness of breath, weight loss, increased body temperature, general weakness, increased sweating, chest pain are nonspecific and characteristic of other diseases of the bronchopulmonary system - COPD, bronchial asthma, interstitial lung diseases, pneumonia, lung oncopathology , etc. and can also be caused by extrapulmonary pathology [20].

Concomitant diseases that are pathogenetically closely associated with tuberculosis (HIV infection, alcoholism, COPD, diabetes mellitus, oncological pathology, drug addiction, etc.), on the one hand, are risk factors for the development of tuberculosis, and on the other hand, they mask its manifestations and complicate diagnosis [28].

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In the structure of tuberculosis of the respiratory organs, the main form for many years has been infiltrative pulmonary tuberculosis and occurs in 70-80% of patients [26; 36].

Manifestations of infiltrative pulmonary tuberculosis may be similar to clinical and/or radiological signs of pneumonia. Polymorphism of clinical and radiological manifestations, insufficient clinical alertness and low efficiency of traditional methods studies constitute the main difficulties in diagnosing the disseminated form of pulmonary tuberculosis [8; 43; 49; 54].

In analyzing errors in the diagnosis of disseminated pulmonary tuberculosis, I. Yu. Babaeva (2001) showed that in 50.7% of cases, patients with tuberculosis were given a clinical diagnosis of community-acquired pneumonia. In cases of predominantly lymphogenous dissemination, extrapulmonary diseases (21.1%), pneumonia (30.9%), sarcoidosis (19.7%), and cancer (12.6%) were diagnosed. In disseminated tuberculosis with broncholobular caseous pneumonia, a diagnosis of nonspecific pneumonia was mainly established (68.9%). In her study, the author points to late diagnosis of tuberculosis in 84.7% of cases. 63.5% of patients repeatedly consulted doctors of various specialties or were hospitalized in general hospitals, and 19.5% were consulted by phthisiatricians [8].

Demikhova et al . (2012) point out the continuing difficulties in differential diagnosis of disseminated pulmonary tuberculosis and recommend performing FBS with biopsy. According to the author, the duration of treatment for tuberculosis in patients with non-specific diseases ranged from 2 weeks to 5 years [43].

Often, the manifestations of pulmonary tuberculosis do not always fit into the classical forms of the course of this disease and contribute to a delay in the verification of the diagnosis [23; 34]. Thus, it is important for doctors to be aware of the rare manifestations of tuberculosis in order to avoid diagnostic errors [12].

According to literary sources, the average duration of the diagnostic period for pulmonary tuberculosis is 2-4 months or more, and during the specified period, patients are treated for another suspected disease [10].

A study conducted by O. V. Demikhova (2007) showed a significant percentage (16.7% - 33.4%) of discrepancies between preliminary and final diagnoses in the diagnosis of pulmonary tuberculosis, pneumonia, sarcoidosis and lung cancer. In this work, the author indicates that among the reasons for erroneous diagnoses at the pre-hospital stage, the most common were incomplete and unqualified collection of anamnesis, insufficient volume of research (a single sputum test for MBT was performed only in 46.3%, three times - was absent), incorrect interpretation of the clinical and radiological picture of the disease [42].

According to S. Yu. Posazhennikova (2016), the frequency of discrepancy between the primary and established diagnoses in infiltrative pulmonary tuberculosis was recorded in 41.7% of cases, in community-acquired pneumonia - 63.4%; in oncological lung disease, exogenous allergic alveolitis and sarcoidosis of the respiratory organs, the frequency of discrepancy between diagnoses was 97.1%, 96.0% and 71.4%, respectively [16].

Late diagnosis of pulmonary TB has been studied in high- and low-income countries. The duration of the diagnostic period in patients with pulmonary tuberculosis ranges from 8 to 26 weeks according to foreign researchers.

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While there are standards for differential diagnostics of pulmonary tuberculosis in phthisiopulmonology, computer differential diagnostic programs based on statistical analysis of socio-demographic, anamnestic, clinical, laboratory and radiological predictors of tuberculosis, community-acquired pneumonia, malignant neoplasms of the lungs and sarcoidosis of the respiratory organs can be of significant help.

All of the above indicates the relevance of the problem of improving the differential diagnosis of pulmonary tuberculosis, taking into account factors associated with the timing of diagnosis verification and the introduction of modern highly informative diagnostic technologies, which determined the purpose and objectives of this study.

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