MODERN PATHOGENETIC FEATURES OF THE COURSE AND CLINICAL AND LABORATORY METHODS FOR ASSESSING VARIANTS OF THE COURSE OF PRIMARY TUBERCULOSIS IN CHILDREN AND ADOLESCENTS

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Relevance: In the context of political changes, socio-economic instability and increased population migration due to local conflicts, the proportion of chronic processes that have the status of socially significant diseases is increasing. One of these diseases is tuberculosis.

Keywords: tuberculosis, resistance, organism, children, adolescents;

Although the sequence of events in the course of chronic specific inflammation has long been established, the centuries-old history of tuberculosis and more than half a century of history of the use of anti-tuberculosis drugs have changed the virulence of tuberculosis infection, the general and specific resistance of the body, the structure and course of primary forms of tuberculosis. Due to the fact that primary tuberculosis develops mainly in children, its course is determined by the peculiarities of the development of the child's body at different age periods [11,12,13,14].

In children, the most common aerogenic infection with tuberculosis is due to age-related anatomical and physiological characteristics. An objective reflection of the incidence of tuberculosis in children and adolescents is the prevalence of active forms of primary tuberculosis. The gold standard for diagnosing tuberculosis is the detection of Mycobacterium tuberculosis in various biological materials [4,5,6,10]. Due to the fact that primary tuberculosis is extremely rarely accompanied by bacilli excretion, and its small local forms often have a subclinical course, the possibility of verifying the diagnosis is complicated.

Diagnosis of abacillary tuberculosis traditionally consists of comparing the clinical and radiological picture characteristic of tuberculosis with the results of tuberculin diagnostics and epidemiological data. The activity of the tuberculosis process is the main criterion for deciding questions about chemotherapy and establishing its duration. When determining the activity of the process, along with the above criteria, laboratory data, in particular, indicators of the blood system, reflecting

the body's response to infection, which is determined not only by the relationship of the microbe with the host body, but also by the anatomical, physiological and immunobiological characteristics of the macroorganism in various periods of postnatal life, acquire special significance. ontogeny [1,2,5].

Today, there are standards for laboratory examination of children and adolescents with tuberculosis, which, however, are not fully adapted to assess the nature of the tuberculosis process, taking into account the age characteristics of the patient. There is no pathogenetically substantiated list of the most significant hematological and biochemical criteria that allow, taking into account the age-related characteristics of the child's body and the variant of chronic specific inflammation, to judge the severity of the tuberculosis process, the dynamics of the decrease in its activity during therapy and the advisability of moving from the intensive stage of treatment to the after-treatment stage. The above allows us to consider it relevant to study the age-related patterns of response of the blood system in children and adolescents with various forms of primary tuberculosis [17,18,19].

An insufficient amount of surfactant creates conditions for the development of specific and nonspecific changes in the lungs. Resistance mechanisms in newborns are in a state of natural or physiological failure. They have a significant defect in both cellular and humoral defense mechanisms. Leukocytes of newborns and infants have low phagocytic activity, while the migration of mononuclear cells and leukocytes is slowed down and reduced.

Children and adolescents are an age category that requires special attention during the period of increasing incidence of tuberculosis. A significant deterioration in the epidemiological situation, clinical polymorphism of tuberculosis in children, manifested both asymptomatically and with a pronounced picture with extensive destructive changes, low frequency of bacterial excretion require improvement of methods for diagnosing tuberculosis in children [8, 11,12,13,14,15,16].

Currently, there are a large number of different methods for laboratory diagnosis of tuberculosis, which to one degree or another reflect the characteristics of the pathological process. General clinical, biochemical, immunological, bacteriological studies provide the clinician with the most accurate and reliable information about the state of the internal environment of the patient's body and the course of vital processes, help to adequately judge the presence or absence of a pathological condition, its dynamic changes, and the effectiveness of treatment. In children with active primary tuberculosis, a significant increase in globulins was noted (due to an increase in (3- and γ-fractions), a decrease in osglobulins and albumins, an increase in haptoglobin [4].

For exacerbation of the tuberculosis process, only changes in the proteinogram are characteristic: a decrease in albumin fractions and increased globulin levels. Children at an early age have a physiological weakening of the biosynthesis of u-

globulins, and the synthesis of a- and P-globulins is higher than in an older child. Therefore, an infant usually reacts to any infectious process with an increase in a- and p-fractions. With significant intoxication in such children, the concentration of albumin and globulins increases. In this regard, the ratio of albumins to globulins does not change [4, 11].

Particular attention in phthisiatric practice is paid to the proteins of the acute phase of inflammation - ceruloplasmin and haptoglobin. These proteins are involved in the transport and utilization of copper, neuroendocrine regulation, hematopoiesis, and the formation of nonspecific resistance of the body. Many researchers [12, 13,14,15] have found that the levels of ceruloplasmin and haptoglobin increase significantly in tuberculosis. The clinical course of tuberculosis during the period of antibacterial therapy has its own characteristics. This requires objectification of the assessment of the degree of activity of a specific process, the state of metabolic changes in the body during chemotherapy.

To date, the damaging effects of both the tuberculosis process itself and tuberculostatic drugs on the liver, central and peripheral nervous system, energy, protein and carbohydrate metabolism have been studied in detail. Both in children and adults with tuberculosis, before the start of antibacterial therapy, functional and morphological changes in the liver, caused by tuberculosis intoxication itself, can be detected [7,8,9]. During the persistence of tuberculosis infection in the body, morphological changes (both specific and nonspecific) are observed in the kidneys. As you know, the kidneys bear the main burden of eliminating drugs during chemotherapy. With primary tuberculosis, pathological changes in the urine are detected in 28.4% of patients. They are more often observed in children with s evere forms of tuberculosis and severe intoxication [2,3,4,5,6]. The most commonly detected leukocyturia and proteinuria, less often - hematuria and cylindruria, which are based on increased vascular permeability of the microvasculature, caused by immunological mechanisms in response to infection.

With the development of allergic reactions to anti-tuberculosis drugs, the kidneys are involved in the pathological process in the majority of sick children [2,6]. The degree of manifestation of such changes increases with increasing treatment duration. Therefore, during therapy with tuberculostatic drugs, dynamic monitoring of the functional state of the kidneys and timely correction of identified disorders are important. The question of the severity of deviations in general urine analysis depending on the form of primary tuberculosis and the timing of normalization of renal function while taking anti-tuberculosis drugs remains insufficiently studied and requires further development.

In phthisiatric practice, the absolute sign of tuberculous etiology of the disease is the detection of Mycobacterium tuberculosis (MBT). To identify the causative agent

of the disease, various pathological material is examined: sputum, gastric and bronchial lavages, exudates and transudates from the pleural and abdominal cavities, cerebrospinal fluid, pus from the esophagus, urine, menstrual blood, etc. There are also various methods for detecting Mycobacterium tuberculosis. The simplest and most accessible method is direct microscopy of smears stained using the Ziehl-Neelsen method. This study is used both to identify new tuberculosis processes and to monitor the success of chemotherapy [9,10,14]. Of great importance in this case is the quality of collection of pathological material by medical personnel, the correct preparation of smears and the conduct of research using modern microscopes. When examining patients with suspected pulmonary tuberculosis who did not produce sputum, or with negative results of the Ziehl-Neelsen sputum test, strict adherence to the rules for collecting bronchial lavage water made it possible to identify Mycobacterium tuberculosis by direct microscopy in 38.2% of cases [1,5]. Fluorescent microscopy is also significant for the diagnosis of tuberculosis [1,6,7,8].

Obtaining a pure culture of Mycobacterium tuberculosis by inoculating the test material is one of the leading and highly informative methods in the diagnosis of tuberculosis [7,8,9]. The cultural method for identifying MBT is recognized as the gold standard for diagnosing this disease. Bacteriological research makes it possible to isolate the pathogen when 1 ml of pathological material contains only 20 - 100 microbes. It makes it possible to identify the isolated culture and determine its sensitivity to antibacterial drugs. But what has been said is not always applicable to pediatric phthisiology, since tuberculosis in children occurs predominantly without bacterial excretion or with scanty bacterial excretion [14,15,16]. Therefore, research methods such as inoculating pathological material on nutrient media and, especially, various microscopy methods often do not provide information.

In uncomplicated forms of primary tuberculosis, the role of bacteriological research methods is very small [10, 19], which is explained by the difficulties in obtaining sputum from such patients and the rarity of detecting the pathogen in it.

The increase in the incidence of tuberculosis in both adults and children poses the task of TB service to its timely detection and treatment [15, 16]. The characteristics of a child's body and its physiology (especially at an early age) make it very difficult to diagnose tuberculosis on the basis of clinical and radiological data. Sometimes it is impossible to identify a symptom complex characteristic of a specific process [11,12,13,14]. It is impossible not to note the importance of timely detection of tuberculosis in adolescence. At this age, changes in hormonal levels and imbalances in body systems increase the risk of tuberculosis.

In conditions of oligobacillary primary tuberculosis, a list of the most significant laboratory criteria has not been developed that confirm the activity of specific inflammation at different stages of treatment. Rationalization of laboratory

examination of children and adolescents with tuberculosis is one of the components of all work to combat tuberculosis. Without solving this problem, it is unlikely that it will be possible to timely identify, effectively treat sick children and adolescents, and, ultimately, reduce their incidence of tuberculosis [6,7,8].

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