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PERSISTENCE OF TUBERCULOSIS INFECTION IN THE BODY AND LABORATORY DIAGNOSIS

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Abstract
In the process of persistence of tuberculosis infection in the body, morphological changes (both specific and nonspecific) are observed in the kidneys. It is known that kidneys take the main load of drug excretion during chemotherapy. In primary tuberculosis, pathologic changes in urine are detected in 28.4% of patients. They are more often observed in children with severe forms of tuberculosis and pronounced intoxication [2, 10, 12]. Leukocyturia and proteinuria are the most frequently detected, while hematuria and cylindruria are less common, which are based on increased vascular permeability of the microcirculatory bed due to immunological mechanisms in response to infection [7,9].

Keywords: Drug excretion, immunological mechanisms, tuberculosis, proteinuria.

Introduction

In the development of allergic reactions to antituberculosis drugs, the kidneys are involved in the pathologic process in the majority of sick children [2,6]. The degree of manifestation of such changes increases with increasing duration of treatment. Therefore, dynamic monitoring of the functional state of the kidneys and timely correction of detected disorders are important during therapy with tuberculostatic drugs. The issue of the severity of abnormalities in the general urine analysis depending on the form of primary tuberculosis and the timing of normalization of renal function against the background of TB 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 detect the causative agent of the disease, various pathologic material is examined: sputum, gastric and bronchial lavage waters, exudates and transudates from pleural and abdominal cavities, cerebrospinal fluid, pus from natellae, urine,

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menstrual blood, etc. Methods of detection of Mycobacterium tuberculosis are also diverse. The simplest and most accessible method is direct microscopy of smears stained according to the Cil-Nielsen method. This study is used both to detect fresh tuberculosis processes and to monitor the success of chemotherapy [2]. The quality of the collection of pathologic material by medical personnel, the correctness of smear preparation, and the conduct of the examination using modern microscopes are of great [2,3,4,5,6] importance. When examining patients with suspected pulmonary tuberculosis who did not excrete sputum or with negative results of sputum examination according to the Ziehl-Nielsen method, precise observance of the rules for collecting bronchial lavage water made it possible to detect Mycobacterium tuberculosis by direct microscopy in 38.2% of cases [1,5,6]. Luminescence microscopy is also important for tuberculosis diagnosis [1,7,8,9].

Obtaining a pure culture of Mycobacterium tuberculosis by culture of the test material is one of the leading and highly informative methods in the diagnosis of tuberculosis. The culture method of MBT detection is recognized as the gold standard for the diagnosis of this disease. Bacteriologic examination allows to isolate the pathogen when the content in 1 ml of pathological material is only 20 - 100 microbes. It makes it possible to identify the isolated culture and determine its sensitivity to antibacterial drugs.

However, this is not always applicable to pediatric phthisiology, since tuberculosis in children is predominantly without bacterial excretion or with scanty bacterial excretion [1,4,5,6,7,8]. Therefore, such methods of research as sowing pathologic material on nutrient media and, especially, various methods of microscopy often do not provide information. In uncomplicated forms of primary tuberculosis, the role of bacteriologic examination methods is very small [10.11], which is explained by the difficulties in obtaining sputum from such patients and the rarity of detection of the causative agent in it. Against this background, cytologic diagnostics of the tuberculous process is relevant and informative, with the help of which the tuberculous etiology of the inflammatory process of lymph nodes in children was confirmed in 35.0%-58.0% of cases. At the same time, the frequency of bacterial excretion in adolescents is much higher than in children under 14 years of age.

When searching for MBTs by all methods (direct and fluorescent microscopy, culture), they can be detected in adolescents with tuberculosis in 40.0%-57.0% of cases. The epidemiologic danger of this category of patients is aggravated by the fact that adolescents attend educational institutions (schools, colleges, technical schools), being in contact with a large number of peers. The problem of confirming the tuberculous etiology of pleural effusion is also one of the unresolved and difficult issues of bacteriologic diagnosis [3,4,5,6,7]. According to some authors [8,9], it was possible to confirm the tuberculous etiology of pleurisy by culture only in 6.3%-7.0% of cases. In the pleural exudate of patients with specific pleurisy, low-viable and biologically altered L-forms of Koch's bacteria are found more often than bacterial forms. As a consequence, the microscopic method of detecting Mycobacterium tuberculosis in pleural fluid is uninformative. It can be used only in combination with culture and biological methods [6,10,11,12].

There are data in the literature on a comparative analysis of the diagnostic significance of bacteriologic examination of different pathologic material from patients with limited non-destructive forms of pulmonary tuberculosis, which is most relevant for pediatric phthisiology.

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Sputum and bronchoalveolar flush obtained from the same patients were studied. It turned out that repeated examination of sputum obtained by irritant inhalation detected Mycobacterium tuberculosis in 16% of patients, while a single examination of lavage fluid detected Mycobacterium tuberculosis in 5.7%. As indicated by the authors [1,2,3], bacteriologic examination of bronchoalveolar flush is very informative. This method is especially productive when used in school-age children and adolescents. But the impossibility to use bronchoscopy to obtain bronchoalveolar flush in young children prompts to search for other - simpler and less traumatic methods of investigation. The most important criterion for method selection, of course, should be its informativeness.

A new era of laboratory diagnostics (in particular, diagnostics of tuberculosis) can be considered the development of the polymerase chain reaction method by Carrie Mullis in 1983.

PCR allows detection of the deoxyribonucleic acid of the pathogenic agent, regardless of its quantitative content. content in biological media of the organism. Many domestic and foreign works testify to the high efficiency of this method, both in adults and in children and adolescents [4,5,6,7,8]. This technique has a number of advantages: the possibility of direct determination of the infectious agent, high sensitivity, allowing the detection of single bacteria, and rapidity of the analysis (4-5 hours). According to the available literature, this method of detection of tuberculosis pathogen is not inferior in efficiency to bacteriologic method. It allows detecting Mycobacterium tuberculosis in patients with negative results of cultures. The frequency of such findings is about half of cases [1,5,9,10].

The PCR method is more accurate than culture in diagnosing and differentiating primary tuberculosis in children. Despite the high diagnostic capabilities of PCR, it has a disadvantage inherent in any other method - the probability of false-positive results [13].

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