Volume 2, Issue 12, December 2024 ISSN (E): 2938-3765

PCR MODERN METHOD OF LABORATORY DIAGNOSIS OF TUBERCULOSIS

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Abstract
The development of the polymerase chain reaction method by Carrie Mullis in 1983 can be considered a new era of laboratory diagnostics (in particular, tuberculosis diagnostics). PCR makes it possible to detect the deoxyribonucleic acid of the pathogenic agent regardless of its quantitative content in the biological media of the organism. Many domestic and foreign works [3,4,5,6,7] testify to the high efficiency of this method both in adults and in children and adolescents.

Keywords: Pathogenic agent, Mycobacterium tuberculosis, organism, enzyme-linked immunosorbent assay.

Introduction

This technique has a number of advantages: the possibility of direct determination of the infectious agent, high sensitivity, allowing the determination 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 [1,2,3,4]. PCR 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. Due to the low segregability of the tuberculosis pathogen on nutrient media and the oligobacillary nature of pediatric tuberculosis, much attention has been paid not only to molecular genetic but also to immunoallergic methods of diagnosis verification. Immunologic reactions (RNHA, RGC, ELISA for ^E) and hematologic PPN test are used to determine the specificity of the nature of the disease and the degree of its activity [5,6,7,8,9]. Thus, when determining the PPN in the presence of tuberculin, it was found that the higher the degree of local tuberculosis activity, the greater the

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neutrophil damage index. PPN is also applicable in the diagnosis of primary infection in children. It gives a positive response much earlier than the Mantoux test [10,11,12]. In some cases, attempts to confirm or refute the activity of the tuberculosis process using PPN in patients with subtle clinical manifestations have been unsuccessful. The diagnostic value of RNHA in the initial manifestations of localized tuberculosis in children is relatively low. It is higher for dynamic observations [1,2]. It was found that medium and high antibody titers are observed in the phase of reverse development of the tuberculosis process. In the diagnosis of pediatric tuberculosis, RNHA is informative only when assessing the course of the specific process and the adequacy of treatment [10].

The usefulness of enzyme-linked immunosorbent assay in children with tuberculosis is questionable. The ELISA, which is very effective in adult patients, is specific in children under 6 years of age in only 39.5% of cases, and its sensitivity is 20.7%. This makes the ELISA method unsuitable for serodiagnosis of early tuberculosis in children. The growing incidence of tuberculosis in both adults and children poses a challenge to the phthisiatric service for its timely detection and treatment [3,5,6,7,8,9]. The peculiarities of children's organism, its physiology (especially at an early age) significantly complicate the diagnosis of tuberculosis on the basis of clinical and radiologic data.

Sometimes it is impossible to identify a symptom complex characteristic of a specific process [4,5,6]. The importance of timely detection of tuberculosis in adolescence cannot be overlooked. At this age, changes in hormonal background, unbalanced body systems increase the risk of tuberculosis. As a rule, in case of untimely diagnosis of tuberculosis in adolescents develop severe forms of this disease, often with decay and bacterial excretion. Late detection of severe TB in adolescents depends on many reasons, but organizational shortcomings are the most important [7,8,9]. There is a generally accepted set of methods of clinical, radiological and laboratory examination of children for tuberculosis according to the instructions of the Ministry of Health and orders No. 33 of 02.02.1998, No. 109 of 21.03.2003. Regardless of the form of tuberculosis, a full range of examinations is carried out when a patient is detected and during treatment up to the transfer of the patient to the inactive tuberculosis dispensary group.

The peculiarities of organism reactivity in different periods of postnatal ontogenesis are not taken into account. In conditions of oligobacillarity of primary tuberculosis, the list of the most significant laboratory criteria confirming the activity of specific inflammation at different stages of treatment has not been developed. Rationalization of laboratory examination of tuberculosis patients in children and adolescents is one of the components of the whole work on tuberculosis control. Without solving this problem, timely detection, effective treatment of sick children and adolescents, and, ultimately, reduction of their TB incidence is unlikely to be possible.

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