New view of tuberculosis diagnosis

P.F. Sheshukov
(Vladimir, Russia)

Since the publication of the Order of the Ministry of Health of the Russian Federation No. 109 of March 21, 2003, "Improvement of anti-tuberculosis measures in the Russian Federation", the main regulatory document according to which doctors work - phthisiatricians, there have been certain changes in the epidemiology of tuberculosis in the Russian Federation. The incidence rate decreased from 86.1 per 100 thousand of the population in 2003 to 82.6 per 100 thousand in 2009, as well as the mortality rate, respectively: from 21.8 per 100 thousand of the population to 16.5 per 100 thousand. However, the indicators of the effectiveness of treatment of patients with tuberculosis remain at an extremely low level. Thus, the clinical cure of newly diagnosed patients registered in 2009 was 45.6%, and relapses tended to grow. At the same time, the level of primary and secondary multidrug resistance (MDR) of mycobacterium tuberculosis (MBT) has significantly increased.

The main reasons for the low effectiveness of treatment are: a high level of MDR MBT, late or late detection of tuberculosis, late diagnosis of MDR MBT in tuberculosis patients, a high proportion of destructive and widespread forms of tuberculosis among newly diagnosed patients, etc. Office. Long-term work (since 2002) on the apparatus according to the method of vegetative resonance test (ART) showed a variety of forms of MBT. In the body of a patient with tuberculosis, MBT finds itself in a wide variety of conditions, depending on the state of the macroorganism, its protective reactions and the impact of various environmental factors. Many researchers have described the morphological variants of MBT, which differ from the typical rod-shaped form:

coccoid - first described in 1883 by Malassez, Vignal, actinomycotic - described in 1888 by I.I. Mechnikov, granular - described in 1907 (Much H.) are formed with prolonged stabilization of tuberculosis or under the influence of antibiotic therapy, older in age, ultrafine (filtering) - described in 1910 A. Fontes are allocated in patients who have been taking anti-tuberculosis drugs for a long time. These forms are almost 20 times smaller than typical MBT,L-shapes - have a defective shell, described by domestic scientists in the 60s of the XX century, informational (wave-frequency) - isolated in 2008 by the ART method. All of the listed forms of MBT, under certain conditions, can be reversed into the original rod-shaped form. The mycobacterial population growing in the patient's body, therefore, is heterogeneous both in physiological and in the mechanism of pathogenetic effects.

Diagnostic difficulties in tuberculosis are generally recognized, although at present, practical medicine has a wide variety of methods that differ in their sensitivity, specificity, and, consequently, in their scope.

A look into the future (8th Congress of Phthisiologists of the Russian Federation 2007) L.B. Heifetz National Jewish Research Center. Denver, Colorado, USA (dreams of a phthisiopulmonologist)

1. Results can be obtained immediately (24-48 hours).
2. Results will include:

a) final bacteriological diagnosis of tuberculosis; b) regional
type of bacteria;
c) sensitivity to all drugs;
d) bacteriological diagnosis of about 100 species of non-tuberculous mycobacteria.

3. All data can be obtained without sending material to laboratories (close laboratories for unnecessary).

Laboratory diagnostics of tuberculosis is on the threshold of the era of molecular biological methods that have great prospects. Biochips process information in 7-8 times faster than conventional laboratory tests.

The genome of the M. tuberculosis H37Rv strain contains 4000 genes: 52% of genes have known their function; for 48% of genes, the function is hypothetical. This makes these methods questionable.

Despite the constant improvement of methods for diagnosing tuberculosis, the problem of early, sparing and, if possible, non-invasive diagnosis remains relevant. In the last 10 years, alternative, including biophysical, methods for diagnosing various diseases have begun to be used quite intensively in medical practice. One of these methods is ART.

As of today, the electronic data bank has been replenished with new information for the diagnosis of tuberculosis. These are 12 types of non-tuberculosis mycobacteria and various information on mycobacterium tuberculosis, which allows not only qualitatively but also quantitatively determine mycobacterium tuberculosis, carry out differential diagnostics with rounded and cavitary formations and determine the drug resistance of MBT. Not one of the currently known methods has these capabilities. LB Kheifets talking about

the dream of a phthisiopulmonologist, I had in mind the development of molecular genetic diagnostic methods tuberculosis, but this dream is already being realized by biophysical methods.

Comparison of methods for diagnosing tuberculosis

Method diagnostics	Detection	Feelings strength	Specific ness	results surveys	Flaws method
Tuberculino diagnostics Mantoux test	72 hours	76%	65.90%	Availability allergies (HRT)	non-specific
DST Diaskintest	72 hours	96.20%	84.60%		
Fluorography: - film - digital	24 hours 30 minutes.	no data	no data	structural changes lungs	1. High price equipment.
Bacterioscopy	2.5 hours	up to 46.4%	no data	availability of KUM	1. Low sensitivity. 2. Not determined species affiliation.
Luminis cent microscopy	3 hours	72%	no data		
Cultural method:				Availability of office species affiliation, typical affiliation, medicinal stability in vitro virulence	1. Long lasting time of receipt results. 2. High price equipment and expendable materials. 3. Additional costs for service systems. 4. High qualifying exactingness to staff.
- sowing on solid medium	1.5-2.5 months	71%	100 % ?		
- sowing on liquid media:					
Bactec 460	6-27 days	97%	90%		
Bactec MGIT 960	7-31 days	95%	98%		
ELISA	22 hours	68-92%	86-97%	The presence of antibodies	
PCR Polymerase chain reaction	4-6 hours	fifty-70% ~ 80–95%?	70% ~100 % ?	Availability of office species affiliation, typical affiliation, medicinal stability in vitro	1. High price equipment and expendable materials. 2. High qualifying exactingness to staff. 3. Separation premises on zones of special working conditions.
APD Laser fluorescent diagnostics	25-30 minutes Excluding time fence and centrifugation blood and delivery	93.7%	91.6%		
Biochip analysis	24-48 hours	up to 95%	98-99%		
Vegetative resonance test (ART)	15 minutes	95%	99%	Availability of MBT. Specific, typical affiliation, acuteness of the process, localization, medicinal stability in vivo	1. Low price equipment. 2. No consumables materials. 3. Non-invasive.

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