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Quick test spots TB

Immunodiagnosis allows for faster diagnosis of TB

VIENNA - A rapid, molecular-based diagnostic test helps to diagnose active tuberculosis in cases when the direct detection of *Mycobacterium tuberculosis* fails. The immune-based test, applied on cells obtained during bronchoalveolar lavage, allows for a faster initiation of anti-TB treatment, says **Claudia Jafari**, MD, Clinical Infectious Diseases Research Center, Borstel, Germany, at her oral presentation at the **19th Annual Congress of the European Respiratory Society**.

While the microscopic examination of sputum for acid-fast bacilli (AFB) is a simple and rapid test that provides a presumptive diagnosis of infectious tuberculosis, smear-negative cases still pose a diagnostic problem. In as many as 90% of pediatric TB cases and in every second adult with active pulmonary tuberculosis, acid-fast bacilli are not detectable in the sputum smear. Culture growth of *M. tuberculosis*, the diagnostic gold standard, not only takes two weeks for results, but has average sensitivity of only 80%.

There is still an unmet need to identify patients with active TB rapidly and prevent transmission when their sputum smears remain negative for acid-fast bacilli. The decision to start anti-tuberculosis treatment is especially difficult in the absence of a clear diagnosis.

Earlier diagnosis means faster, more appropriate treatment and less chance of transmission. While immunodiagnosis by peripheral blood Interferon-Gamma release assays (IGRAs) and tuberculin skin testing may be used in sputum-negative cases, these cannot distinguish between patients with active vs. latent TB, meaning that a negative result rules out TB but a positive result remains inconclusive.

In active TB, mycobacterium tuberculosis-specific lymphocytes are concentrated at the site of infection and can be detected by enzyme-linked immunospot (ELISPOT).

Researchers from the Clinical Infectious Diseases Research Center in Borstel, Germany and other centers through Europe investigated whether a Mycobacterium tuberculosis-specific, enzyme-linked immunospot assay (ELISpot) performed on cells gained at bronchoscopy could differentiate between patients who had sputum AFB smear-negative active tuberculosis and those with latent tuberculosis infection.

The prospective study by first author *Claudia Jafari*, MD, and colleagues included 347 patients at TBNET centers in Europe. All had suspected active tuberculosis, but either were unable to produce sputum or had AFB-negative sputum smears .

They performed the immune-based test ELISpot on peripheral blood samples, as well as on cells obtained from bronchoalveolar lavage. Additionally, Mycobacterium tuberculosis-specific nucleic acid amplification (NAAT) was performed on fluid obtained from bronchoalveolar lavage to detect nucleic acids from mycobacterium tuberculosis.

Of the 347 patients, 71 (20.4%) were diagnosed with active TB. Out of the 276 patients with an alternative diagnosis, 127 (46.0%) also had a positive peripheral blood mononuclear cells (PBMC) ELISpot result.

Sensitivity and specificity of BALMC ELISpot for the diagnosis of active pulmonary TB were 91% and 79%, respectively. The BALMC ELISpot diagnostic odds ratio (OR) of 40.4 was superior to those of PBMC ELISpot (OR 10.0), tuberculin skin test (OR 7.8), and M. tuberculosis-specific NAAT (OR 12.4) for diagnosing sputum AFB smear-negative tuberculosis. In contrast to PBMC ELISpot and the tuberculin skin test, BALMC ELISpot results were independent of any previous history of tuberculosis.

“The rapid diagnosis of active pulmonary tuberculosis is difficult when acid fast bacilli cannot be detected in sputum smears. ELISpot performed on cells from the bronchoalveolar fluid yields a high diagnostic sensitivity and specificity. In countries where bronchoscopies are routinely performed in patients suspected to be affected by sputum AFB smear-negative tuberculosis in order to rule out other lung diseases, the approach could speed up the diagnosis of active TB and the decision to initiate anti-tuberculosis treatment,” concludes Dr. Jafari.

The ERS is an organization of and for physicians, health professionals, and scientists that advances lung health through programs of education, research, advocacy and practice support that foster excellence in the field of respiratory medicine. For more information, see www.ersnet.org.

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