New test quickly ID's active TB in smear-negative patients

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Active tuberculosis can be rapidly identified in patients with negative sputum tests by a new method, according to European researchers. Active tuberculosis (TB) is the seventh-leading cause of death worldwide, and while the diagnosis of active TB can be rapidly established when the bacteria can be identified on sputum microscopy, in about half of all cases, the TB bacterium cannot be detected, making another diagnostic option critical in efforts to control the spread of TB.

The findings from the Tuberculosis Network European Trialsgroup (TBNET) are published in the October 1 issue of the American Thoracic Society's American Journal of Respiratory and Critical Care Medicine.

"In this study, we showed that a differentiation between active pulmonary tuberculosis and LTBI is possible by the ELISpot test," said principal investigator of this TBNETstudy, Christoph Lange, M.D., Ph.D., from the Research Centre Borstel, in Germany.

The World Health Organization estimates that approximately one-third of the world's population is infected with M. tuberculosis, the bacterium that causes TB, but only 10 to 20 percent of those will go on to develop active TB. The rest have latent TB infection, recently redefined as 'lasting tuberculosis immune responses' or LBTI, and are at risk for developing active TB at any time.

The researchers found that immune cells specific to the TB bacilli are concentrated in the airways of patients with active tuberculosis. These

cells could be readily identified with an enzyme-linked immunospot assay (ELISpot) and the results of the test are available in one day. The ELISpot test is then able to distinguish between LTBI and active TB by comparing the frequencies of TB-specific T-lymphocytes in the blood versus in the lung. The identification of tuberculosis bacilli by culture, considered the gold standard takes several weeks.

"Because bronchoalveolar lavage is routinely performed in this situation for other diagnostic purposes, the ELISpot does not result in an extra procedure for the patient," explained Dr. Lange

To determine the sensitivity and specificity of the ELISpot test, Dr. Lange and colleagues recruited 347 patients suspected of having TB, but who were either unable to produce sputum, or who had had three consecutive negative acid-fast bacilli sputum culture results. Their blood was drawn and bronchoaveolar lavage (BAL) was performed for use in ELISpot testing.

Of the 347 patients, 71 were diagnosed with active pulmonary TB. In patients with active TB, ELISpot results were positive in 65 cases (91.5 percent).

"These findings show us that positive result in the BAL ELISpot was highly indicative of and actual case of active TB," said Dr. Lange. "And a negative BAL ELISpot result almost excludes active tuberculosis."

The results confirm the findings of a 2006 pilot study, and further show that demonstration of concentration of tuberculosis-specific cells at the site of the infection is an important advance for the diagnosis of tuberculosis.

"Given the number of smear-negative cases of active TB that BAL ELISpot was subsequently able to correctly identify, about one in every

two patients with smear negative pulmonary TB will benefit from BAL ELISpot testing," said Dr. Lange. "Our results indicate that ELISpot is an important advancement to rapidly distinguish acid-fast bacilli sputum smear-negative active TB from LTBI in routine clinical practice."

"Future research about the immunodiagnosis of tuberculosis will need to identify indicators of treatment success that will allow safe discontinuation of antituberculosis therapy without an increased risk of the reactivation. This will be of great clinical importance to guide the treatment of individuals with LTBI and active tuberculosis, especially in cases of drug-resistant strains of M. tuberculosis," said Dr. Lange

Source: American Thoracic Society (news : web)

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