

New TB test reveals patients at risk, says study

October 20 2008

A recently introduced blood test can reveal which patients may develop active tuberculosis (TB) much more precisely than the 100-year old TB skin test, according to a new study published today in the journal *Annals of Internal Medicine*.

Around a third of the world's population is infected with the TB bacteria and approximately 9 million new cases of active TB are diagnosed around the world each year, according to World Health Organisation estimates. The majority of those infected live in the developing world.

The new ELISpot blood test is able to identify patients with a significant risk of developing the active form of TB, according to the study, carried out by researchers from Imperial College London working with international colleagues.

Patients with active TB experience the symptoms of the disease, which include fever, persistent cough, and loss of appetite, whereas patients with the dormant, 'latent' form of TB do not. Treatment can prevent many patients with latent TB from progressing to active TB.

The researchers believe that the ELISpot blood test can enable preventative treatment to be targeted in a more focused way than the tuberculin skin test. Unlike the blood test, the skin test commonly gives falsely positive results if a patient has previously been vaccinated against TB.

The blood test will allow doctors to identify and treat those who need preventative treatment whilst reducing the numbers treated unnecessarily, thus avoiding the attendant risks of drug side-effects, according to the researchers. This is especially important in the developing world where there are limited resources for both testing and treatment.

Today's research looked at 908 children in Istanbul, Turkey, who had recently been exposed to TB in their household. Of these, 594 tested positive for latent TB using the ELISpot blood test, the skin test, or both.

Of 550 children who tested positive for TB with the skin test, 12 went on to develop active TB. Fewer children tested positive for TB with the blood test (381), but the test still picked up 11 of the 12 children who went on to develop active TB.

Children with a positive ELISpot blood test result had approximately a four-fold higher risk of developing TB disease than children with a negative result. A higher proportion of children with a positive ELISpot blood test result developed TB disease compared to children with a positive TB skin test.

As a precautionary measure, 76% of the children in the study had been given prophylactic treatment to prevent them from developing active TB. This meant that the researchers could not determine the proportion of children who would have gone on to develop active disease had they remained untreated. Nonetheless, the study identified a significant risk for children with a positive ELISpot blood test result of developing active TB, despite the majority having received treatment, and this risk is therefore an underestimate of the risk in untreated children.

Professor Ajit Lalvani, the lead author of the study and a Wellcome Trust Senior Clinical Research Fellow at the Centre for Respiratory

Infection at Imperial College London, said: "A lot of people in places like the UK think of TB as being an old disease that we no longer need to worry about, but even in this country the numbers of cases have been rising for almost 20 years. Outside the developed world, TB has reached pandemic proportions and still causes an immense amount of suffering and death.

"Our study shows that new tools like the blood test can help tackle the global pandemic. We now know that the blood test really helps to target treatment to those who most need it in order to prevent them from developing active TB. Building on this work, we are now validating a next generation of tests that have been developed by our TB Task Force at Imperial," added Professor Lalvani.

The ELISpot test, which was created by Professor Lalvani and colleagues, works by detecting a protein signal, known as interferon-gamma, released by white blood cells of the immune system in response to TB infection. The test has been recommended for use alongside the skin test in around 20 countries worldwide, including the EU and North America.

Source: Imperial College London

Citation: New TB test reveals patients at risk, says study (2008, October 20) retrieved 23 April 2024 from <https://medicalxpress.com/news/2008-10-tb-reveals-patients.html>

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