Trials begin for 'essential' new TB vaccine

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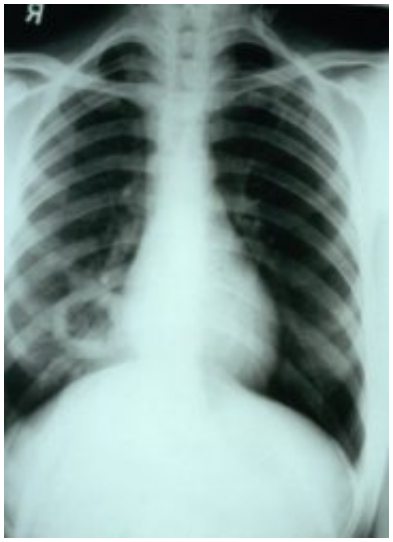

Cloudiness at the bottom left of the chest X-ray shows evidence of TB. Credit: The Wellcome Trust Medical Photographic Library.

Clinical trials are underway with the first new vaccine against TB in over 80 years. If successful, the tests will have major implications for TB control and could lead to the development of a new vaccine ready to use within eight years.

The need to control TB has become more urgent with the resurgence of the disease in many parts of the world, including a 10 per cent rise in England, Wales and Northern Ireland, and the emergence of multi-drug resistant strains.

TB, which is caused by the M. tuberculosis bacterium, is thought to kill two million people every year. The UK's Health Protection Agency recorded over 8,000 cases in 2005, including almost 3,500 in London alone.

The vaccine has been developed by Dr Helen McShane, a Wellcome Trust Senior Clinical Research Fellow, working with Professor Adrian Hill, a Wellcome Trust Principal Research Fellow, both at the University of Oxford. Dr McShane has been awarded a Strategic Translational Award from Technology Transfer at the Wellcome Trust to develop and test the vaccine, which currently leads the field. Additional funding has been provided by the European Commission.

Currently, the only vaccine against it is the BCG vaccine, which is administered to infants throughout the developing world and most of the developed world. However, the vaccination is only thought to be protective in preventing severe forms of the disease and is not effective in adults. In addition, antibiotics to deal with infection must be administered over many months and are becoming increasingly ineffective as the bacteria develop resistance to the drugs available.

‘In children, the current vaccine provides some protection against severe forms of the disease, but there is clearly room for improvement,’ explained Dr McShane. ‘The rise in the number of cases of multi-drug resistant forms of TB plus the increasing number of cases of TB in people living with HIV means a new vaccine is essential. We can no longer rely on antibiotics to treat the disease– we need to help the body's immune system prevent disease.’

The vaccine currently under development by Dr McShane, known as MVA85A, works in tandem to the BCG, acting as a booster. It uses the 85A antigen, a protein found in all strains of TB, to boost the response of T cells already primed by the BCG vaccine. T cells are produced by the body's immune system to fight infection. This vaccine uses a virus as a delivery system for the protein and the results of the clinical trials to date show the highest T cell responses ever induced with a vaccine.

‘This vaccine is safe and stimulates very high levels of the type of immune response we think we need to protect against TB. It is important for us to test whether or not this vaccine does work to stop people getting TB,’ said Dr McShane.

Following successful safety trials in The Gambia,

the drug has now entered phase II trials in The Western Cape in South Africa, where the incidence of TB disease in infants is 1 in 100 (despite BCG vaccination). It has first been tested in HIV negative adult volunteers and these trials are now being stepped down into adolescents, and also into HIV infected adults. Once Dr McShane and her team are fully confident of the safety of the vaccine, and the strength of the immune response induced by the vaccine, it will be given to infants to test its efficacy. This is important as one of the target populations for a new TB vaccine is infants.

‘The aim of our award is to enable Helen to demonstrate efficacy of the vaccine in a relevant population,’ said Dr Ted Bianco, Director of Technology Transfer at the Wellcome Trust, which is funding the trials. ‘There is a clear need for a new TB vaccine and so this work will have very significant healthcare implications both for the developed and developing worlds.’

Commenting on the trials, Paul Sommerfeld, Chair of TB Alert, said:

‘It is immensely important that a new, and potentially much more effective, vaccine against TB is going into second stage trials. The TB bacterium has for too long managed to stay a step ahead of human efforts as shown by the appearance, especially in HIV positive populations in Southern Africa, of a strain of tuberculosis resistant to virtually all known drugs against TB. To have a new tool for preventing TB would be a great step forward.’

Source: University of Oxford