

Research identifies type of vaccine that holds promise in protecting against TB

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Researchers are one step closer to finding a vaccine that better protects against tuberculosis. An investigational vaccine for TB tested at Saint Louis University appears likely to offer significantly better protection against the potentially fatal disease than the one in current use.

"Not only was it as safe as the standard vaccine, it induced a better immune response, which suggests it will be more effective at protecting against tuberculosis," said Daniel Hoft, M.D., Ph.D., director of the division of immunobiology at Saint Louis University School of Medicine and lead author of the study.

The investigational vaccine is made from a weakened TB germ from one of the strains of the current tuberculosis vaccine, which was created more than 75 years ago. The new "recombinant" vaccine uses an antigen – a secreted protein from a virulent strain of tuberculosis – to help focus the immune system on blocking aggressive and deadly TB organisms.

In this phase I clinical trial, researchers vaccinated a total of 35 study participants. The standard TB vaccine -- called Bacille Calmette-Guérin (BCG) -- was given to 17 study participants, and 18 study participants received the investigational recombinant BCG vaccine.

Researchers compared five immune functions induced by the vaccines and found that the investigational vaccine induced more powerful responses that are important for protection against tuberculosis. The investigational vaccine also was safe and well tolerated.

The research demonstrated that the concept of using a recombinant vaccine holds promise in being able to better protect people from tuberculosis. This vaccine will not be tested further because it uses an antibiotic resistant gene that scientists want to keep out of the environment. However research in this area will continue as scientists test a similar recombinant BCG vaccine that expresses the same and additional key TB antigens that is expected to be even more potent than the one just studied and does not include the antibiotic resistant gene, Hoft said.

"A new vaccine theoretically could not only protect against the overwhelming growth of TB organisms, but could kill residual organisms after a person has become infected. That's the hope," Hoft said.

It's critical to find a better vaccine, Hoft said. Tuberculosis strikes developing nations hardest, infecting one in three people worldwide. Nearly 8 million new cases of TB develop each year, and 2 million die from the infectious disease.

"These staggering statistics persist despite the availability of a tuberculosis vaccine," Hoft said. "New vaccines are urgently needed to reduce this immense burden of TB."

The World Health Organization recommends the current BCG vaccine for infants in developing countries shortly after they are born. The vaccine induces partial protection, and vaccinated children who contract a tuberculosis infection have a less severe illness. The current vaccine is about 70 percent protective against deaths or meningitis from tuberculosis and about 50 percent protective against pulmonary tuberculosis.

The research was published in an online edition of the *Journal of Infectious Diseases* at

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Source: Saint Louis University

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