

Researcher develops vaccine for fatal disease

October 20 2015

Over 200 million people in 74 countries suffer from schistosomiasis and four times that many are at risk for the disease since they do not have access to clean water. A recent discovery in the Texas Tech University Health Sciences Center (TTUHSC) research laboratory may make it possible to reduce the number of infections from this disease.

Afzal A. Siddiqui, Ph.D., has tested his new [vaccine](#) in animals and is now planning human trials. Siddiqui, a Grover E. Murray Distinguished Professor at the TTUHSC School of Medicine, received a patent from the U.S. Patent and Trademark Office for his schistosomiasis vaccine.

The vaccine, "SchistoShield" potentially can impact up to one billion people. The Bill & Melinda Gates Foundation and the National Institutes of Health have supported Siddiqui's research.

"We worked to get the patent to deter others from making money off this vaccine," Siddiqui said. "This way, it can be made for \$1 per vaccination and distributed to those in need. An effective schistosomiasis vaccine has the potential to impact one billion people."

Praziquantel, a drug developed over 40 years ago, is the only effective treatment available for schistosomiasis. However, re-infection frequently occurs following drug treatment. An effective vaccine is critical toward providing long-term treatment.

This schistosomiasis vaccine offers unique opportunities for organizations to market it as a method for completely eliminating this

disease. The vaccine's advantages make it easy to sell because it eliminates the instances of re-infection common with the current chemotherapeutic drug, is easier and less expensive to distribute and can be administered with current chemotherapy regimen. Long-term vaccine efficacy will effectively reduce the transmission of schistosomiasis in endemic areas.

According to the World Health Organization, there are no commercially available vaccines against schistosomiasis, which afflicts people in countries primarily in Asia, Africa and South America. Symptomatic schistosomiasis can result in increased susceptibility to sexually transmitted infections including HIV, which is prevalent in many countries plagued by schistosomiasis.

A person gets a schistosoma infection through contact with contaminated water. The parasite swims freely in open bodies of water. Once contact is made with humans, the parasite burrows into the skin, matures into another stage, and then migrates to the lungs and liver, where it matures into the adult form. Siddiqui said detection of calcified schistosome eggs in Egyptian mummies from the 20th dynasty (1250 to 1000 BC) tells us that schistosomiasis is an ancient disease.

"Major pathology of schistosomiasis is due to immunological reactions to schistosome eggs trapped in tissues," Siddiqui said. "Continuing infection causes enlargement of the liver and blood in urine. We see pictures of children from Africa with bulging bellies because of this disease."

Despite mass treatment with drugs, infection rates continue to rise. An additional 800 million people are at risk of contracting schistosomiasis. Durable and sustained reduction in the disease spectrum and transmission can only be obtained by long-term protection through vaccination. Siddiqui has studied schistosomiasis for over 20 years

working to develop this vaccine.

Provided by Texas Tech University

Citation: Researcher develops vaccine for fatal disease (2015, October 20) retrieved 23 April 2024 from <https://medicalxpress.com/news/2015-10-vaccine-fatal-disease.html>

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