

Ebola vaccine saves half in post-exposure testing, tests show

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An experimental Ebola vaccine developed in Winnipeg could eventually become the first treatment for people newly infected with the deadly virus.

Testing in three types of animals showed the vaccine kept at least half from dying when it was administered after infection, Canadian and American researchers reported in the Jan. 19 issue of the journal Public Library of Science Pathogens.

Most promising was the fact that four of eight primates injected with a lethal dose of Ebola virus survived when they were given the vaccine within 30 minutes of exposure.

The vaccine aims to tip the balance in favour of the immune system over the virus, said Dr. Steven Jones.

It is the first time a vaccine against one of the species of Ebola viruses has been shown to be effective in what's called a post-exposure setting. In fact, it's the first time anything has been shown to improve survival after infection with an Ebola virus.

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(CBC)

Most vaccines are given to prevent illness. But a few, like those for smallpox and rabies, are used after infection to help the immune system fight off the invading pathogen. In the case of infection with filoviruses like Ebola, Marburg and Lassa fever, that help is crucial because the viruses act by first suppressing the immune response.

"It's like a race," explained Steven Jones, head of immunopathology at Canada's National Microbiology Laboratory in Winnipeg, which is part of the Public Health Agency of Canada.

"With all of these infections I think that the reason they're so deadly is the virus always wins the race against the immune system. And what we've done is tip the balance back in favour of the host."

Jones and his co-authors, who are working on vaccines against the range of these viruses, last year reported that post-exposure testing of their Marburg vaccine protected 100 per cent of infected macaques monkeys — the type of primates used in this work as well. It also helped to protect mice and guinea pigs.

The macaque testing was set up to model how quickly the vaccine would be given if a researcher working with Ebola inadvertently infected himself or herself in a lab accident, as did a Russian scientist who died in 2004.

But the researchers hope that by fine-tuning the dosage and perhaps administering it in a series of injections — like rabies shots — the Ebola vaccine might prove useful in an outbreak, where it is unlikely infected people could get to treatment within half an hour.

Protective ring around patient

Ebola Zaire — the subtype used in this vaccine — kills 90 per cent of people known to be infected. It obliterates entire families as those caring for patients inevitably become infected themselves.

"If we know there is a case in the family, then we can come in and vaccinate all of the contacts and sort of ring the initial patient with people who will become protected," Jones explained.

"And the data from this paper shows that even if those people have been exposed to Ebola, there is potential for this vaccine to protect ... if we give it to them relatively early on."

Testing questions

While the works offers promise there may eventually be a way to change the course of devastating Ebola outbreaks, finding a way to test and license this and the other filovirus vaccines remains a vexing challenge. That is because there is almost no acceptable way to prove the vaccine can prevent infection in people or improve survival rates among those who become infected.

For that reason, the scientist credited with naming the Ebola virus viewed these findings with something akin to resignation.

"I don't think this takes us any closer to actually having something," said Dr. Karl Johnson, who headed the special pathogens unit at the U.S. Centers for Disease Control when Ebola first came to the attention of developed countries.

Johnson said it would be unacceptable to use the vaccine in Africa — where Ebola outbreaks occur — until it's been shown to be safe and effective elsewhere.

Thankfully, lab accidents with filoviruses are exceedingly rare because of the high levels of training and of biosafety required to work with these most horrific of viral killers. It could be years before there was even an opportunity to test the vaccine in a lab accident victim.

Jones agreed it would be "politically and ethically" unacceptable to use untested vaccines in Africa. But he insisted some way must be found to prove whether the vaccines are safe and effective in people.

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