Aerosol Vaccine Offers Protection from Deadly Ebola Virus

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A revolutionary, needle-free Ebola vaccine shows a high degree of protection from the deadly virus that continues to spread between species and is considered a breakthrough in the scientific community because of its inherent logistical advantages. Researchers published the study, showing success in rhesus macaque monkeys, in The Journal of Clinical Investigation. [1]

The aerosol delivery system offers significant benefits over traditional injectable vaccines by overcoming the obstacles of storing, transporting and administering injectable vaccines in isolated regions that lack medical facilities and trained personnel to administer injectable medications. [2] This vaccine could be a strong advantage for the indigenous population of economically disadvantaged African nations such as Sierra Leone or Liberia and of great practical value to military personnel stationed in areas vulnerable to the virus as well. A delivery system, which allows soldiers and support personnel to administer the vaccine themselves allows for improved logistical efficiency and greater numbers of mission critical personnel within a given deployment. The aerosol vaccine could be self-delivered, making the inclusion of any additional medical personnel unnecessary.

"Our study demonstrates the feasibility of needle-free immunization against Ebola virus, which is extremely important now, given the very high number of Ebola victims in Western Africa," said Dr. Alexander Bukreyev, a virologist at the University of Texas Medical Branch in Galveston and co-author of the study. "A needle-free vaccine will not require trained medical personnel, making it particularly useful in remote areas that lack adequate medical infrastructure." [3]

The initial long-term trials, conducted at the University of Texas at Austin's College of Pharmacy, protected primate subjects 100 percent of the time. The vaccine was delivered to each test subject via a nasal spray and saved the lives of all nine monkeys tested as part of the study. Continued monitoring of the test subjects showed the immunity gained from the introduction of the vaccine, which continues to remain within their bodies for over a year. [3]

While it could be about three years before the vaccine is approved for use in the field, researchers are conducting safety trials in a small number of human subjects. [4] The vaccine uses a mild, common respiratory virus, which is engineered to include genes from the Ebola virus. This genetic combination makes the outer coat of the virus identical to the more harmful Ebola virus. Tests show that the vaccine triggered two different forms of immunity: a localized immune response in the respiratory tract and a body wide immune system response in the form of cells circulating throughout the body. [4]

The aerosol spray delivery system offers yet another vital advantage in the Ebola ravaged regions of West Africa. According to Robert Garry, a researcher at Tulane University, it could overcome a social taboo which may have cost many lives up to this point. In many West African cultures it is considered socially unacceptable to allow needles to be stuck into their bodies, a problem avoided all together by the aerosol delivery system. [1]

If the vaccine proves safe in follow up trials, most experts agree it would make sense to begin use by vaccinating health care workers, who are badly needed to care for Ebola patients and are at high risk of infection themselves. [3]

References:
an Ebola vaccine you can inhale. *Newsweek,* p. 35-37.


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Medical supplies are airlifted to areas affected by the Ebola outbreak. (Photo courtesy of Carol Han, OFDA/USAID)