Press release

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The University Hospitals of Geneva to test the Canadian VSV-ZEBOV experimental vaccine against the Ebola virus

In order to counter the Ebola epidemic, the World Health Organization (WHO) has established a programme to fast-track human trials of two vaccine candidates that have proven effective in monkeys. The Canadian Public Health Agency developed one of them, the VSV-ZEBOV vaccine, and donated 800 vials to WHO. The vials are being stored at the University Hospitals of Geneva (HUG), which will now launch one of the four clinical trials coordinated by WHO to test this vaccine candidate. The trial at HUG will include roughly 115 volunteers; trials in Germany, Kenya and Gabon will include 30, 40 and 60 volunteers, respectively. While the HUG study already received approval from the ethics committees of the Canton of Geneva and WHO, it has now received the required approval from Swissmedic to launch this clinical trial in healthy volunteers aged between 18 and 65 years. The first vaccinations are scheduled to take place on 10 November 2014.

The VSV-ZEBOV is a "live" vaccine candidate. It is produced using a virus that is not considered dangerous for humans, the vesicular stomatitis virus (VSV), which has been modified to produce the surface protein found on the Zaire strain of Ebola virus (ZEBOV). This protein should trigger an immune response in vaccinated individuals with no risk of acquiring Ebola virus disease. The vaccine candidate was 100% effective in protecting monkeys from lethal doses of Ebola virus. The researchers involved in this study, led by Professor Claire-Anne Siegrist, head of the Vaccinology Centre at HUG, hope that the findings from non-human primate experiments will be confirmed in humans.

Hope for a lasting immune response

Our body defends itself against aggressors by producing antibodies and specialized white blood cells to destroy viruses and kill infected body cells. The purpose of a vaccine is to alert these immune defences in advance, so that they can react quickly in case of exposure.

This process is more efficient and lasts longer if a modified "live" virus is used for vaccination (as in the case of VSV-ZEBOV or the measles vaccine). In such a case, the modified virus is able to infect

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cells and replicate for a few days before being eliminated by the immune system. A vaccine that does not replicate triggers a milder and less lasting stimulation of the immune system, which is why it often requires subsequent booster vaccinations.

Expected side effects

In humans, naturally-occuring VSV only rarely causes infections; it may cause flu-like symptoms for a few days. The VSV used for this vaccine candidate has been "attenuated" to cause even fewer symptoms. The safety profile of VSV-ZEBOV is only beginning to be tested in humans and has not been tested on large numbers of monkeys. In vaccinated animals, the vaccine candidate was very well tolerated and caused no observable side effects, even in monkeys with a severely weakened immune system.

Because the vaccine contains a weakened form of VSV, it is likely to cause either no side effects or a mild inflammatory reaction with "flu-like" symptoms for a few days. As with any medicine, the vaccine can cause an allergic reaction, which is why volunteers will remain under observation for an hour and a half after the injection. Other side effects, even if they have not been observed in animals, cannot be excluded in humans and any long-term effects are unknown. As the VSV-Ebola vaccine contains only the envelope of the Ebola virus, there is no risk of contracting Ebola virus.

Trials in five countries

Five countries are involved in the first clinical trials of the VSV-ZEBOV vaccine in humans. In the USA, the first injections began in mid-October 2014; two US trials will collectively enrol 78 volunteers. The other four trials will be conducted under the auspices of WHO. The vials stored at HUG will be used for the clinical trials involving 115 volunteers in Geneva, 30 volunteers in Germany, 60 in Gabon and 40 in Kenya.

The HUG clinical trial is now recruiting healthy adult volunteers. Priority will be given to those planning to travel to areas affected by the epidemic in West Africa. These volunteers will be randomly selected to receive one of two vaccine doses. Other volunteers with no significant risk of Ebola exposure will randomly receive either one of the two vaccine doses or placebo.

This clinical trial will evaluate the vaccine candidate's safety and the dose required to trigger optimal immune responses. It will take two months to get the first results. The most effective dose of the vaccine will then be used to perform larger scale safety studies, and to vaccinate frontline healthcare workers in epidemic areas, in order to determine whether the VSV-ZEBOV vaccine protects against the Ebola virus in a clinical setting.

The clinical trial is led by Prof. Claire-Anne Siegrist, head of the Vaccinology Centre at the HUG, with the support of Drs Angela Huttner and Julie-Anne Dayer of the Division of Infectious Diseases, and Dr Alain Matthey of the Centre for Clinical Research (all at the HUG). The Vaccinology Centre at the HUG is a WHO collaborating centre, and the Clinical Research Centre and the Faculty of Medicine of the University of Geneva are part of the national network of Clinical Trial Units (CTU).

Vaccine candidate doses will be prepared at the HUG's pharmaceutical unit. Analyses related to the monitoring of the volunteers will be performed at the Virology Laboratory at HUG, which is also the Swiss reference centre for emerging viral infections.

These Phase I clinical trials are funded by the Wellcome Trust (UK), a not-for-profit foundation that supports health programmes worldwide.

The clinical trial in short

The trial will compare 2 different doses of the vaccine candidate to each other and to placebo to determine whether they differ in side effects and immune responses.

- Priority will be given to volunteers planning travel to Ebola-affected countries. These volunteers will not receive placebo; they will receive one of two vaccine doses.
- The trial includes 9 hospital visits (including a pre-enrolment screening) at HUG's Clinical Trials Unit over a period of 24 weeks. The first two visits will last 1.5 – 2 hours, the remaining visits 20-30 minutes each.
- For volunteers likely to travel to Ebola-affected countries, some visits may be conducted remotely, but a minimum 14-day stay in the Geneva area is required after vaccination to allow for monitoring.
- Because the vaccine is made from the VSV virus and contains only the envelope of the Ebola virus, there is no risk of contamination with the Ebola virus.
- Compensation for study participation is 810 Swiss Francs (approximately US$ 840, EUR 670).
- Participation is anonymous; all data will be handled confidentially.

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