

HEALTH

US army studies malaria vaccine

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By [Eric Niiler](#)

Early on a cold fall morning, a dozen volunteers gathered in a waiting room at the Walter Reed Army Institute of Research outside Washington, D.C. They had come to test an experimental malaria vaccine.

The volunteers included college students, Walter Reed employees, and a 41-year-old single mother from Baltimore named Renee Krueger.

Krueger said she had volunteered because she wanted to help people at risk for malaria, including U.S. troops serving overseas.



Renee Krueger (Photo: Eric Niiler)

"Every medicine that we have, whether it's over the counter or prescription, somebody had to be willing to try it," Krueger said.

Right now, there is no clinically available vaccine for malaria, although there are some experimental ones in the works. Walter Reed researchers wanted to test a new vaccine they hoped would protect against Plasmodium vivax, one of the four major strains of malaria parasite.

Col. Chris Ockenhouse, director of Walter Reed's malaria vaccine research program, said the volunteers would permit a quick test of whether the vaccine had promise.

"If you had to do this same process out in the field," he said, "you may have to vaccinate tens of thousands of individuals and wait a year or two to determine whether your vaccine worked or not."

Here, the research would take just two weeks. The scientists would vaccinate these volunteers and then intentionally infect them with the malaria parasite to see if they got sick.

The stakes were high. It had taken six years of lab work just to get to this stage of vaccine development. Col. Ockenhouse said he was "cautiously optimistic" that the vaccine would fully protect at least some of the volunteers from malaria.

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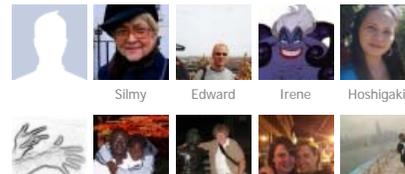
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"I hate mosquitoes," said Renee Krueger as she rolled up her sleeve.

Krueger had already received the experimental vaccine. Now she was about to become infected.

She joined the other volunteers around a table and placed her bare arm over a small screen-covered canister. It held five mosquitoes that carried the malaria parasite.

Krueger couldn't leave until she had been bitten by all five. That took close to an hour.

"They're starting to itch a little bit where the mosquitoes bit me," she said. "But other than that, I'm fine."

With the protection of the experimental vaccine, Krueger hoped she would stay fine. But some of the other volunteers knew that they would not stay healthy.

Army First Sergeant Joe Civitello was in the "control arm" of the study – a comparison group of volunteers that would not receive the vaccine.

"I'm going to get malaria," he said with a nervous laugh. "Somebody's got to do that part too, right?"

After being infected, the volunteers headed home. They went back to work and to their families. Meanwhile, the malaria parasites were moving through their bodies. The parasites infect the liver then reproduce and move to the bloodstream, where they attack red blood cells.

It takes at least ten days before any symptoms set in. So, on the ninth day, the volunteers returned. This time, they checked into a hotel, where Walter Reed doctors would monitor their health.

Waiting for Symptoms

It was a Friday night, and Renee Krueger felt great. In fact, she had brought her two daughters for the weekend. "They're excited," she said. "When they go to the hotel, they think we're on vacation."

On Saturday, Krueger took the girls shopping and to the hotel's indoor swimming pool. That same day, Sergeant Civitello got sick, just as expected.

It started with achy muscles. "Then the headache and the fever and the diarrhea started to kick in," he said, "and you're like, uh, this is not fun."

Doctors immediately treated him with two kinds of anti-malaria medicine.

Meanwhile, on Sunday morning, Renee Krueger still felt pretty good. Then, that afternoon, she got a call from the doctors. They had been testing her blood, and they found malaria parasites multiplying in her body. She needed to go on medication.

"I was a little surprised when I got the call," said Krueger. "I was a little tired but I just thought that was from being lazy today. But I guess maybe that's why I'm tired."

Over the next several days, Krueger developed the typical symptoms of malaria – achy muscles, nausea, and fever.

The fact that she and others who were vaccinated got sick suggested the vaccine was not working. But Major Jason Bennett, who was running the clinical trial, tried to remain optimistic.

"The main goal of this trial was to test the safety of the vaccine," he said, "[and] we know that the vaccine is safe." He said it would take more analysis to determine how effective the vaccine was. Even if vaccinated people got sick, Bennett said the vaccine might have delayed symptoms.

Four days later, on Thursday, the trial was done. By now, Renee Krueger had recovered from malaria, but she looked exhausted. And she was disappointed.

"We wanted it to work," she said. "It would have been nice to be part of something that could have been life-changing for a lot of people. It could have saved a lot of lives."

Failure is the norm in early vaccine trials, which is why researchers are working on other approaches to immunizing people against malaria.

Those experimental vaccines will also need to be tested on humans. Walter Reed's doctors say they will be looking for new groups of volunteers later this year.


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