

# Doctors Kill Parasitic Worms By Poisoning the Bacteria in Their Innards

In some African villages, nearly everyone is infected with *Mansonella perstans*, a parasitic worm that's remarkably hard to kill. It's resistant to standard anti-worm medications, but researchers have learned that an old antibiotic can vanquish the tiny beasts — in a roundabout way. The parasites are stuffed with a type of bacteria called wolbachia, and



In some African villages, nearly everyone is infected with *Mansonella perstans*, a parasitic worm that's remarkably hard to kill. It's resistant to standard anti-worm medications, but researchers have learned that an old antibiotic can vanquish the tiny beasts — in a roundabout way.

The parasites are stuffed with a type of bacteria called wolbachia, and apparently they depend upon those microbes for their own survival. By killing the bacteria inside of the worms, doctors can destroy the worms themselves.

## ADVERTISEMENT

To test that concept, an international team recruited volunteers with *M. perstans* infections from four villages in Mali, and gave 69 of them a dose of doxycycline each day. After one year, all but two of the patients who took the antibiotic were free from worms in their blood.

"Doxycycline is the first drug that has been shown to be effective in clearing *Mansonella perstans* parasites from the blood of infected people," said Amy Klion, a doctor at the National Institutes of Health who led the study. "The fact that the parasites were not detectable in the blood 3 years after the 6 week treatment suggests that doxycycline also had an effect on the adult worms, which live in the tissues surrounding the lungs, heart and abdomen."

Roughly 120 million people worldwide are infected with filarial parasites. Many of those worms will fall after a single dose of albendazole and ivermectin, but *M. Perstans* is too tough for both drugs. Thankfully, it's far less destructive than other types of nematodes. It usually results in itching, fatigue, and dermatitis.

Wolbachia have proven to be the Achilles' heel of nastier parasites too. Before Klion and her team showed that doxycycline can be used to treat the annoying worm infections, other doctors learned that it is an effective way to eliminate their nasty cousins, the parasites that cause elephantiasis and river blindness.

Despite the success of those treatments, nobody knows for sure why the worms and bacteria are interdependent.

"The basis of the endosymbiosis between wolbachia endosymbionts and their wormy hosts is currently not understood.," wrote Achim Hoerauf, a doctor at the Bonn University Clinic in a commentary for the *New England Journal of Medicine*. "Some conclusions can be drawn from the fact that worms lack essential genes for certain metabolic pathways that are present in wolbachia, and vice versa."

Hoerauf suggested that the treatment might not work everywhere. In other parts of Africa, researchers have found worms that can live without wolbachia. Despite that concern, he is convinced that the antibiotic will work in some parts of the world. When the infectious disease expert emailed us, he was on his way to distribute the antibiotic in Ghana.

At less than two dollars for a six-month supply. Doxycycline is a bargain for nongovernment organizations. But they might not buy it for the purpose of eliminating *M. perstans*.

"Doxycycline is not very easy to administer as a mass drug treatment since it absolutely cannot be given to pregnant women or children under the age of 12 because of effects on developing teeth and bones," said Klion. "Second, courses shorter than 4 weeks have not been very effective in other filarial infections, and this is a very impractical for mass administration."

Because the symptoms of *M. Perstans* infections are pretty mild, Hoerauf doubts that charities will try to eradicate it with doxycycline. But he thinks that the versatile drug will be used to treat many cases of river blindness.

*Citation: A Randomized Trial of Doxycycline for Mansonella perstans Infection, New England Journal of Medicine, 361, 2009*

*Photo: [DraconianRain](#) / flickr*