

Could interferon help treat Ebola?

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Among medication options shown to prolong survival in Ebola-infected monkeys, only interferon is commercially available and has a safety profile for use in humans.

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In early August, amid rising alarm about Ebola, immunologist Eleanor Fish of the University Health Network in Toronto contacted a friend of her family in Sierra Leone, one of the countries hit hardest by the outbreak, to say that the antiviral drug interferon might be helpful. There are no approved treatments for Ebola, but Fish, an expert on interferon, knew of a [study published last year](#) that showed interferon prolongs survival in monkeys infected with Ebola and the related Marburg virus.

She heard back from an assistant to Sierra Leone President Ernest Bai Koroma and then from a World Health Organization (WHO) official, who

asked her to join a group of scientists charged with developing a list of potential Ebola therapies and vaccines. After two weeks of discussions, the group headed to WHO headquarters in Geneva to make their case at an [international research consultation](#), but once there, Fish says, they got a reality check from “the African communities that were affected, in terms of their urgency in wanting some action.”

Very few of the interventions the group considered can meet that urgent demand. The experimental drug ZMapp, developed in part at the Public Health Agency of Canada, was [studied in monkeys](#) with stunning results and has been used by seven people infected with Ebola. But it will be out of stock for months and is given intravenously, which is a challenge in Ebola-affected areas.

Another intravenous drug, TKM-Ebola, in development by the British Columbia company Tekmira with funding from the US Department of Defense, was in a Phase-1 human safety trial last spring that was placed on a “full clinical hold” by the US Food and Drug Administration (FDA) after a participant receiving the highest dose experienced nausea, vomiting, tachycardia and hypotension. In August, the agency downgraded that to a partial hold, meaning individuals infected with Ebola could receive the drug.

Last week, [Wall Street was rife with rumours](#) that it was given to a doctor recovering from Ebola at Nebraska Medical Center in Omaha. With drug agencies [fast-tracking Ebola therapies](#), the company could possibly win approval for a study of the drug in Ebola patients, but may move slowly due to the safety issues.

There are two potential vaccines, including one that Canada is donating to the WHO, but there’s no evidence they are safe. Safety trials began this month in the US and Great Britain and if those go well, the plan is to study the vaccines in clinical trials in health care workers in West Africa.

Among medication options, only interferon is commercially available and, says Fish, “This is the only drug that’s actually got a safety profile in humans; it’s FDA-approved.”

David Kelvin, a virus expert at the University Health Network’s Toronto General Research Institute, cautions that the safety profile may not apply for Ebola, “because you can give a drug for toxicity to a healthy person and it’s very different from giving it to somebody who actually is infected with a

virus or some other type of infectious agent.” But Kelvin believes a “credible study” of interferon should go forward.

Dr. Michael Kurilla, director of the Office of Biodefense Research Affairs at the US National Institutes of Health (NIH), reviewed what he terms “a fair amount of existing data on interferon,” and concluded, “It’s certainly not a cure for the disease, that’s clear.” But he, too, thinks it has a role.

“If you can get interferon in early on, in the nonhuman primate [monkey] model, what you see is a delay to death and a reduction in the level of viremia, both of which would seem to be good.”

The NIH is discussing a combination therapy — adding interferon to another available antiviral drug, ribavirin — and “working out the details” for studying the combination in monkeys. “If it shows efficacy in a nonhuman primate study, that might be something easily implementable in patients,” Kurilla says.

WHO Assistant Director-General Dr. Marie-Paule Kieny gave the WHO assessment at the close of the consultation: interferon could be tried in patients “with early disease.”

But the Liberian and Guinean delegations in Geneva weren’t waiting for the WHO’s opinion. They’d already approached Fish to ask about the drug and she has continued those conversations by e-mail, writing a protocol that they can share with local clinicians. The drug she suggests using, Infergen, is made in Germany and distributed by Ukraine-based Pharmunion BSV development, which will donate it in the amounts needed. “Maybe the start would be to go to somewhere like Conakry,” Fish says, mentioning the capital of Guinea, “where they have a good centre and good beds, and that’s our first cohort that we study, 20 patients. Maybe that’s the start, and based on that we can very rapidly roll out elsewhere.”

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