# Probable Unusual Transmission of Zika Virus

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[Ted Pestorius] Hello. I'm Ted Pestorius. I'm talking today with Dr. Brian Foy, Associate Professor at Colorado State University. We're talking about an article that appears in the May 2011 issue of CDC's journal, Emerging Infectious Diseases. This study looks at a possible non-vector-borne, sexual transmission of Zika virus. Welcome Dr. Foy.

[Brian Foy] It's a pleasure to be with you, Ted.

[Ted Pestorius] Dr. Foy, tell us a little about Zika virus.

[Brian Foy] Zika virus is a relatively unknown and poorly-understood virus that's transmitted by mosquitoes. It's from the same family of viruses that contain yellow fever virus, the dengue viruses, and West Nile Virus. Zika virus is found in parts of Africa and Southeast Asia, and seems to be primarily associated with monkeys. It was first isolated from a monkey in the Zika forest in Uganda in 1947; since then, relatively few human cases have been identified. The most common symptoms of Zika virus in humans are body rash, strong headache, fatigue, joint swelling, and muscle pain that last from several days to a week. Zika virus has the potential to emerge in explosive epidemics. In 2007, a large outbreak occurred on Yap Island in the South Pacific, infecting almost two-thirds of the island's inhabitants.

[Ted Pestorius] So, tell us about your study.

[Brian Foy] The study describes three unusual cases of disease from a mosquito-borne virus that occurred in September 2008 in northern Colorado. In August 2008, two American scientists were working and living in villages in southeastern Senegal all of August of that year, on a project involving research on mosquitoes and malaria. They were bitten often by mosquitoes. This region is well-known for many mosquito-transmitted viruses and for the numerous wild primates living in the forests around the villages. When the scientists returned home to northern Colorado, they both got sick with what seemed to be a mosquito-borne disease. The remarkable part about this study is that the wife of one of the scientists got sick with the same symptoms approximately four days after her husband became ill. Blood tests concluded that all three patients were infected with Zika virus. The big question was, 'How did the scientist's wife become infected?'

[Ted Pestorius] So what did you finally conclude?

[Brian Foy] We concluded that there was strong evidence of direct, person-to-person transmission of Zika virus. We also concluded that there is good, but circumstantial, evidence that it was transmitted through sexual activity. The tropical mosquitoes known

to transmit this virus don't live in dry and temperate northern Colorado, there was little local mosquito activity in early September when the nights are cool, and the virus wouldn't have had enough time to incubate in the local mosquitoes (assuming it could develop in them) to infect the scientist's wife so soon after he came home. Our circumstantial evidence of sexual transmission is based on the fact that the scientist reported a swollen prostate and blood in his semen as symptoms of his illness, and that he and his wife had intercourse soon after he returned home but before he got sick. Furthermore, the couple have four children, but none of them got sick after his return, suggesting that Zika virus is less likely to have been transmitted through saliva or other types of direct contact.

[Ted Pestorius] Although there are no other documented cases of sexually transmitted Zika virus, is it possible it's more common than is currently known?

[Brian Foy] That's the million-dollar question. Our study highlights this possibility, and suggests we need to research it further. On the other hand, we could have simply recorded a rare transmission event. Currently, I think that in most cases, mosquito-transmission is likely to be the norm, especially in endemic areas. However, in epidemics, where the virus explosively emerges in a previously-unexposed human population, sexual transmission may play a role.

[Ted Pestorius] What are the next steps to investigate this form of transmission?

[Brian Foy] The first step is to explore Zika virus transmission in animal models in the laboratory. Very little work has been done on this in the last 30 years. We need to see if the virus 'hides out' in body fluids and tissues of animals it can infect, and if the virus can be passed between animals through copulation. If this work turns up something promising, we can try to perform epidemiologic studies of Zika virus transmission to humans living in endemic areas. If another outbreak of Zika virus occurs, such as the one on Yap Island, epidemiologists should try to gather clinical and sociological data that could determine if alternative routes of transmission are occurring, including sexual transmission.

[Ted Pestorius] Dr. Foy, what are the health implications if Zika *can* be spread through sexual intercourse?

[Brian Foy] They are currently unclear. As I speculated earlier, this may only matter in Zika virus epidemics, which seem to be very rare. Although it might be presumed from this study and other sexually transmitted viruses, the fact is we don't know whether females are more susceptible to such transmission, compared to males. We also don't know how Zika virus disease might present differently if transmission were through a mosquito bite versus through sexual intercourse. Many questions remain, which makes this an exciting new field of study.

[Ted Pestorius] Thanks Dr. Foy. I've been talking with Dr. Brian Foy about a study in the May 2011 issue of CDC's journal, Emerging Infectious Diseases. You can read the entire

article online at www.cdc.gov/eid. If you'd like to comment on this podcast, send an email to eideditor@cdc.gov. That's eideditor – one word - at c-d-c-dot-gov. I'm Ted Pestorius, for Emerging Infectious Diseases.

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