

Reassortment Group A Rotavirus from Straw-colored Fruit Bat (*Eidolon helvum*)

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[Karen Hunter] Hello, I'm Karen Hunter. With me today is Dr. Mathew Esona, a senior research fellow in the Gastroenteritis and Respiratory Virus Laboratory Branch, Division of Viral Diseases, at CDC. We're talking about a paper in the December 2010 issue of CDC's journal, Emerging Infectious Diseases. Dr. Esona is the lead author of an article that looks at the detection of rotaviruses in fruit bats and the discovery of a unique rotavirus strain. Welcome, Dr. Esona.

[Mathew Esona] Thanks, Karen. It's great to be here.

[Karen Hunter] Dr. Esona, what are rotaviruses?

[Mathew Esona] Rotaviruses are the most common cause of diarrhea in infants and young children, and are a serious public health issue. About half a million children under the age of five die every year from rotavirus infections. Rotavirus is found worldwide but most of these deaths occur in non-industrialized countries, like Kenya, which is where we did our study. There are vaccines to protect children from rotavirus, but in many parts of the world it isn't widely available.

[Karen Hunter] How is rotavirus transmitted?

[Mathew Esona] Like many gastro-enteric infections, it follows a fecal-oral route. That is, people get sick with rotavirus infection after putting something in their mouth that has been contaminated with fecal material containing the virus. This is one reason the infection is so common in young children. Toddlers don't stop to think about infectious disease when they decide to taste something they've picked up off the ground.

[Karen Hunter] What is the connection between rotavirus and bats?

[Mathew Esona] Until we did this study, we weren't sure there was one. Rotaviruses can be zoonotic, that is, become an infection that is passed from animals to humans. In addition to humans, rotaviruses are found in a number of animals, such as pigs and cattle. We were interested in identifying other possible animal reservoirs for rotavirus. Fruit bats are common in Africa and are known to roost in orchards near villages. Bats are also recognized as hosts for a number of viruses that can cross the species barrier and cause serious infections in people, such as Marburg virus, coronavirus, and rabies. We want to know if bats could also play a role in transmitting rotavirus. If they did, the knowledge would be useful in public health efforts to prevent the disease.

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[Karen Hunter] What did you find?

[Mathew Esona] We did find rotavirus, a novel rotavirus A species. The isolate we found had a unique genetic background that required establishment of new genotypes for at least seven genes. This was the first time rotavirus had been found in bats and from a researcher's perspective, finding something this unique is exciting. Interestingly, this was a finding we were not expecting, the virus is a reassortment virus which includes human rotavirus genes. Reassortment of human rotavirus genes onto animal rotavirus strain backbone has been done experimentally, but this bat rotavirus represents the first finding of natural reassortment. It seems to indicate there have been interactions between bat and human strains of the virus.

[Karen Hunter] Does this mean the bats may have picked up the rotavirus from humans?

[Mathew Esona] We don't know. There are a number of possibilities. For example, it is possible bats could have become infected with a human rotavirus by drinking water that had been contaminated with sewage. Or they could have eaten fruit contaminated by night soil which is human waste being used as fertilizer in an orchards. However it happened, documentation of a human-to-bat transmission event of any infectious virus is unprecedented. Scientists are known for concluding their papers by saying further research is needed, but in this case, the question of rotaviruses in bats definitely deserves additional study. Our study was a small one done in a limited geographic area. We need to find out just how common rotavirus infection is in bats, and if similar natural reassortment strains exist in bats in other regions of the world.

[Karen Hunter] Thanks, Dr. Esona. I've been talking with CDC's Dr. Mathew Esona about a paper that appears in the December 2010 issue of CDC's journal, Emerging Infectious Diseases. You can see 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 cdc.gov. I'm Karen Hunter, for Emerging Infectious Diseases.

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