Rotaviruses

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[Ted Pestorious] Hello, I'm Ted Pestorious, speaking today with Dr. Jon Gentsch, a microbiologist with the Division of Viral Diseases here at CDC. We're here to talk about a couple of rotavirus articles appearing in the January 2009 issue of Emerging Infectious Diseases. Jon, can you tell me a bit about rotaviruses?

[Jon Gentsch] Well, Ted. Rotaviruses are known as the most important cause of severe gastroenteritis in children less than five years of age. Essentially, all children around the world get the disease during the first few years of life. In industrialized countries, rotaviruses can cause high rates of hospitalization but small number of deaths. In developing countries, in addition to hospitalizations, the rotaviruses cause high death rates among children, with approximately 600,000 deaths per year worldwide.

[Ted Pestorious] Why would we consider rotaviruses emerging infectious diseases?

[Jon Gentsch] Rotaviruses can be emerging diseases in a couple of ways. First, all children can get several common rotaviruses. We and others documented five different but related microorganisms, or serotypes, that are common around the word. But many other novel or rare serotypes aren't frequently detected. Some of these rare serotypes of rotavirus are becoming more prevalent. In this sense, we think of these less common rotaviruses as emergent. And secondly, sometimes the more common rotaviruses can decrease in prevalence for a period of time, but then they reemerge for reasons that are not fully understood. The reemergence may occur because people who were once immune are no longer.

[Ted Pestorious] So can you tell us a bit about your study?

[Jon Gentsch] Sure. Our study was designed according to World Health Organization–sponsored studies in Africa from 1998 to 2004. Before vaccines can be developed, common types of rotaviruses need to be identified for baseline data. We collected hundreds of virus samples from several countries. And of the samples collected, we could not genetically identify some of them by routine methods. So we then went on and selected 250 of these unidentified samples to investigate further. When we examined these virus strains with gene sequencing, we found that most were common serotypes. However, in the remaining 20 percent of samples we were able to identify novel genotypes of rotavirus and one of these had not previously been detected.

In the other article in Emerging Infectious Diseases, the researchers were also working to identify common types of rotaviruses in Bangladesh. In their study, they found that a common type of rotavirus that had not been seen for a number of years was increasing in prevalence again and reappearing in children. Various researchers have described this as a reemergence of a common serotype.

[Ted Pestorious] So what can people do to protect children from rotavirus infection here in the United States or abroad?

[Jon Gentsch] Two new vaccines have recently been licensed in the last two years for use in the United States and around the world. These are designed to protect children from rotavirus disease and are now being routinely administered to children here in the United States early during the first year of life.

[Ted Pestorious] Some aspects of the viruses that change and mutate can escape the immune system. Is this an issue for vaccine development?

[Jon Gentsch] Well, Ted, rotavirus is a segmented virus so it is capable of changing serotypes rapidly through a process called reassortment. Vaccine developers used several serotypes to cover most of the common reassortants that had been seen. A second vaccine used one common serotype to provide broad protection against multiple common serotypes. Although there are five common serotypes of rotavirus, there are more than 50 different combinations of serotypes and we do not know if rotavirus vaccines will provide cross-protection against these other serotypes, although we believe they will.

[Ted Pestorious] So what is the public health importance of these studies?

[Jon Gentsch] Well, we know from the vaccine trials conducted by the manufacturers that rotavirus vaccines will protect against the common serotypes very effectively. However, we do not know if any of the rare or emerging serotypes could conceivably escape the immunity provided by the vaccine. Thus, we need to continue to monitor and identify these emerging strains of rotavirus.

[Ted Pestorious] Our discussion with Dr. Jon Gentsch was prompted by articles in the January 2009 issue of Emerging Infectious Diseases. These articles and others on emerging bacterial and viral diseases can be read online at www.cdc.gov/eid. Again, that's www.cdc.gov/eid. And you can submit your comments on this interview to eideditor@cdc.gov. That's eideditor—all one word— at cdc.gov. For Emerging Infectious Diseases, thanks for listening.

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