

# Flu Resistance to Antiviral Drug in North Carolina

*[Announcer] This program is presented by the Centers for Disease Control and Prevention.*

[Maureen Marshall] Hi, I'm Maureen Marshall and today I'm talking with Dr. Katrina Sleeman, Associate Service Fellow at CDC. Our conversation is based on her paper about flu resistance to an antiviral drug, which appears in CDC's journal, Emerging Infectious Diseases. Welcome Dr. Sleeman.

[Katrina Sleeman] Hello, Maureen and thank you for inviting me to discuss my paper.

[Maureen Marshall] Dr. Sleeman, please tell us what antiviral drugs are and how flu viruses can become resistant to them.

[Katrina Sleeman] Antiviral drugs are medications used to prevent and treat infections caused by viruses. In the case of flu viruses, there are two antivirals that are licensed by the Food and Drug Administration for the treatment of flu infections in people. The anti-flu medications are called the M2 inhibitors and the neuraminidase inhibitors. Because of the widespread resistance to the M2 class of drugs, the two neuraminidase inhibitors, Tamiflu and Relenza, are now the most commonly prescribed anti-flu medications. Whenever a patient is treated with an antiviral medication, there is a possibility that a drug-resistant form of the virus may emerge. This means that the medication loses its ability to fight infection. This is considered to be an acquired resistance. And, in addition to acquired resistance, flu viruses are always undergoing genetic changes naturally and resistance to drugs can also occur in this way.

[Maureen Marshall] What was occurring that made you decide to do this study?

[Katrina Sleeman] We found a group of type B flu viruses all from the same state that had abnormal antiviral resistance tests against Tamiflu. It is unusual to find Tamiflu resistance in surveillance, especially for B viruses, so we wanted to evaluate these viruses further.

[Maureen Marshall] What did you find?

[Katrina Sleeman] Our study showed that in the 2010 to 2011 influenza season, 22 percent of the B viruses collected in North Carolina had a newly discovered mutation in one of its gene's. None of the patients infected with these viruses had taken Tamiflu, so the mutation had occurred naturally and was not due to drug use and appeared to be circulating in the community together with the viruses without the mutation. Laboratory testing indicated that this mutation made these viruses less sensitive to Tamiflu. This mutation led to a change in the structure of the protein on the surface of the virus, replacing one amino acid, isoleucine, with a different one, valine. This change occurred in a region of the viral protein that is targeted by Tamiflu, making these viruses less sensitive to this drug.

[Maureen Marshall] What does this mean for people who get the flu in North Carolina?

[Katrina Sleeman] People who get sick with flu in North Carolina do not need to be worried. Based on laboratory testing, the mutated viruses showed only a modest reduction in drug sensitivity and most of the B viruses did not have the mutation. At this time, the information is insufficient to conclude whether Tamiflu would work less effectively against these mutated viruses in people. It is important to note that laboratory testing showed that these viruses were

sensitive to the second FDA-approved medication, Relenza. We will be monitoring influenza B viruses closely this coming flu season to see if viruses with this mutation are circulating.

[Maureen Marshall] How can people protect themselves from the flu in the first place?

[Katrina Sleeman] Fortunately there is a vaccine available to help prevent getting the flu and this vaccine is effective against the B viruses with the mutation. In addition to vaccination, remember to cover your mouth when you cough and your nose when you sneeze, wash your hands often, and stay home from school or work when you are ill.

[Maureen Marshall] Thanks, Dr. Sleeman. I've been talking with Dr. Katrina Sleeman about her paper, *Influenza B Virus with Mutation in the Neuraminidase Active Site, North Carolina, USA, 2010-11*, which appears in the November 2011 issue of CDC's journal, Emerging Infectious Diseases. You can see the entire article online at [www.cdc.gov/eid](http://www.cdc.gov/eid).

If you'd like to comment on this podcast, send an email to [eideditor@cdc.gov](mailto:eideditor@cdc.gov). That's e-i-d-editor - one word - at c-d-c-dot-gov. I'm Maureen Marshall, for Emerging Infectious Diseases.

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