

***Clostridium difficile* in Humans and Food Animals**

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[Dan Rutz] I'm Dan Rutz, with Dr. Michael Jhung, medical epidemiologist in the Centers for Disease Control and Prevention's Division of Healthcare Quality Promotion. We're here to talk about his study in the July 2008 issue of the CDC journal, Emerging Infectious Diseases. The study is about a drug-resistant germ that's found in both people and animals.

So, Michael, your group works on germs that are resistant to some antibiotics. This study is about a particular bacterium called *Clostridium difficile*. Tell us a bit about it, please.

[Dr. Jhung] Well, Dan, *Clostridium difficile*, or *C. difficile* as we often call it, is a bacterium that causes diarrhea and sometimes more serious intestinal illnesses. It commonly occurs in hospitals and other healthcare settings, like nursing homes. Traditionally, this infection has been associated with the use of antibiotics which somehow alter the balance of the healthy bacteria in the large intestine, allowing *C. difficile* to flourish. In recent years, we've seen illnesses from *C. difficile* both increasing in number and getting more severe, including among some people outside healthcare settings and in some people who have not been exposed to antibiotics.

[Dan Rutz] Now what was the point of the study? What did you set out to determine?

[Dr. Jhung] There are many different varieties or strains of *C. difficile* and, for this study, we wanted to look at a strain we haven't seen much of until very recently in humans so we don't know very much about it. We were hoping in our study to learn a little bit more about the strain, whether it might be increasing in prevalence, and to learn a little bit about how people get it.

[Dan Rutz] So how did you go about finding out?

[Dr. Jhung] Well, we started by looking at roughly 6,000 samples that were collected during the 1980s and 1990s by a laboratory of one of our collaborators. We then looked at about 600 samples that had been sent to CDC from healthcare facilities and health departments between 2001 and 2007. Most of the samples in both the older and more recent group were collected from hospitalized patients. Then we compared the frequency of infections with this strain of *C. difficile* in both groups.

[Dan Rutz] So, what did you come up with? What'd you find?

[Dr. Jhung] Well, it was really interesting because we found only seven cases of this more severe strain of *C. difficile* out of the roughly 6,000 older samples we looked at. But when we looked at the years from 2001 to 2007 in a much smaller number of samples, we found eight cases of this severe strain. So we're seeing significantly more cases of this strain in recent years.

Among the recent cases, nearly all had received antibiotics before their infection with *C. difficile*, and a little more than a third had not been in the hospital or healthcare setting. So we think they may have acquired their infections from the community.

[Dan Rutz] So why do you think this particular strain could be increasing?

[Dr. Jhung] Well, we don't know for sure, but we were especially interested in the possibility that this increase could be related to food animals. We had heard reports from another of our collaborators that there were widespread outbreaks of this strain in food animals, particularly pigs, since the early part of this decade. We did a number of tests and found that the isolates from animals in our study were very similar to those found in humans. This suggests several possibilities. First, humans and animals could be getting *C. difficile* from a common source in the environment. Second, humans could be getting it from contact with infected animals. Third, animals could be contracting the disease from humans. And finally, human disease could be linked to consumption of contaminated meat from these food animals. We think that spread from animals to humans is more likely than transmission from humans to animals or from an environmental source because we found human disease due to this strain increased after we noticed reports of fairly widespread disease and colonization in animals.

[Dan Rutz] OK, so what is CDC going to be able to do about the problem and what's next in terms of their research on *C. difficile*?

[Dr. Jhung] Well, first, we need to put these findings in context. If animal-to-human transmission is occurring, we think it is responsible for a very small part of all human cases of *C. difficile* infection. Now, more than 80 percent of all *C. difficile* infections are related to a healthcare setting. Therefore, we are working hard to discourage unnecessary use of antibiotics and preventing transmission through improved infection control practice. However, since animal-to-human transmission is a possibility, we are working to examine the risk of animal-to-human transmission and what could be done to reduce that risk.

[Dan Rutz] Thank you, Michael, for taking time to speak with us about this important topic and article.

With us, Michael Jhung, a medical epidemiologist at CDC, talking about his study in the July 2008 issue of CDC's journal, Emerging Infectious Diseases. You can see the whole article online at www.cdc.gov/eid. Again, that's www.cdc.gov/eid.

And if you'd like to comment on our podcast, send us a line via email at eideditor, that's one word, at cdc.gov; again eideditor, one word, at cdc.gov (eideditor@cdc.gov). We thank you for listening. I'm Dan Rutz.

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