MRSA Now Jumps Between Pets and People

BY KERRI WACHTER
Senior Writer

WASHINGTON — As if there weren't already enough reasons to be worried about methicillin-resistant *Staphylococcus aureus,* the troublesome organism is now turning up in the pet population and appears to be able to move readily between animals and humans, a veterinary expert said at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

"Methicillin-resistant *Staphylococcus aureus,* and *Staph aureus* in general, really hasn't been considered to be zoonotic, but now we're seeing that it can be transmitted between animals and people in both directions. As community-associated MRSA becomes more of a problem in people, it creates more potential exposure of pets," said J. Scott Weese, D.V.M., a professor of large animal medicine at the University of Guelph in Ontario, Canada.

Methicillin-resistant *Staphylococcus aureus* (MRSA) appears to be endemic at a low level in the horse population worldwide, and it can be transmitted between horses and people fairly readily. During an equine outbreak in Ontario between 2000 and 2002, MRSA was isolated from 79 horses and 29 horse personnel. In addition, there were 13 clinical infections in horses and 1 clinical infection in a veterinarian.

"So there was fairly clear interspecies transmission," Dr. Weese said. In fact, the outbreak was traced back to one individual.

To determine what was going on in the larger equine community, Dr. Weese and his colleagues performed a study using a convenience-based sample of 972 horses and 107 horse personnel in Ontario and New York. Nasal swabs were collected from horses and humans. Approximately 5% of horses—all of them on farms with previous MRSA exposures—and 13% of personnel were colonized with MRSA. "On every farm that had a colonized horse, there was at least one person who was colonized with an indistinguishable strain," Dr. Weese said.

"I think the household pet issue is a more concerning issue because of the degree of contact that we have with our pets in most situations," he said.

In the past year or two, there have been reports of a few hundred clinically infected pets in the United Kingdom. The numbers are lower in North America, but this may be attributable to lower rates of diagnosis and reporting. "We definitely do see them in North America."

However, the prevalence of colonization in pets in the general population appears to be very low. "Most of the reports of household MRSA report strains that are typical of the common human strains in the area," he said. The USA 100 strain is predominant in the United States and Canada.

Dr. Weese presented a few cases of transmission of MRSA between pets and humans that he has investigated. "These are not the worst of the worst. … They are representative of a lot of situations that we've investigated," he said.

Of primary concern is the duration and intensity of contact between household pets and their owners, because transmission is facilitated.

In one case in Washington, two kittens were brought to a veterinary clinic with chronic rhinitis. MRSA was isolated from cultures taken from both kittens. A technician at the clinic who had worked with the kittens was colonized as well. The kittens' owners, as well as the other cat in the household, were also colonized. Upon investigation, the researchers learned that the kittens had been adopted from a rescue facility, and the head of the rescue facility was colonized, too. The isolates collected in the course of the investigation were indistinguishable.

The MRSA originated at the rescue facility and "one or more of the kittens brought it into the house, transmitted it to both owners and the other cat and one person at the veterinary clinic," Dr. Weese said at the meeting, sponsored by the American Society for Microbiology.

In another case a few years ago, a dog was presented to a primary care veterinary clinic in New York for a postoperative infection related to a surgery performed at another facility the previous week. The culture was positive for a very aggressive strain of MRSA. The dog had necrotizing fasciitis and osteomyelitis and had to be euthanized. During the investigation, another dog developed a serious postoperative infection. This dog was admitted for surgery after the first dog had been euthanized, so there had been no chance for direct contact.

Two personnel were found to be colonized, one of whom had been observed poking at the incision line of the second dog. The investigators determined that the first dog had acquired MRSA at the facility where surgery was performed, and had transmitted the organism to the owner and two personnel at the second facility, who then infected the other dog.

Dr. Weese and his colleagues are currently investigating the possibility of transmission from people to therapy dogs making visits to hospitals. Dogs are screened for MRSA at enrollment and are periodically rechecked. The study is ongoing, and to date, one dog has been documented to have acquired MRSA during visitation with a colonized individual. "The concern is that if the dog is colonized and seeing other patients in the hospital … what's the risk for transmission," he said.

When it comes to MRSA and potential transmission, different species have different issues, Dr. Weese said. With horses, there is concern about nasal/facial contamination, fecal contamination, and the greater potential for international movement.

With household pets—dogs, cats, and hamsters, among others—the degree, duration, and intensity of contact is the primary concern. "There's a lot of high-level contact within the household, creating the chance for transmission," he said.

As a general rule, physicians "need to know what's going on in the household with pets," he said. Find out if there are pets and how many, and if the pets are healthy. It's important to reinforce the importance of hand hygiene for people with pets, especially if the pet is sick. ■

'Alarming' Adamantane Resistance Threatens Influenza Control

BY JEFF EVANS
Senior Writer

Evidence of widespread resistance of influenza against amantadine and rimantadine has prompted calls for restraint in the use of antivirals in order to preserve the therapeutic value of these adamantanes as well as newer generation agents.

Investigators at the Centers for Disease Control and Prevention detected an "alarmingly high" resistance rate of 92% to the adamantane antiviral drugs amantadine and rimantadine in an analysis of 209 influenza A(H3N2) isolates from patients in 26 states from Oct. 1 through Dec. 31, 2005 (JAMA doi:10.1001/jama.295.8.joc60020, published Feb. 2, 2006).

An earlier CDC analysis that found adamantane resistance in 109 of 120 influenza A(H3N2) isolates from patients in 23 states from Oct. 1, 2005, through Jan. 12, 2006, led the CDC to issue a Health Alert on Jan. 14, 2006. The alert recommended that neither amantadine nor rimantadine be used for the treatment or prophylaxis of influenza A infections in the United States for the remainder of the 2005-2006 influenza season.

"If antiviral use is curtailed, susceptible strains could emerge and adamantanes could regain their utility against both epidemic and pandemic influenza," Dr. David M. Weinstock and Dr. Gianna Zuccotti of Memorial Sloan-Kettering Cancer Center, New York, wrote in an editorial (JAMA doi:10.1001/jama.295.8.jed60009, published Feb. 2, 2006).

In the report, Rick A. Bright, Ph.D., and his colleagues at the CDC noted that adamantane resistance in the United States increased from 1.9% in 2003-2004 to 11% in 2004-2005 to the current 92%. The CDC study also noted that 100% of influenza A(H3N2) isolates obtained from 10 patients in Mexico and 3 patients in Canada were resistant to amantadine and rimantadine. A recent report on influenza A(H3N2) isolates from the 2005-2006 influenza season in Canada found that 43 (91%) of 47 isolates showed resistance to those drugs.

The CDC report "is a clarion call for action from the medical community," the editorial said. "Physicians and other health care professionals must (1) educate patients and communities; (2) organize an international response through governmental and nongovernmental organizations; (3) advocate against the release of over-the-counter antiviral drugs, either directly by major drug companies or through licensing agreements with generic manufacturers; and (4) recognize the powerful influences that affect prescribing practices before assigning culpability to those who have inappropriately used adamantanes."

In a related report that appeared just before the CDC report, a systematic review of 52 randomized, controlled trials of the adamantane drugs and the newer generation neuraminidase inhibitors oseltamivir (Tamiflu) and zanamivir (Relenza) also raised serious doubts about the wisdom of using the four drugs for routine control of seasonal influenza.

Amantadine and rimantadine neither prevent infection nor affect viral shedding. And even though they shorten the duration of fever, the drugs also have potentially serious adverse effects and promote the rapid emergence of resistant strains. "The evidence does not support" their use for seasonal or pandemic influenza outbreaks, reported Dr. Tom Jefferson of Cochrane Vaccines Field, Alessandria, Italy, and his associates.

Zanamivir and oseltamivir also should not be used routinely for seasonal influenza. They did not prevent infection with influenzalike illness nor interrupt nasal shedding of virus, but they may have a role in limiting symptoms and complications in affected patients, the researchers said (Lancet doi:10.1016/S0140-6736(06)67970-1, published Jan. 19, 2006).

Resistance to oseltamivir therapy among adults infected with influenza A(H1N1) or influenza A(H3N2) virus has been rare, but resistant strains have been reported in up to 18% of Japanese children receiving oseltamivir, Dr. Weinstock and Dr. Zuccotti noted in their editorial.

Zanamivir and oseltamivir should be used only "in a serious epidemic or pandemic alongside other public-health measures such as [the] use of masks, gowns, gloves, quarantine, and handwashing," Dr. Jefferson said in a statement.

The investigators drew their conclusions from a review of 52 trials of either prevention or treatment of influenzalike illness involving otherwise healthy subjects aged 16-65 years. In addition to the above-mentioned results, "we could find no credible evidence of the effects of neuraminidase inhibitors on avian influenza," they noted.

The cautions against using these four antivirals are particularly important to note, given that last year the World Health Organization "encouraged member countries to use antivirals" before a pandemic does develop. ■

Contributing writer Mary Ann Moon contributed to this report.