Household Pets Can Harbor and Transmit MRSA

Interspecies transmission has been documented, but MRSA colonization in pets remains uncommon.

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. They collected nasal swabs 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.

"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."

Physicians must inquire about their patients' pets and whether they are healthy, and they should emphasize hand hygiene, especially if pets are sick.

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.

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, which was 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.

It's also important to consider pets in the household if a patient has an otherwise unexplained MRSA infection or recurrent, persistent infections. "Infection control measures are the key" to prevent household transmission of MRSA between pets and people, Dr. Weese said. Animals appear to eradicate MRSA colonizations on their own in most situations, he noted. ■

Resistant Staph Often Present In Long-Term Care Centers

WASHINGTON — The percentage of *Staphylococcus aureus* isolates resistant to methicillin was about 68% in a survey of more than 100 long-term care facilities, Susan Beekmann, R.N., M.P.H., reported in a poster presented at the annual Interscience Conference on Antimicrobial Agents and Chemotherapy.

This "extraordinarily high" rate was higher than the documented MRSA rates from surveys of acute care hospitals nationwide, noted Ms. Beekmann and her colleagues at the University of Iowa, Iowa City.

The multicenter, longitudinal surveillance study included 1,060 *S. aureus* and 1,979 *Enterococcus* isolates collected from long-term care facilities across the United States during three 1-year periods from 1999 to 2004, Dr. Beekmann reported. The *S. aureus* isolates included 325 skin or soft tissue specimens, 489 urine specimens, and 246 other specimens. The *Enterococcus* isolates included 81 skin or soft tissue specimens, 1,835 urine specimens, and 63 other specimens.

The MRSA rate remained fairly stable (66%-71%) throughout the study period. By contrast, the overall infection rate of vancomycin-resistant enterococcus was relatively low (5%), and ranged from 4% in 1999 to 7% in 2003. No evidence of VRE was found in any of the skin or soft tissue isolates, the investigators noted.

Only five MRSA isolates showed no coresistances to other antibiotics. An additional 22 were resistant to ciprofloxacin only; these 22 were also susceptible to clindamycin. Only two of the *Enterococcus* isolates were linezolid resistant, and eight were intermediate resistant to linezolid, whereas none of the *S. aureus* isolates was resistant to linezolid.

The meeting was sponsored by the American Society for Microbiology.

—Heidi Splete

Shunts, Chills, MRSA History Can Flag Bacteremic Patients

WASHINGTON — Three clinical characteristics—arteriovenous shunts or grafts, history of methicillin-resistant *Staphylococcus aureus*, and the presence of chills—were significantly associated with *S. aureus* bacteremia in a study of 1,015 patients, Dr. Zeina A. Kanafani reported in a poster presented at the annual meeting of the Interscience Conference on Antimicrobial Agents and Chemotherapy.

The findings may facilitate earlier detection of infection and encourage the timely initiation of antibiotics in bacteremic patients, noted Dr. Kanafani and her colleagues at Duke University Medical Center in Durham, N.C.

Data were collected from hospitalized patients aged 18 years and older with fevers of at least 38° C who underwent blood cultures between December 2003 and December 2004. A total of 235 patients (23%) had positive blood cultures; 76 were excluded from the study due to possible culture contamination.

Of the remaining 159 patients (7.7% of the original patient population), 78 had *S. aureus* bacteremia; the other 81 patients grew organisms including *Candida* species, *Enterococcus* species, and *Bacteroides* species.

Overall, 15 (19%) of patients with *S. aureus* bacteremia had histories of *S. aureus* infection, compared with 42 (5%) of the 780 patients whose blood cultures were negative for bacteremia. In addition, 25 (32%) of bacteremia patients had an arteriovenous shunt or graft, compared with 74 (10%) of culture-negative patients, and 34 (44%) of bacteremia patients suffered from chills, compared with 126 (16%) of the culture-negative patients.

In a subgroup of 829 nonhemodialysis patients, 45 (5%) had *S. aureus* bacteremia, and these patients were significantly more likely to have a tunneled-cuff catheter and a history of methicillin-resistant *S. aureus*.

The meeting was sponsored by the American Society for Microbiology.

—Heidi Splete