



Methicillin-resistant Staphylococcus aureus (MRSA) Infections in Animals

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MRSA is a microorganism that is a type of bacteria. This staphylococcus bacterium has acquired a gene, which basically enables the organism to be resistant to a significant group of antibiotics that includes penicillin, cephalosporin and the semi-synthetic penicillins (methicillin, oxacillin or cloxacillin). **MRSA is primarily a human disease issue**, but recently there has been increased public interest in MRSA, because of its zoonotic potential (transmission from vertebrate animals to humans).

A MRSA infection is typically a nosocomial (pertaining to or originating in the hospital) infection or occurring among people who have recently been in the hospital or some other type of health care facility. MRSA infections were thought to be exclusively health care-associated until the 1990s when an increasing number of people with MRSA infection were identified that had no history of working or receiving care in a medical setting. These staphylococcus infections are called community-associated methicillin resistant *Staphylococcus aureus* (CA-MRSA) infections. CA-MRSA occurs in healthy people who have not been in the hospital or had any type of invasive medical procedures (for example- surgery, dialysis or catheters) within the past year. The CA-MRSA infections typically are skin and soft tissue lesions such as abscesses. The CA-MRSA strains are thought to be genetically distinct from the hospital-associated MRSA.

Person-to-Person Transmission

People often have MRSA without showing any signs of illness. This is referred to as "colonized." MRSA colonization occurs in the nose or on the skin. If a person has a MRSA infection, signs of illness such as fever and skin redness, swelling, drainage or pain are present. The spread of MRSA occurs either by direct contact with colonized or infected people or by indirect contact with surfaces or objects that were previously contaminated by a colonized or infected individual. The MRSA bacteria can live on unclean surfaces for many hours, sometimes days. MRSA can live and multiply on hands that have not been washed, just like many other kinds of bacteria.

Animals in the Transmission Cycle

Since *Staphylococcus aureus* bacteria are primarily adapted to living on humans, animals are most likely to contact MRSA by having direct or indirect contact with persons who are



colonized or infected with MRSA. Once infected or colonized, animals may then serve as reservoirs (sources) for bacteria transmission to other animals or people they may encounter. The significance of human to animal transmission may vary with the species of animal. There are some strains of MRSA that can apparently be transmitted between horses, but most pet (dog and cat) infections are thought to be acquired from humans. Species reported to have been infected with MRSA include horses, dogs, cats, cattle, sheep, rabbits, and a single incident with a parrot.

Clinical Signs in Animals

The community-associated MRSA infections that occur in otherwise healthy people are usually skin infections such as abscesses, boils, and other types of pus-filled sores. Initially the infection may look like a spider bite. Animals infected with this type of MRSA will also usually have some type of wound or skin infection. However, it is also possible to have MRSA invade the joints, bones, lungs, or bloodstream leading to more severe disease. To definitively diagnose MRSA, your veterinarian will need to take a sample or swab of the affected

skin, wound or tissue and submit this sample to a bacteriology lab for culture and antimicrobial sensitivity tests.

Treatment

The recommended treatment for an animal infected with MRSA will vary according to where the infection occurs, the laboratory test results and the overall health of the animal. MRSA skin infections in an animal may require surgical removal of the infected tissue, along with keeping the wound covered and clean. If an antibiotic is used in the treatment, it will be prescribed according to the culture and sensitivity results from the bacteriology lab. If you are treating a MRSA-infected animal at home under the supervision of your veterinarian, it is important to take steps to protect yourself and your family. In most instances, caring for an animal found to be infected with MRSA will not pose a significant health risk to the family, but if anyone in the household has recently had surgery, is undergoing treatment for cancer, has HIV/AIDS, or has any medical condition that severely suppresses the immune system, consultation with your physician is strongly advised. In rare cases, it may be necessary to isolate the animal away from the home until treatment is completed and follow up bacterial cultures test negative for MRSA. The Oklahoma State Department of Health recommends you take the following precautions:

- Wear disposable gloves when treating open wounds and changing bandages.
- Use a household disinfectant or chlorine bleach solution (2 teaspoons bleach mixed with one quart of water) to clean and wipe any hard surfaces contaminated by wound drainage.
- Avoid touching your nose, eyes, face, and mouth when caring for your animal or cleaning the surrounding area.
- Clean an animal's bedding or other surroundings that may be soiled with pus, infected fluids, or other discharges.

- **Practice good hand hygiene.** All persons in the household should wash their hands frequently with soap and warm water, or use an alcohol-based hand sanitizer, especially after changing an infected animal's bandage or touching affected areas of the animal's body.
- Wash all towels, blankets, or other cloth items that were in contact with an infected animal in hot water and laundry detergent. Drying laundry in a hot dryer also helps to kill MRSA bacteria.

Screening Animals for MRSA Colonization

If a person suffers with reoccurring MRSA infections and a pet(s) lives in the home, screening the pet(s) in conjunction with all other persons in the household may be advised. Animals can serve as reservoirs for transmission to people, but it is more likely that asymptomatic persons are a source of MRSA. To screen an animal for MRSA colonization, a veterinarian will swab the nasal and rectal areas and submit the swabs to a laboratory for culture and antibiotic sensitivity testing. It is important to coordinate this testing with the physician performing similar screening on all humans in the household and share test results.

If a pet is found to be colonized with MRSA, owners may want to treat the pet. Currently, there isn't any established antibiotic treatment or protocol for treating a MRSA-colonized animal that is reliably effective. Because most animals will clear the MRSA colonization spontaneously within a few weeks if they are protected from re-infection, temporarily isolating the animal from contact with the infected person should be satisfactory. This may require temporary boarding or placement in another location, such as a kennel or veterinary clinic.

For more information on MRSA, contact the Oklahoma State Department of Health at (405) 271-4060 or www.health.ok.gov or the Centers for Disease Control and Prevention website at http://www.cdc.gov/ncidod/dhqp/ar_mrsa.html.

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