



NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
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Commissioner

2022 Veterinary Alert # 4

***Streptococcus equi* subspecies *zooepidemicus* Identified in Shelter Dogs**

- **An outbreak of canine infectious respiratory disease complex (CIRDC) is occurring among dogs at the Manhattan Animal Care Center since May 2, 2022**
- **8 dogs have been diagnosed with pneumonia; *Streptococcus equi* subspecies *zooepidemicus* was detected by PCR in 4 of these dogs as well as canine respiratory corona virus and pneumovirus**
- ***Streptococcus equi* subspecies *zooepidemicus* is a rare pathogen in dogs and typically limited to shelter settings**
- **Unpublished observations suggest transmission of *Streptococcus equi* subspecies *zooepidemicus* from shelter dogs to other dogs following adoption or transfer is unlikely**
- **Information on diagnostic testing is provided here for New York City veterinarians who have suspect cases (dogs with compatible symptoms that have recently been released from shelters or have had contact with shelter dogs)**

Please share with your colleagues in Veterinary Medicine and your staff

May 13, 2022

Dear Veterinary Colleagues,

New York City Animal Care Centers are alerting NYC veterinarians of an outbreak of canine infectious respiratory disease complex (CIRDC) occurring among dogs at the Manhattan Animal Care Center (ACC) since May 2, 2022. *Streptococcus equi* subspecies *zooepidemicus* (*S. epidemicus*) was detected by PCR in 4 of 8 dogs diagnosed with pneumonia. These 4 dogs all likely had mixed infections as PCR also detected canine respiratory corona virus and pneumovirus. Two of the dogs died.

S. epidemicus although uncommon in dogs, has been reported in the literature in association with outbreaks of severe pneumonia in dogs in kennel settings.¹²³

The bacterium is most commonly identified in horses as a commensal organism of the respiratory tract which sometimes invades opportunistically. In dogs, it is a causative agent of

hemorrhagic pneumonia. Clinical signs may include moist cough, depression, anorexia, fever, dyspnea, nasal discharge, hematemesis or hematuria.^{1,2} Occasionally septicemia and acute death have been reported.⁴ The epidemiology of this organism in dogs is not well understood, and the source of infection and mechanism of transmission to dogs is not definitively known.

It is important to note that this is a pathogen that has been associated with kennel type settings and *NOT* thought to be commonly isolated from household pets with respiratory illness. Research comparing isolation of *S. epidemicus* in a population of kennel dogs (n=209) vs household pets (n=71) with respiratory illness revealed the bacteria in 24% of kennel dogs and only 1.4% of household pets.³ The kennel dogs sampled included healthy dogs and dogs exhibiting signs of respiratory illness. Sick animals were more likely to have *S. epidemicus* isolated than healthy dogs in the same kennel. While presence of the organism did not correlate with age or clinical condition of the dogs upon entry to the shelter, isolates were more likely to be found in dogs with more severe respiratory illness.

According to Chalker et al, *S. epidemicus* has more commonly been associated with more severe cases of canine infectious respiratory disease suggesting it may opportunistically invade the respiratory tract following other pathogens.³ Although it may play a primary role based on limited data indicate that *S. epidemicus* is capable of causing severe respiratory disease, with or without other pathogens, under certain circumstances.

While it is unlikely that you will see a patient with *S. epidemicus* in your facility, you may consider it in dogs presenting with clinical signs of canine infectious respiratory disease complex (CIRDC) (sneezing, nasal and ocular discharge, and lower respiratory and/or systemic disease) and were recently adopted from ACC, or in contact with a dog that was recently adopted from ACC.

Routine bloodwork is unlikely to aid substantially in the diagnosis but may reflect underlying conditions or hematologic abnormalities resulting from the infection. Laboratory values reported in the literature include a leukopenia with monocytosis and normal serum chemistry.² Thoracic radiographs may reveal increased pulmonary opacity from bilateral alveolar infiltration, typically represented by air bronchograms and air alveograms, particularly in the cranial lobes.² If you suspect a case in your facility, the dog should be isolated and stringent biosecurity measures initiated immediately.

Necropsies performed on affected dogs have identified hemothorax and hemorrhagic frothy fluid in the nasal cavity, trachea or bronchial airways. Diffuse hemorrhage and consolidation of the lungs may be seen as well a rubbery appearance, inability to collapse and a mottled dark to bright red coloring.^{1,2}

S. epidemicus is diagnosed by PCR and by culture. Nasal and oropharyngeal swabs can be collected for PCR, while samples submitted for culture should be obtained by performing a tracheal wash or bronchial alveolar lavage (BAL). In dogs that have died or been euthanized as

a result of illness, lung tissue should be collected and submitted for bacterial culture and sensitivity. Additional samples should be collected for further testing to identify other respiratory pathogens, such as canine influenza virus or *Bordetella bronchiseptica*. Testing is offered at the Cornell University Animal Health Diagnostic Center. For more information on appropriate specimens and submission call the AHDC at 607-253-3900.

The treatment protocol recommended by Kim et al included IV LRS at 75ml/kg/day and combined preparation of 40,000 IU of penicillin and 20mg/kg of streptomycin IM q 12 hours.² Anecdotal reports of shelter outbreaks suggest that Procaine penicillin G (PPG) is a highly effective treatment as well (10,000-20,000 IU/kg q 12 hours for 7 days). Prompt recognition of cases and early initiation of therapy seems to be critical for a successful outcome in *S. epidemicus* cases. Supportive care should be provided as needed. Carriers are thought to be unlikely following treatment. Unpublished observations from other facilities suggest that transmission of *S. epidemicus* from shelter dogs to other dogs following adoption or transfer to a rescue group is unlikely although the possibility exists.

The dogs in the shelter were started on antibiotic therapy and infection control measures heightened. No other dogs have died since.

Although rare, zoonotic transmission of *S. epidemicus* to humans has been documented, resulting in pharyngitis, glomerulonephritis, meningitis and pneumonia.⁵ The transmission route has been consumption of unpasteurized dairy products from infected cows. To our knowledge, only three cases have been linked to possible contact with an infected dog. People at risk include severely immunocompromised individuals.

As always, we greatly appreciate your partnership and cooperation.

Zoonotic and Vectorborne Disease
Bureau of Communicable Disease

¹ Pesavento et al. A clonal outbreak of acute fatal hemorrhagic pneumonia in intensively housed (shelter) dogs caused by *Streptococcus equi* subsp. *zoepidemicus*. 2008. Vet Pathol 45:51-53.

² Kim et al. Outbreak and control of haemorrhagic pneumonia due to *Streptococcus equi* subsp. *zoepidemicus* in dogs. Vet Record 2007. 161, 528-530.

³ Chalker et al. The association of *Streptococcus equi* subsp. *zoepidemicus* with canine infectious respiratory disease. Vet Micro. 2003. 95;149-156.

⁴ Greene. Streptococcal and other gram-positive bacterial infections. In Infectious Diseases of the Dog and Cat. 3rd edn. Eds. C. E. Greene, J. F. Prescott. Philadelphia, Saunders. Pp 302-316.

⁵ Balter et. al. 2000. Epidemic nephritis in Nova Serrana, Brazil. Lancet 355, 1776-1780.

⁶ Zahlani Y, et. al. Possible canine source of *Streptococcus equi* subspecies *zoepidemicus* causing meningitis in an infant. ID Cases. 2019;17:e00568. Published 2019 May 31. doi:10.1016/j.idcr.2019.e00568

⁷ Abbott Y., Acke E., Khan S. Zoonotic transmission of *Streptococcus equi* subsp. *zoepidemicus* from a dog to a handler. J Med Microbiol. 2010;59(Pt 1):120-123.

⁸ Ghoneim A.T., Cooke E.M. Serious infection caused by group C streptococci. J Clin Pathol. 1980;33(2):188-190.

⁹ Priestnall, S., & Erles, K. (2011). *Streptococcus zoepidemicus*: an emerging canine pathogen. Veterinary journal (London, England : 1997), 188(2), 142-148. <https://doi.org/10.1016/j.tvjl.2010.04.028>

¹⁰ <https://www.maddiesfund.org/strep-zoo.htm>

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