Pennsylvania Game Commission Wildlife Disease Reference Library

Ehrlichiosis

Cause

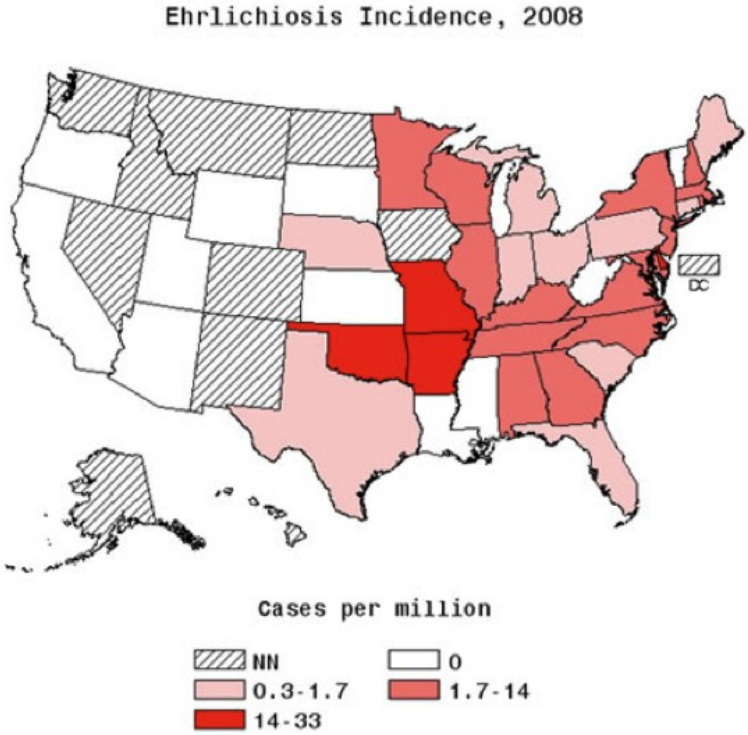
Ehrlichiosis is a tick-borne disease of mammals caused by multiple species of bacteria in the group called *Ehrlichia*, which infect white blood cells. This disease has been recognized in domestic animals since the 1930's and it was first reported in humans in 1954. Ehrlichiosis is considered an emerging infectious disease because there has been an increase in its occurrence.

Significance

Humans can become infected with erhlichiosis from the bite of a tick carrying the bacteria, and from blood transfusions or organ transplants that harbor the bacteria. People can become severely ill and if not treated properly may die from this disease.

Species Affected

Many mammal species are susceptible to ehrlichiosis. Wildlife hosts include, but are not limited to, white-tailed deer, wolves, coyotes, foxes, voles, raccoons, and opossums. White-tailed deer are known to be reservoirs for one of the *Ehrlichia* species responsible for causing disease in humans. Domestic animals known to be infected with ehrlichiosis include dogs, cattle, sheep, goats, horses, and rarely cats.



Incidence of human cases (per million population) of ehrlichiosis for the United States in 2008. Courtesy of www.cdc.gov

Distribution

Ehrlichiosis has been reported in the United States, Europe, Africa, the Middle East, and Asia. Ticks carrying *Ehrlichia* have been found on migratory birds, so birds may be responsible for the dispersal of the bacteria over long distances during migration. The majority of human cases of ehrlichiosis in the United States occur in the southeast and south-central parts of the country. This distribution corresponds with the home range of the lonestar tick, which is responsible for transmission of the bacteria in most human cases. Most cases occur in the summer when ticks are active. No cases of this disease have been documented in Pennsylvania wildlife.

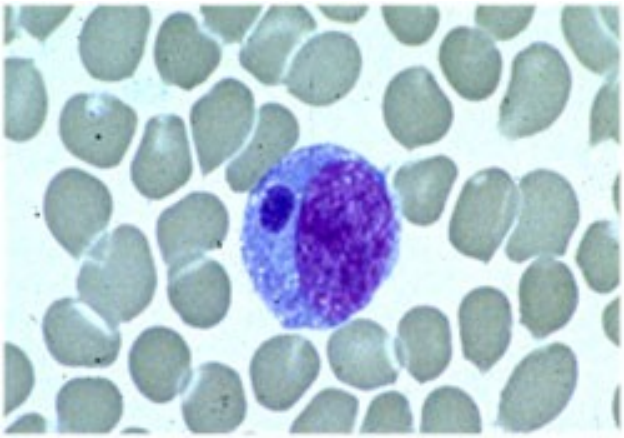
Transmission

Ehrlichiosis is transmitted through the bite of a tick that is carrying the bacteria. The tick picks up the bacteria when it bites an infected animal and transmits the disease when it bites a second uninfected animal. Biting flies may also play a role in the transmission of this bacteria. The bacteria can also be transmitted in blood transfusions and organ transplants. A bird bander in NJ was infected with *Ehrlichia* from the bite of a tick migrating with a bird, and later died of this disease.

Clinical Signs

The incubation period for ehrlichiosis is usually 7-21 days; this is about how long it takes for infected animals to start showing clinical signs. *Ehrlichia* bacteria target white blood cells, so infected animals often have a decreased white blood cell count and may also have a decreased number of immature red blood cells. Clinical signs include fever, depression and loss of appetite. The spleen is often enlarged.

Clinical signs of ehrlichiosis are rarely observed in free-ranging wildlife, but have been observed in captive wildlife. White-tailed deer are considered reservoirs that carry the bacteria.



Ehrlichia in a white blood cell, courtesy of www.cdc.gov

Diagnosis

Several laboratory tests are used to diagnose ehrlichiosis. Special stains are used to observe the bacteria within white blood cells under a microscope, but further laboratory tests must be conducted to confirm the diagnosis.

Treatment

Treatment in free-ranging wild animals is not feasible, but antibiotics may be used to treat captive wildlife.

Management/Prevention

Ehrlichiosis prevention is focused on tick control in humans and domestic animals. Tick control in free-ranging wildlife is not feasible and probably not necessary as this disease is not known to cause clinical illness in wildlife. Wildlife populations are not known to be negatively impacted by ehrlichiosis, but they may play important roles as reservoirs for the disease in humans and domestic animals.

People should wear long pants and long sleeves when outside in potential tick habitats. Ticks should be promptly removed if found on people or pets. Domestic animals can introduce ticks to their owners and can themselves become infected with ehrlichiosis. Tick prevention is important to protect humans and domestic animals from this disease.

Suggested Reading

Bjoersdorff, A., S. Bergstrom, R. F. Massung, P. D. Haemig, and B. Olsen. 2001. *Ehrlichia*-infected ticks on migrating birds. Emerging Infectious Diseases 7: 877-879.

Centers for Disease Control and Prevention (CDC). 2011. Ehrlichiosis. <http://www.cdc.gov/ehrlichiosis/index.html>.

Ehrlichiosis and Related Infections. 2011. The Merck Veterinary Manual. <http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/57302.htm>.

Davidson, W. R., J. E. Dawson, and S. A. Ewing. 2001. Ehrlichioses. Pages 466-477 *in* E. S. Williams and I. K. Barker, editors. Infectious diseases of wild mammals. Iowa State University Press, Ames, Iowa, USA.

Tilley, L. P., and F. W. K. Smith, Jr. 2007. Blackwell's five-minute veterinary consult: canine and feline. Fourth edition. Blackwell publishing, Ames, Iowa, USA.