

## TULAREMIA: Notes about the Disease

Tularemia is a zoonotic bacterial disease caused by *Francisella tularensis*, a small Gram-negative coccobacillus once classified as a *Pasteurella* species. While it is not a common disease in North Carolina, it warrants Public Health attention as a potential bioterrorism agent because of its low ID<sub>50</sub> and transmissibility via the respiratory route.

Tularemia occurs clinically in several forms dependent to a great extent on the mode of infection. The ulceroglandular form, by far the most common, results from a tick or insect (usually deerfly) bite, cut, or scratch; organisms spread via the lymphatic system to produce a systemic febrile illness marked by regional lymphadenopathy and a papule which ulcerates at the site of inoculation. Both *Dermacentor variabilis* (American dog tick) and *Amblyoma americanum* (lone star tick) can transmit tularemia here. Occasionally in NC, one hears of a case associated with handling or skinning a wild rabbit, but most cases nowadays are tick-borne.

Other less common forms include typhoidal (septicemic), pneumonic, oculoglandular, oropharyngeal, and glandular. The pneumonic form can occur as a complication of either the ulceroglandular or typhoidal forms. Pneumonic tularemia occurs as the primary form following inhalation of viable *F. tularensis* organisms, as sometimes happens to laboratorians who become careless working with live cultures, or may occur if tularemia organisms were disseminated in an aerosol by a terrorist.

For what it is worth, *F. tularensis* arises worldwide in over 100 species of animals, birds, and insects in two different subspecies or biovars. The type A (*tularensis*) subspecies is most often associated with a maintenance cycle in nature involving lagomorphs (rabbits and hares), while the type B (*holarctica*) subspecies is usually associated with rodents. In a molecular study of 316 *F. tularensis* isolates submitted to the Centers for Disease Control and Prevention between 1964 and 2004, all four of the NC isolates were type A, as were all but two of the 20 isolates from our bordering states.<sup>1</sup> Unfortunately, type A infections tend to be more serious than those caused by type B organisms.

For tularemia prevention, the public has one more disease for which the avoidance of ticks is a worthwhile endeavor. Those of us who still hunt rabbits should use proper care in handling and butchering wild game to prevent contracting "rabbit fever," as tularemia is sometimes called. Finally, because of *F. tularensis*' potential as an agent of bioterrorism, health care workers need to be made aware of the possibility of tularemia as a cause of clustered cases of bacterial pneumonia.

1. JE Staples, et al., "Epidemiologic and Molecular Analysis of Human Tularemia, United States, 1964-2004," *Emerg Infect Dis* 12 (2006): 1113-8, [www.cdc.gov/ncidod/EID/vol12no07/pdfs/05-1504.pdf](http://www.cdc.gov/ncidod/EID/vol12no07/pdfs/05-1504.pdf).