Dog Gives Woman Fatal Tularemia, A Potential Bioterrorism Agent

By Alex Berezow, PhD — August 24, 2017

In its latest weekly report [2], the CDC details the case of a woman from Arizona who died from tularemia, a rare disease that she acquired from her dog.

Tularemia [3] is caused by the bacterium *Francisella tularensis*. Because it naturally infects rabbits and rodents, there isn't much we can do to eradicate it. Humans can become sick (with symptoms that can be flu-like) when they come into contact with an infected animal or are bitten by a tick or insect that is acting as a vector. Only about 125 Americans are diagnosed with tularemia annually.

The Arizona woman, who was 73 years old and had several other health problems (pulmonary sarcoidosis and a *Clostridium difficile* infection), was most likely infected by her dog. The dog, in turn, was infected by a rabbit carcass it was chewing on. The elderly woman had respiratory symptoms, which suggested that she contracted tularemia via aerosol, perhaps from the dog's saliva.

**Tularemia: An Agent of Bioterrorism**

Though it is a naturally occurring disease, bioterrorism analysts have long feared the deployment of tularemia as a biological weapon. Ken Alibek, a Soviet defector, claimed that the Soviets infected Nazi soldiers with tularemia in 1942, helping them win the Battle of Stalingrad.
That account, however, is hotly disputed by genetics professor Erhard Geissler. He argues, rather convincingly, that the evidence suggests that tularemia played only a very minor role in Nazi war casualties. He believes that any cases of tularemia were the result of natural infection, not biological warfare.

Still, the threat that a microbe could be weaponized to terrify soldiers and citizens is very realistic. Even if such a weapon would have a limited impact in terms of death and injury, the psychological scar upon a nation could be substantial. For whatever reason, humans find invisible microbes to be scarier than bullets and bombs. All one needs to consider is how the U.S. responded to the anthrax attacks of 2001 and the Ebola outbreak of 2014. (One research article estimated the cost of decontamination alone following the anthrax attack at $320 million.)

If a terrorist wished to weaponize tularemia, how would he go about it? There are two possibilities.

First, a terrorist could aerosolize the bacteria. A small nebulizer (a medical device that creates aerosols) could be placed in highly trafficked areas, such as a transportation hub or mall. According to one journal article, as few as 10 bacteria are sufficient to cause infection if inhaled. Left untreated, this form of tularemia would kill 30 to 60% of those it infected. Thus, aerosolization could be an efficient method of dissemination.

Second, a terrorist could infect rodents with tularemia and then release them into a city. Rodents could then spread them to other rodents, creating a large reservoir from which humans could become infected.

How Realistic Is Bioterrorism?

Realistic enough. Given that it’s already happened, we must anticipate that a terrorist will try it again, and governments should prepare for that eventuality. Intelligence analysts often classify such acts as “high impact, low probability” -- which means that a bioterrorist attack is not likely to occur, but if it does, it will be very disruptive. (Once again, the disruption is more likely to be psychological and economic rather than in terms of body count.)

As a result, public officials must always keep in the back of their minds that rare disease outbreaks may not be accidental.