Health Advisory:

Misidentification of *Veillonella* as *Francisella tularensis* by Automated Microbial Identification System

June 5, 2017

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June 5, 2017

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SUBJECT: **Misidentification of *Veillonella* as *Francisella tularensis* by Automated Microbial Identification System**

In the June 2, 2017, issue of the *Morbidity and Mortality Weekly Report* (*MMWR*), the Office of Public Health Preparedness and Response at the Centers for Disease Control and Prevention (CDC) and the Idaho Division of Public Health reported the first published case of misidentification of *Veillonella* spp. as *Francisella tularensis* (a Tier 1 select agent*) by an automated microbial identification system (AMIS). After the investigation of the initial laboratory report, it was determined that the infectious agent isolated from a nonprosthetic knee of a patient was *Veillonella* and not *F. tularensis.* This misidentification resulted in time-intensive response activities, use of prophylactic antibiotics by hospital staff members, and inappropriate targeted antibiotic therapy for the patient.

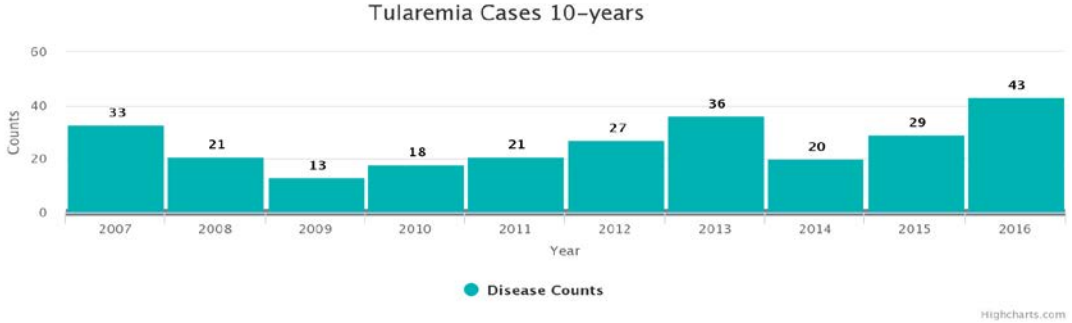
Clinical laboratories are advised **not** to use a commercial AMIS if a select agent is suspected in a clinical sample, and to consult with their Laboratory Response Network (LRN)-biologic laboratory for guidance and sample referral. Clinicians should consider *Veillonella* spp. when receiving laboratory reports of *F. tularensis* generated by AMISs. Antibiotic coverage for both *Veillonella* spp. and *F. tularensis* could be considered until final microbial identification is available.

Background

Tularemia is a disease of animals and humans caused by the bacterium *F. tularensis*. Humans can become infected through several routes, including: tick and deer fly bites, skin contact with infected animals, ingestion of contaminated water, inhalation of contaminated aerosols or agricultural dusts, laboratory exposure, and when exposed as a result of bioterrorism.

Missouri is an endemic state for tularemia infection. In 2015, the incidence of tularemia per 100,000 population in Missouri was nearly 5 times that of the United States, 0.48 and 0.1, respectively. The annual number of tularemia cases in the U.S. between 2005 and 2015 ranged from 154 to 314, and a substantial portion of those cases were reported from Missouri (Figure 1).

Figure 1. Tularemia cases, Missouri, 2007-2016



Veillonella spp. are small, slow-growing, nonmotile anaerobic Gram-negative cocci found as part of the normal flora of gastrointestinal, respiratory, and vaginal tracts. Although *Veillonella* spp. are classified as anaerobes, anaerobic organisms (including *Veillonella* spp.) have been observed growing in aerobic conditions for a limited time after isolation before becoming nonviable. Often considered contaminants of clinical specimen collection, *Veillonella* spp. have been rarely isolated from monomicrobial cultures of invasive infections. Predisposing factors for invasive infection might include local or systemic immune suppression and localized anaerobic conditions produced by tissue necrosis, diminished blood supply, or prolonged infection with aerobes.

The *MMWR* report describes a male patient aged >75 years with multi-year history of chronic unilateral knee pain requiring a series of intra-articular injections. The last injection occurred 15 days before he sought care at a hospital for a swollen knee. Gram staining of an intra-articular aspirate obtained that day from the affected knee showed Gram-variable cocci. The aspirate was cultured under aerobic and anaerobic conditions. Slow-growing colonies of Gram-negative cocci were observed from the anaerobic culture, with limited growth in aerobic conditions. Because an anaerobic AMIS panel was not available, isolates from the aerobic culture were processed for identification and antimicrobial susceptibility on the AMIS using a panel specific for aerobic organisms resulting in misidentification of *F. tularensis*.

Public health investigation determined no recent exposure by the patient to potential sources of naturally-occurring *F. tularensis*. Because of potential *F. tularensis* laboratory exposure, 19 laboratory staff members elected to start antibiotic prophylaxis while waiting for the confirmatory testing.

Using LRN real-time polymerase chain reaction methods, the Idaho Bureau of Laboratories tested the isolate for *F. tularensis* and *Brucella* spp.; no *F. tularensis* or *Brucella* spp. DNA was detected. Subsequent partial 16S ribosomal RNA (rRNA) gene sequencing identified a *Veillonella* spp. After identification of *Veillonella* spp., the patient's antibiotic regimen was changed, and personnel who were receiving prophylactic antibiotics were informed that continuation of prophylaxis was not recommended or necessary. The source of this patient's infection was not determined.

Missouri Department of Health and Senior Services (DHSS) Recommendations for Microbiology Laboratories and Healthcare Providers

- Clinical laboratories are advised not to use a commercial AMIS if a select agent is suspected in a clinical sample.
- Consult with an LRN-biologic laboratory (Missouri State Public Health Laboratory [MSPHL]) for guidance and sample referral. MSPHL can be contacted at 573-751-3334 or 800-392-0272 (24/7).
- Clinicians should consider *Veillonella* spp. when receiving laboratory reports of *F. tularensis* generated by AMISs.
- Because *Veillonella* spp. are typically resistant to recommended or alternative antibiotic therapies for tularemia (i.e., streptomycin, gentamicin, tetracyclines, ciprofloxacin, and other fluoroquinolones), antibiotic coverage for both *Veillonella* spp. and *F. tularensis* could be considered until final microbial identification is available.

Questions should be directed to DHSS' Bureau of Communicable Disease Control and Prevention at 573/751-6113 or 800-392-0272 (24/7).

References

1. Notes from the Field: Veillonella misidentified as *Francisella tularensis* – Idaho, 2016. *MMWR* 2017; 66(21);564-5. https://www.cdc.gov/mmwr/volumes/66/wr/mm6621a4.htm

2. Weber IB, Turabelidze G, Patrick S, Griffith KS, Kugeler KJ, Mead PS. Clinical recognition and management of tularemia in Missouri: a retrospective records review of 121 cases. *Clin Infect Dis* 2012; 55(10): 1283-90. https://academic.oup.com/cid/article/55/10/1283/323868/Clinical-Recognition-and-Management-of-Tularemia?searchresult=1

***Tier 1 select agents are biologic agents and toxins that present the greatest risk for deliberate misuse with significant potential for mass casualties or devastating effects to the economy, critical infrastructure, or public confidence, and pose a severe threat to public health and safety.**