Notes from the Field

Two Cases of Human Plague — Oregon, 2010

Plague, caused by *Yersinia pestis,* is enzootic among rodents in the western United States. Humans can be infected through 1) the bite of an infected flea carried by a rodent or, rarely, other animals, 2) direct contact with contaminated tissues, or 3) in rare cases, inhalation of respiratory secretions from infected persons or animals. In September 2010, the Oregon Health Authority reported the first two cases of human plague in Oregon since 1995 and the only two U.S. cases in 2010.

Both illnesses began on August 21. The patients, aged 17 and 42 years, lived in the same household and might have been exposed to plague by infected fleas from one of their dogs; that dog was found to be seropositive for *Y. pestis* by the passive hemagglutination-inhibition assay (dilution of 1:64). One patient acknowledged sleeping in the same bed with the dog during the 2 weeks before illness onset. Both patients had high fever and multiple bilateral inguinal buboes; one patient had hypotension, tachycardia, and acute renal failure and was hospitalized. A gram-negative rod with bipolar staining was isolated from a specimen of that patient's blood.

Four different clinical laboratories attempted to identify the isolate. Three different commercial automated systems identified the organism as *Acinetobacter lwoffii, Pseudomonas luteola*, and *Yersinia pseudotuberculosis*, respectively. However, 25 days after specimen collection, the isolate was identified as *Y. pestis* by direct fluorescent antibody to F1 antigen, polymerase chain reaction, and bacteriophage lysis at the Spokane (Washington) Regional Health District Laboratory, prompting notification of the Oregon Health Authority. The second patient was identified retrospectively on the basis of a single positive serology (passive hemagglutination-inhibition [dilution of 1:32]). Plague was not suspected initially. Both patients recovered uneventfully after empiric therapy with doxycycline and amoxicillin clavulanate potassium, respectively, although the latter is not considered effective in treating plague.

Automated bacterial identification systems can misidentify *Y. pestis* (*1,2*). Automated identification of *Yersinia* spp. in blood should prompt further clinical evaluation of the patient to determine whether symptoms are compatible with plague. When plague is suspected, treatment should be started immediately, and both the state public health laboratory and public health authorities should be notified promptly.

Plague is a Category A potential bioterrorism agent. Human infections are rare but can be life-threatening. The plague case-fatality rate depends on the clinical presentation (i.e., bubonic, septicemic, or pneumonic) and timing of antibiotic therapy initiation; if untreated, the case-fatality rate is >50% for bubonic plague and approaches 100% for pneumonic plague (*3*). Rapid laboratory identification can help guide therapy.

Sleeping in the same bed with dogs has been associated with plague in enzootic areas (*4*). Plague patients with no history of exposure to rodents can be infected by *Y. pestis* if their pets carry infected rodent fleas into the home. Veterinarians always should recommend flea control to dog and cat owners.

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References

1. American Society for Microbiology. Sentinel laboratory guidelines for suspected agent of bioterrorism: *Yersinia pestis*. Washington, DC: American Society for Microbiology; 2009. Available at http://www.asm.org/images/pdf/Clinical/ypestis12-11-09.pdf. Accessed February 17, 2011.
2. CDC. Fatal human plague—Arizona and Colorado, 1996. MMWR 1997;46:617–20.
3. CDC. Human plague—four states, 2006. MMWR 2006;55:940–3.
4. Gould LH, Pape J, Ettestad P, Griffith KS, Mead PS. Dog-associated risk factors for human plague. Zoonoses Public Health 2008;55:448–54.