Elizabethkingia anophelis Outbreak in Wisconsin: A Mystery for CDC Disease Detectives

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What causes a bacterium that is ubiquitous in soil, rivers, water reservoirs and the guts of mosquitoes to suddenly cause an outbreak of human infection? The bacterium is Elizabethkingia anophelis\(^1\), and the outbreak is affecting at least 12 Wisconsin counties. The common source of the outbreak remains a mystery at this time. According to the World Health Organization, the current US outbreak (it also includes one case each in Illinois and Michigan) is the largest of Elizabethkingia anophelis on record.

A Very Rare Infection

Although it is common in the environment, Elizabethkingia anophelis only rarely makes people sick, according to the US Centers for Disease Control and Prevention (CDC). In fact, most states typically report no more than five to ten Elizabethkingia anophelis infections per year. Currently, the Wisconsin Department of Health Services website notes 59 confirmed and four possible cases of infection, including 19 deaths. Symptoms of infection include fever, shortness of breath, chills or cellulitis (a potentially serious bacterial skin infection).

Elizabethkingia anophelis is known as an opportunistic bacterium, which means it normally does not cause disease, but can do so under the right circumstances, such as when a human host’s immune system is compromised. Most Elizabethkingia anophelis infections occur in people over the age of 65 and are associated with healthcare environments. A few cases of infection with the bacterium in newborns were associated with meningitis. Elizabethkingia anophelis usually infects the bloodstream of adults but has also been isolated from respiratory systems or joints.

Though not considered a “superbug,” the bacterium is resistant to many antibiotics. According to the Wisconsin Department of Health Services, it has “identified effective antibiotic treatment for Elizabethkingia, and has alerted health care providers, infection preventionists and laboratories statewide.”

\(^1\) Elizabethkingia anophelis was named after its CDC bacteriologist discoverer, Elizabeth O. King.
Because victims usually have severe underlying health conditions, it may be unclear whether the bacterium caused death or was a contributing factor in death. To complicate matters, the CDC lab in Atlanta is the only lab that can distinguish Elizabethkingia anophelis from the closely related Elizabethkingia meningoseptica, another emerging pathogen associated with infections in immunocompromised individuals and meningitis in newborns. Therefore, it is possible that cases of Elizabethkingia anophelis are underreported.

Addressing the Outbreak

CDC and Wisconsin Department of Health Services “disease detectives” are working diligently to identify a common source of Elizabethkingia anophelis infection. Potential sources include food, water, medications, personal care products and medical equipment. Given the population affected thus far, healthcare facilities, including hospitals, nursing homes and long-term care facilities are likely venues for investigation. Meanwhile, according to the Wisconsin Department of Health Services website, guidance from health officials is promoting more rapid identification of cases, timely treatment and improved outcomes for patients.

While not a concern for most healthy people, the current outbreak of Elizabethkingia anophelis infection is an excellent example of an unfolding disease investigation that includes the essential elements of disease monitoring, reporting and communicating.

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