Fulminant Septicemia from Aeromonas Hydrophilia in a Non-Mobile Diabetic Patient: A Case Report

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Statement of Purpose

We present the first documented case of Aeromonas hydrophilia causing septic shock, multi-organ system failure, disseminated intravascular coagulation (DIC), diffuse cutaneous necrosis and rapid demise in a non-mobile patient with entry of infection secondary to a chronic foot wound and contaminated well water.

Literature Review

The genus Aeromonas is a group of gram-negative rods that are commonly distributed in aquatic environments including freshwater, estuarine and marine ecosystems. Aeromonas species (spp.) have also been found in drinking water, surface water and polluted water sources. They are frequently encountered during warmer months and in temperate climate regions. Aeromonas species have been divided into two groups, motile and non-motile. The motile group consists of 8 species, all of which can cause disease in humans. Among Aeromonas species, caviae, veroni and hydrophilia account for greater than 85% of human infections.

Aeromonas spp. are a rare cause of infectious disease but can be a serious threat, especially to immunocompromised hosts. Aeromonas infections can lead to diarrhea, soft tissue infections including myonecrosis, bacteremia and spontaneous peritonitis. Sepsis related Aeromonas infections are extremely rare and typically affect immunocompromised individuals.

Mortality due to monomicrobial Aeromonas infection has been reported up to 32% in one series. A majority of these patients suffered from hepatic cirrhosis or malignancy, highlighting the impact of an immunocompromised state on mortality due to Aeromonas infections. Risk factors for monomicrobial infection included male sex, cirrhosis, and water exposure. In addition, those infected with Aeromonas hydrophilia had a worse prognosis compared to other species.

In our present case report, we describe the first reported case of septicemia caused by contaminated well water with chronic foot ulcers as the portal of entry.

Case Study

A 69-year-old Caucasian male presented to the emergency department after he began experiencing sudden visual loss in the right eye along with neck pain and a headache. The patient’s vitals upon initial assessment were within normal limits with the exception of tachycardia at 120 beats per minute. The patient’s white blood cell (WBC) count was 15.6 K/mm3. The patient was initially worked up for a transient ischemic attack (TIA) versus ophthalic arterial thrombosis and started on broad-spectrum antibiotics including Piperacillin-Tazobactam and Vancomycin. An ophthalmology consultation was obtained and the visual loss was attributed to retinal artery thrombosis. The patient’s past medical history was notable for diabetes mellitus, hypertension, COPD requiring home oxygen, severe peripheral artery disease with prior left below knee amputation, and stage renal disease requiring hemodialysis three days a week, and atrial fibrillation.

The patient was admitted and the following day was noted to have extensive hemorrhagic bullae on his extremities as well as an acute onset of right foot and leg pain. The patient’s status rapidly declined and he was transferred to the Intensive Care Unit. He was started of Norepinephrine and ventilatory support. Two sets of blood cultures drawn on admission grew Aeromonas hydrophilia resistant to Ampicillin and Ampicillin/Subactam but susceptible to Piperacillin-Tazobactam. The patient secondarily suffered from septic shock, multi-organ system failure, disseminated intravascular coagulation and diffuse cutaneous necrosis. Despite aggressive care including active antibiotics, the patient died within 72 hours of admission.

Upon review of the patient’s medical record, the patient was found to have undergone an angioplasty of his right lower extremity the previous week in an attempt to heal a chronic heel ulcer and foot and leg pain. Further investigation revealed the patient used well water as his primary source of water for bathing and drinking. As the patient was wheelchair bound and had not been outdoors, the mechanism of Aeromonas entry was suspected to be from introduction of contaminated well water through the right foot ulcer while bathing. The prior week torrential storms flooded the local community and it was suspected that the well water was contaminated from these floods. Samples were obtained from the patient’s residence well water source and Aeromonas hydrophilia was cultured.

Discussion

Aeromonas was first described as a human pathogen in 1954. Aeromonas infections occur more frequently in males and human infections are more commonly community acquired. Wound infections complicated by Aeromonas occur due to contaminated fresh and, less frequently, salt-water sources. Aeromonas infections tend to peak in warm climates and up to 75% of cases occur in summer months. It is important to distinguish infections due to Aeromonas species from other oxidase positive genera such as Vibriob and Plesiomonas. Empiric therapy to cover all of these organisms before culture results are available consists of fluoroquinolones, anti-pseudomonal cephalosporins and penicillins. Recently, there have been reports of Aeromonas resistant to most cephalosporins. Ciprofloxacin, Gentamicin, and Amikacin have been consistently active against Aeromonas infections causing human disease.

Although other regulated water sources are tested frequently for bacteria including Aeromonas, well water is not tested. The Center for Disease Control and Prevention recommends testing well water yearly for bacteria and mechanical problems but there is no requirement to do so. This vulnerability is apparent in this case with our patient whose well water was likely contaminated from previous flooding and an unchecked well system.

Aeromonas infections are an uncommon cause of human disease leading to morbidity and mortality. Traditional risk factors have included immunocompromised patients, and those with outdoor water exposure. Well water may be an additional unreported risk factor to consider as well. This case is the first to describe Aeromonas hydrophilia transmission via a foot ulcer due to contaminated well water leading to septic shock, multi-organ failure, cutaneous necrosis, DIC and ultimately the patient’s death. Although rare, we as clinicians must remain vigilant in identifying these infections, their sources, and educating our patients in preventative measures.

References