

Infections in Immunocompromised Patients Following Hurricane-Induced Flooding, A Case Series

*Sofia Soto, MSPA, PA-C; Karina Mullins, MSPA, PA-C;
Enas Abdallah, MD, MS-c*



Introduction

Natural disasters can present unique public health challenges, particularly for vulnerable groups. Back-to-back hurricanes, Helene and Milton devastated Florida. Enormous water displacement, disruption of sewage infrastructure, stagnant water, and limited access to clean drinking water created an ideal breeding ground for atypical pathogens. Helene brought up to 20 inches of rain in some areas of Tampa Bay and Milton set records for river heights, with the Hillsborough River reaching up to 38 feet. Many of these areas remained flooded for weeks following the storms. The historic flooding from these storms appears to pose a significant threat to the health of Floridians. Organisms like *Legionella* can thrive after hurricanes due to the sunshine and heat that can evaporate and aerosolize floodwaters, leading to an increase in respiratory infections. Hurricanes also push coastal waters inland, increasing the exposure of *Vibrio* and other coastal water pathogens to residents. This case series aims to shed light on four likely hurricane-related illnesses in immunocompromised patients. It should be noted all 4 cases involved patients with pancytopenia receiving antineoplastic chemotherapy, resulting in an immunocompromised state.

Case 1

A 61-year-old male with MDS and associated neutropenia presented with a worsening right thigh wound after wading in waist-deep floodwaters near a sewage plant. He underwent a biopsy of the wound, and cultures were positive for *Aeromonas dhakensis*. (Figures 1 and 2).

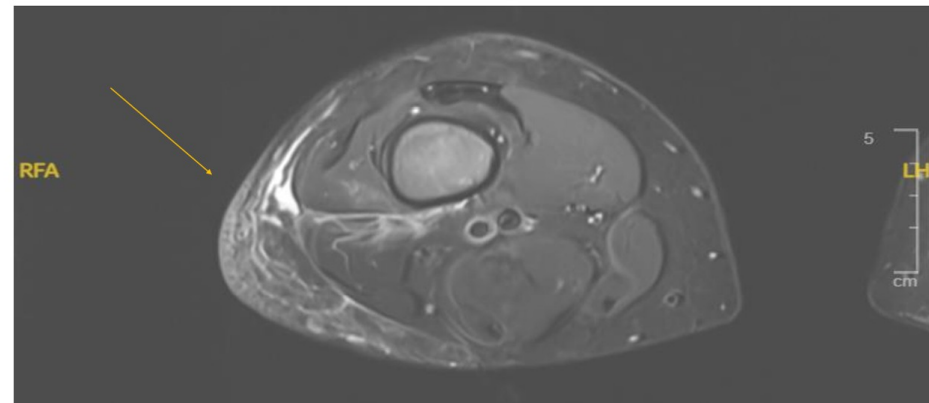
Case 2

A 52-year-old male with follicular large-cell lymphoma and associated pancytopenia was evaluated for edema, erythema, and pain in his right hand after he was cleaning up yard debris with possible water exposure from utilizing water from his hot tub. Swelling, erythema, and pain improved with IV vancomycin.

Case 3

A 54-year-old male with stage IV pancreatic cancer on chronic TPN presented with rigors, tachycardia, tachypnea, and a severe lactic acidosis. It was reported that his chest wall port got wet during Hurricane Milton. IV Zosyn was initiated on presentation and his initial blood cultures grew *E. coli*. Ultimately there was delayed growth of *Acinetobacter nosocomialis*.

Figure 1



MRI of right lower extremity with T2 flair noting cellulitis and myositis associated wound in 61-year-old male with MDS, neutropenia and right thigh wound.

Figure 2



Tender right lateral thigh with erythematous nodule with dusky central ulceration and raised pink bullous annular border appx 2cm in width

Case 4

A 74-year-old female with MDS presented with fever, chills, fatigue, and generalized weakness. She lived in an area that was flooded and was started on a broad-spectrum antibiotic regimen for possible pneumonia noted on routine chest X-ray. She developed coffee-ground and black-colored diarrhea. CT A/P demonstrated worsening pneumonia. Despite initial *Legionella* and Strep urine antigen tests that were negative, a Karius test and BAL sample were positive for *Legionella*. Her condition improved significantly following course of azithromycin.

Conclusion

As hurricane intensities are expected to increase, incidents of catastrophic flooding from rain or storm surge will continue to impact Florida. It's crucial to consider the indirect effects on the health of Floridians, particularly immunocompromised patients. These highlighted cases serve as reminder to keep waterborne pathogens on the differential in the weeks and months following a hurricane. A thorough social history which includes identifying potential hurricane-related exposures, is essential in ensuring accurate diagnosis and treatment. By adopting these strategies, we can provide guided antibiotic regimens to prevent further clinical decline. Moreover, given the heightened risk of atypical infections, it's vital to counsel patients to maintain a low threshold for evacuating from areas at risk for flooding.

References

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