Michigan reports two deaths in cyclosporiasis outbreak, raising public health concerns

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Cyclosporiasis, an intestinal illness caused by the microscopic parasite Cyclospora cayetanensis, typically presents with watery diarrhoea, abdominal cramps, and fatigue. While often self-limiting, recent reports from Michigan of two fatalities linked to an ongoing outbreak highlight the potential for severe outcomes, particularly in vulnerable populations. This development highlights the need for heightened vigilance among clinicians regarding diagnosis and management of this food- and water-borne pathogen.

KEY TAKEAWAYS

- The Pivot: Two deaths in Michigan elevate cyclosporiasis from a nuisance infection to a serious public health threat requiring prompt clinical attention.
- The Data: Cyclosporiasis outbreaks are often linked to contaminated fresh produce, with symptoms appearing approximately one week after exposure.
- The Action: Clinicians should consider cyclosporiasis in patients presenting with prolonged diarrhoeal illness, especially those with recent travel history or consumption of suspect produce, and initiate appropriate testing and treatment.

Cyclosporiasis results from ingesting oocysts of Cyclospora cayetanensis, a protozoan parasite. The oocysts are not immediately infectious when shed in faeces; they require several days to weeks in the environment to sporulate and become infective. This characteristic means direct person-to-person transmission is unlikely. Instead, outbreaks typically trace back to contaminated fresh produce, often imported, or contaminated water sources. The incubation period for cyclosporiasis ranges from 2 to 14 days, with an average of about 7 days, before symptoms manifest. Patients commonly experience profuse, watery diarrhoea, often accompanied by anorexia, weight loss, abdominal cramps, nausea, vomiting, myalgia, and low-grade fever. Without treatment, symptoms can persist for weeks to months, with relapses possible. The recent reports from Michigan, confirming two deaths associated with a cyclosporiasis outbreak, serve as a stark reminder that this infection, while generally considered non-fatal, can have severe consequences. These fatalities highlight the importance of early diagnosis and appropriate management, particularly for individuals who may be immunocompromised or have underlying health conditions. The Michigan Department of Health and Human Services has been actively investigating the outbreak, working to identify the source of contamination and prevent further spread. Public health investigations into such outbreaks are complex, often involving extensive traceback efforts to pinpoint the specific contaminated food item or water source responsible.

The Pathogen and its Clinical Course

Cyclospora cayetanensis is an obligate intracellular parasite that infects the small intestine. After ingestion, sporulated oocysts excyst in the gastrointestinal tract, releasing sporozoites that invade enterocytes. Within these cells, the parasite undergoes asexual and sexual reproduction, producing unsporulated oocysts that are shed in the faeces. The unsporulated oocysts are not infectious, requiring maturation outside the host. This unique life cycle explains why direct transmission between individuals is rare and why environmental contamination, particularly of food and water, is the primary mode of spread. The parasite's resistance to routine chlorination also complicates water treatment efforts, making filtration a more effective control measure.

Diagnosis of cyclosporiasis relies on microscopic examination of stool samples to identify Cyclospora oocysts. These oocysts are spherical and typically measure 8-10 micrometres in diameter. Modified acid-fast staining or autofluorescence under ultraviolet light can aid in their detection, as they may be difficult to distinguish from other parasites using conventional microscopy. Multiple stool samples may be necessary due to intermittent shedding of oocysts. Polymerase chain reaction (PCR) tests are also available and offer higher sensitivity and specificity, particularly in cases with low parasite burden. Given the potential for severe outcomes, clinicians should maintain a high index of suspicion for cyclosporiasis in patients presenting with prolonged diarrhoeal illness, especially during warmer months when outbreaks are more common, or following travel to endemic areas.

Treatment and Prevention Strategies

The standard treatment for cyclosporiasis is trimethoprim-sulfamethoxazole (TMP-SMX). For adults, the typical dosage is 160 mg TMP and 800 mg SMX orally twice daily for 7 to 10 days. Paediatric dosing is adjusted based on weight. Patients who are allergic to sulfa drugs or cannot tolerate TMP-SMX present a therapeutic challenge, as alternative effective treatments are limited. Ciprofloxacin has shown some activity against Cyclospora, but it is generally considered less effective than TMP-SMX. Nitazoxanide is another option, particularly for immunocompromised patients, but its efficacy is variable. The Oxford Handbook of Infectious Diseases and Microbiology provides further detail on these and other antimicrobial strategies.

Prevention of cyclosporiasis primarily focuses on avoiding contaminated food and water. This includes thoroughly washing all fresh produce, especially berries, leafy greens, and herbs, even if pre-packaged. Boiling water or using a reliable water filter can reduce the risk from contaminated water sources. Travellers to regions where cyclosporiasis is endemic should exercise caution with food and water consumption, adhering to the adage "boil it, cook it, peel it, or forget it." Public health agencies play a critical role in outbreak investigation, identifying sources of contamination, and issuing advisories to the public. The Michigan deaths highlight that while rare, severe outcomes from cyclosporiasis are a reality, demanding a robust public health response and clinical awareness.

> **CLINICAL IMPLICATIONS**
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> The Michigan fatalities linked to cyclosporiasis should prompt a re-evaluation of this parasitic infection by clinicians. While often dismissed as a self-limiting gastrointestinal upset, the potential for severe illness and death, particularly in vulnerable patients, means we cannot afford to be complacent. A thorough history, including recent travel and dietary habits, is paramount for any patient presenting with persistent diarrhoea. Diagnostic efforts must be precise. Standard stool ova and parasite exams may miss Cyclospora, necessitating specific requests for modified acid-fast staining or PCR. Delaying diagnosis not only prolongs

> patient suffering but also increases the risk of complications, as demonstrated by the Michigan cases. Early and accurate identification allows for timely initiation of TMP-SMX, which remains the most effective treatment. For patients with sulfa allergies or contraindications, the limited alternative treatments present a genuine clinical dilemma. This highlights an unmet need for broader therapeutic options. Clinicians should be prepared to manage these challenging cases with careful consideration of available, albeit less efficacious, alternatives and supportive care.
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> These deaths serve as a stark reminder that even seemingly benign infections can turn deadly. Public health surveillance and rapid clinical response are critical. GPs and specialists alike must integrate cyclosporiasis into their differential diagnoses for prolonged diarrhoeal illness, ensuring that this preventable and treatable infection does not claim more lives.

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