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Outbreak of Shigellosis in a Homeless Shelter With Healthcare Worker Transmission—British Columbia, April 2015

To the Editor—Shigellosis is a highly infectious bacterial infection with symptoms from mild, self-limiting gastroenteritis to severe illness. *Shigella flexneri* and *S. sonnei* are the 2 most common species in British Columbia.¹ Most cases (62%) in British Columbia are travel related. Domestic outbreaks in daycares and through sexual contact are common owing to type of contact and low infectious dose for *Shigella* species—10 or fewer organisms.² Outbreaks in homeless populations are a concern owing to client vulnerability and risk of widespread transmission from inadequate sanitation. Healthcare workers are considered at high risk of transmission to others if they are ill with shigellosis; however, transmission of *Shigella* to healthcare workers is rarely documented in outbreak investigations. In April 2015, British Columbia public health officials investigated a shigellosis outbreak among persons associated with a homeless shelter and their attending healthcare providers.

Patient A, a middle-aged man with medical history including cirrhosis and hepatocellular carcinoma secondary to hepatitis B and C infection, developed bloody diarrhea and abdominal cramping on March 31, 2015, that persisted for 1 week before hospital admission on April 7, 2015. Episodes of uncontrollable loose bowel movements resulted in fecal contamination of his living environments, including a shelter day-program. Blood and stool cultures collected on April 7 grew *S. sonnei*. He was treated with ceftriaxone but remained in the hospital until April 30, 2015, owing to complications of his underlying medical conditions.

Patient B, a middle-aged man with a history of injection drug abuse and chronic hepatitis C, developed fever, confusion, and profuse diarrhea on April 1, 2015, while at the same shelter day-program patient A attended. Emergency services attended to him at the shelter and transported him to the hospital. On admission, he was covered in stool, was febrile (temperature, 39°C), and had delirium and decreased level of consciousness requiring sedation and intubation. Stool cultures collected on April 3 grew *S. sonnei*. He was treated with piperacillin/tazomycin while in the hospital. He left the hospital against medical advice on April 4.

Patient C, a previously healthy middle-aged man, was part of the first responder team who attended patient B at the shelter on April 1, including transferring and handling his soiled clothes. Patient C sprayed his contaminated boots, removed his gloves, and cleaned his hands with alcohol-based hand sanitizer. He developed symptoms of bloody diarrhea and abdominal discomfort on April 4; stool culture collected on April 11 grew *S. sonnei*.

Patient D, a previously healthy middle-aged healthcare worker, attended to patient B in the emergency department on April 1. She donned gown and gloves and followed hand hygiene per usual contact precautions but noted that patient B's thrashing was spreading feces widely. She developed diarrhea on April 3; stool culture collected on April 10 grew *S. sonnei*.

Pulsed-field gel electrophoresis using both Xba and Bln enzymes are routinely performed on all *S. sonnei* in British Columbia using PulseNet Canada protocol.³ Pulsed-field gel electrophoresis patterns of *S. sonnei*, subgroup D, for 3 of the 4 ill persons' stool specimens were identical by both enzymes. Patient C had a closely related Xba pattern and identical Bln pattern. Susceptibility testing showed varying multidrug-resistance patterns, but all 4 isolates were resistant to ciprofloxacin and trimethoprim/sulfamethoxazole. Isolates of patients A and C were susceptible to ampicillin and ceftriaxone, whereas those of patients B and D were not. Patient B's isolate was initially reported as resistant to azithromycin, but according to *Salmonella* Typhi minimal inhibitory concentration breakpoints for azithromycin sensitivity against *Shigella*, both patients B and D were sensitive to azithromycin.

We evaluated the potential exposures from each patient and conducted an environmental assessment to determine the risk for further disease transmission. Public health actions at the shelter included active case finding of other clients and staff, which revealed no additional cases. Shelter management and outreach medical clinic staff received education on transmission of diarrheal illness, and signage was posted to reinforce good personal hygiene. Thorough disinfection and cleaning of the shelter were undertaken.

Staff at the local hospital were notified of the outbreak and alerted to contact public health immediately with any additional suspect cases. All cases of shigellosis reported from March 25 through April 20, 2015, were reviewed for potential linkage to this cluster.

S. sonnei generally causes milder diarrheal illness compared with other *Shigella* species.⁴ The severity of illness in patients A and B was likely related to chronic comorbid conditions, a consideration for treating shigellosis in a homeless population. Incomplete treatment of patient B posed a risk to the patient and risk of transmission of a multidrug-resistant strain. Recent reports that 87% of *S. sonnei* isolates in the United States were nonsusceptible to ciprofloxacin have raised awareness of drug resistance and the need for rational antibiotic treatment.⁵ Laboratory testing of isolates from

all 4 cases in this outbreak showed nonsusceptibility to ciprofloxacin and additional resistance to typical first-line antibiotics. However, without Clinical and Laboratory Standards Institute guidelines for azithromycin susceptibility interpretation, testing for azithromycin is not routine and inconsistently reported.

Transmission to 2 healthcare workers, despite appropriate contact precautions, highlights the increased risk from explosive diarrhea due to shigellosis. Contact precautions are the recommended standard but droplet precautions, including foot coverings, masks, and goggles, may be more appropriate for managing a patient with uncontrolled diarrhea.⁶ Soap and water hand hygiene may be more effective than alcohol-based hand rub in removing gross contamination on hands and forearms.^{7,8}

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Michelle Murti, MD, MPH, FRCPC;¹
Ken Louie, EHO;¹
Mark Bigham, MD, FRCPC;¹
Linda M. N. Hoang, MD, FRCPC²

Affiliation: 1. Fraser Health Authority, Surrey, British Columbia; 2. British Columbia Public Health Microbiology and Reference Laboratory, Vancouver, British Columbia.

Address correspondence to Michelle Murti, MD, MPH, FRCPC, 400-13450 102 Ave, Surrey, BC, Canada, V3T0H1 (michelle.murti@fraserhealth.ca).

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Paper Records of Patients in Isolation for Colonization or Infection With Special Organisms: A Potential Fomite?

To the Editor—The fear of paper records or order sheets as a potential fomite for the spread of organisms in healthcare facilities is not new¹ but studies have revealed different findings based on the level of contamination in various settings.^{1–4} Therefore we wanted to assess the degree of contamination of paper records from patients who were placed in single-room isolation precautions for colonization or infection with special organisms. Medical charts of clinical ward patients who were placed in isolation for more than 2 weeks, according to the hospital policy of a 696-bed tertiary care center, were included. No institutional review board approval was needed for this non-patient care study, and access to infection control surveillance data by staff is mandated by German federal infection law (IfsG). Descriptive data were analyzed by *t* test; *P* < .05 was considered significant.

From October 1, 2014, through March 1, 2015, eligible records were identified by infection control staff and examined upon patient discharge from the isolation room. Medical charts are kept outside of the room. Per hospital policy, healthcare workers should disinfect their hands after removal of personal protective equipment and before writing notes; however, adherence to this practice was not specifically monitored.

Paper records consist of a plastic cover (1 sample taken) and a paper insert (front page and 1 random page sampled). RODAC (replicate organism detection and counting) plates or appropriate special media were used according to the patients' known organisms and the Microbiology Procedures Quality Standards.⁵ Samples were cultivated for up to 8 weeks.

Fifteen paper records were identified and sampled. Figure 1 shows the distribution of organisms, with methicillin-resistant