



To: CAHAN San Diego Participants
Date: February 24, 2015

Shiga toxin-producing *Shigella sonnei* Cases in San Diego County

This health alert informs the medical community about recent Shiga toxin (Stx)-producing *Shigella sonnei* cases in San Diego County and California, describes clinical and epidemiologic aspects of these cases, and provides recommendations for testing and reporting. The County of San Diego Health and Human Services Agency (HHSA) requests that healthcare providers report suspect cases of Stx-producing *Shigella*, and reminds laboratories that *Shigella* isolates and Stx-positive broths should be forwarded to the San Diego County Public Health Laboratory (SDPHL) for confirmatory testing.

Background

Shiga toxins are a family of cytotoxins most commonly associated with Shiga toxin-producing *E. coli* (STEC), such as *E. coli* O157, and *Shigella dysenteriae* type 1. Shiga toxins have rarely been associated with other *Shigella* species. A [recent study](#) described 26 cases, spanning 13 years, of Stx-producing *Shigella flexneri*, many epidemiologically linked to travel to Hispaniola. Stx-producing *Shigella sonnei* has been even more infrequently identified. STEC bacteria express Stx1 and Stx2; *Shigella dysenteriae* expresses a Stx that is nearly identical to Stx1.

Shigella species and STEC typically cause similar illnesses, characterized by severe stomach cramps, diarrhea (frequently bloody), and fever. Both *Shigella dysenteriae* type 1 and STEC, particularly Stx2-producing serotypes such as O157, can cause severe clinical complications, including hemolytic uremic syndrome (HUS). In addition, both *Shigella* and STEC bacteria have a low infectious dose, making person-to-person transmission common.

Stx-producing *Shigella sonnei* has been rarely detected and little is known about disease characteristics, epidemiology, or optimal treatment. Following multiple reported cases of this rare infection, HHSA and the California Department of Public Health initiated an investigation, including enhanced interviews and laboratory testing, to further characterize these cases.

Summary of Cases

Between June 1, 2014 and December 31, 2014, 25 confirmed cases of Stx1-producing *Shigella sonnei* were detected in California; 20 of these cases were among San Diego County residents. Onset dates ranged from June 26, 2014 to December 18, 2014. The median age of case-patients is 11 years, with a range of two to 64 years. Fifty-six percent are female. Although one pulsed-field gel electrophoresis (PFGE) pattern combination has predominated, multiple pattern combinations have been found. Among the 15 with antibiotic sensitivities available for review, 14 (93%) were resistant to trimethoprim-sulfamethoxazole. No other antibiotic resistance was noted.

Among case-patients with available clinical information, 100% reported diarrhea, 56% bloody diarrhea, 79% fever, 80% abdominal cramps, and 44% vomiting. Sixteen percent of those with available information were hospitalized and 56% visited an emergency department. There have been no reported deaths or cases of HUS. Twelve of the cases are likely secondary due to household transmission, suggesting significant person-to-person transmission. Of the 13 primary cases, eight reported travel to Mexico during the seven days prior to illness onset.

Treatment

Infection with *Shigella* species generally is self-limited, and the mainstay of treatment is supportive to correct fluid and electrolyte losses. There are no definitive data addressing antibiotic treatment recommendations for Stx1-producing *Shigella sonnei*.

Shigellosis is sometimes [treated with antibiotics](#), particularly in patients who are in sensitive occupations (e.g., food service, child care, or healthcare) or are hospitalized. Antibiotics may shorten the duration of illness and decrease disease transmission to others. Although early antibiotic treatment of *Shigella dysenteriae* type 1 is [not associated with an increased risk of HUS](#), [the risk is increased](#) when the infecting bacteria are resistant to antimicrobial drugs that are used or when any antimicrobial drug is given more than four days after the start of diarrhea. Antibiotic treatment of STEC is associated with an [increased relative risk of developing HUS](#). If the decision to treat Stx1-producing *Shigella sonnei* with antibiotics is made, clinicians should be aware of resistance patterns and possible adverse outcomes. Trimethoprim-sulfamethoxazole should not be used to treat this infection.

Laboratory Testing

Because stool culture protocols differ among clinical laboratories, providers evaluating patients with community-acquired diarrhea must be familiar with the scope of testing at their laboratory of choice. Stool specimens submitted for examination for enteric pathogens are routinely tested by culturing for *Salmonella spp* and *Shigella spp*. Most laboratories also culture for *Campylobacter spp*. and *Escherichia coli* O157, but the inclusion of these organisms should not be assumed. Many laboratories now include in their routine test battery an enzyme immunoassay (EIA) test for Stx production. This non-culture examination does not identify the Stx-producing organism.

Given the detection of Stx1-producing *Shigella sonnei* in San Diego, providers are encouraged to order tests at their supporting laboratories that include both culture for *Shigella spp*. and examination for Stx. If a provider suspects other enteric pathogens, such as *Vibrio spp.*, *Yersinia spp.*, norovirus, or parasitic infections, specific testing must be requested. The laboratory must be informed if the stool specimen is associated with a hospitalized patient, because routine stool cultures do not examine for nosocomial or antibiotic treatment-associated infections.

Recommendations for Healthcare Providers

Healthcare providers are requested to do the following:

- Order both a Stx EIA and a stool culture for patients with compatible symptoms.
- Promptly report any person suspected to have Stx-producing *Shigella* to the Epidemiology Program at (619) 692-8499 (Mon-Fri 8:00 AM – 5:00 PM) or (858) 565-5255 (after hours/weekends/holidays). Both shigellosis and Shiga toxin (detected in feces) are [reportable conditions](#) in California. Healthcare providers are required to report and should not assume that the laboratory will report these infections.
- Consider consulting an infectious disease physician regarding management of patients with Stx-producing *Shigella*, especially if antibiotic treatment is considered necessary.

Recommendations for Laboratories

Laboratories are requested to do the following:

- Submit all Stx-positive fecal broths to the SDPHL as [required](#) in the California Code of Regulations.
- Submit all *Shigella* isolates to the SDPHL as [requested](#) by HHSA.
- Report any identification of both *Shigella* species and Stx from the same specimen to the Epidemiology Program at (619) 692-8499 (Mon-Fri 8:00 AM – 5:00 PM) or (858) 565-5255 (after hours/weekends/holidays).

Specimen submission questions may be directed to the SDPHL at (619) 692-8500. All other questions may be directed to the HHSA Epidemiology Program at (619) 692-8499.

Thank you for your continued participation.

CAHAN San Diego

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