

Outbreak of Campylobacteriosis in a Dairy Facility — Riley County, June 2014 - July 2014



Background

On July 18, 2014, the Riley County Health Department (RCHD) notified the Kansas Department of Health and Environment's Infectious Disease Epidemiology and Response section (KDHE) of a possible outbreak of campylobacteriosis among workers at the Kansas State University Dairy Unit, which houses approximately 200 cows in addition to heifer calves. Two cases were identified through routine surveillance by RCHD. The first case was reported to public health on June 17th, and the second case was reported on July 10th. RCHD and KDHE initiated an outbreak investigation on July 18th to identify additional cases and to implement prevention and control measures.

Methods

A questionnaire was created to assess the clinical histories of Dairy Unit workers. The questionnaires were delivered to the Dairy Unit on July 24th; workers were asked to self-administer the questionnaire and return it to the manager. Completed questionnaires were picked up periodically by RCHD between July 25th and August 4th.

A case was defined as a Dairy Unit worker who reported diarrhea between June 1, 2014 and August 4, 2014.

Laboratory testing via the Kansas Health and Environmental Laboratories (KHEL) was offered to any Dairy Unit worker who reported diarrhea since June 1, 2014. Three stool specimens were forwarded to KHEL for testing.

Results

Twenty-two of 65 student workers and eight of ten full-time workers completed the questionnaire, for a total response rate of 40%. Six individuals, including the two who were previously identified during routine surveillance, reported diarrhea and were classified as cases. Five cases were student workers, and one was a full-time worker, ranging from 20 to 39 years of age. Four cases (67%) were male. The first case reported illness onset on June 1, and the final case reported onset on July 25. Gastrointestinal symptoms and fever were commonly reported (Table 1). Four cases visited a health care provider, including two who sought care at an emergency department.

Table 1: Clinical information for cases (n=6)

<i>Symptom</i>	<i># Cases reporting</i>	<i># Cases with information available</i>	<i>Percentage</i>
Diarrhea	6	6	100%
Nausea	5	5	100%
Fever	5	6	83%
Abdominal Cramps	5	6	83%
Muscle Aches	4	5	80%
Vomiting	4	6	67%
Bloody Stool	3	6	50%

One of the three stool specimens that were forwarded to KHEL was positive for *Campylobacter jejuni*. This specimen and the two *C. jejuni* specimens that were reported to public health through routine surveillance were analyzed via Pulsed Field Gel Electrophoresis (PFGE). Two of the three isolates were indistinguishable by PFGE.

One case's specimen tested positive for *Campylobacter lari* at a private laboratory.

Discussion

Six cases of Campylobacteriosis, including 4 laboratory-confirmed cases, were identified among workers at the KSU Dairy Unit.

Campylobacteriosis is the most common bacterial cause of diarrheal illness, with an estimated 1.3 million persons affected each year in the United States.¹ Symptoms of diarrhea, abdominal pain, fever, and nausea or vomiting, usually appear within 2 to 5 days of exposure, and persist for 1 to 2 weeks. In less common instances, severe or prolonged illness or relapses can occur.

¹ CDC. Campylobacter Technical Information. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Available at <http://www.cdc.gov/nczved/divisions/dfbmd/diseases/campylobacter/technical.html#incidence>

Post-infectious syndromes, such as reactive arthritis and Guillian-Barre syndrome, can also occur.²

Chronic infection of animals, including cattle and poultry, is the largest source of infection; person-to-person transmission is rare.³ Studies of cattle in the United States have detected *Campylobacter* spp. in 19% to 39% of fecal specimens.⁴ *C. jejuni* and *C. lari* have each been associated with gastroenteritis with animals, although *C. lari* is less commonly reported.⁵

C. jejuni was detected in 3 of the 6 cases, and 2 of the *C. jejuni* isolates were indistinguishable by PFGE, suggesting those cases were exposed to the same source, possibly one infected cow. (Person-to-person transmission is a less likely explanation, as person-to-person transmission is rare.⁶) The *C. jejuni* case that did not match by PFGE and the case infected with *C. lari* were exposed to different sources. While 2 individuals tested negative for *Campylobacter* at KHEL, each submitted a stool specimen about one month after illness onset. These 2 negative results may be the result of a resolved infection rather than an alternative source of illness.

This investigation had several limitations. The questionnaire response rate was 40%, and all ill individuals may not have been identified. The case definition relied on self-reported diarrhea, and may include individuals who were ill from causes other than *Campylobacter*.

Specific exposures within the Dairy Unit were not evaluated for association with illness, as the unit manager reported that employees shared duties, rather than worked in specialized areas. Duties include shoveling manure, moving cattle to and from the milking parlor, milking, and feeding. No environmental testing was conducted to isolate *Campylobacter* spp. directly from the dairy cows or the work environment.

The Dairy Unit has several measures in place designed to limit *Campylobacter* infection. Signs are posted regarding policies that prohibit food or drink and encourage handwashing. Employees are required to sign a fact sheet about *Campylobacter* as a part of orientation. Continuing training and education should be provided at regular intervals to Dairy Unit staff, and prevention measures should be emphasized when high-risk activities, such as handling ill calves, are performed.

² Patrick M, Schlundt J. *Campylobacter* enteritis. Control of Communicable Disease Manual. 19th ed. Washington DC: APHA, 2008: 94-98.

³ Ibid.

⁴ Leedom Larson KR, Spickler AR. *Campylobacteriosis*. Iowa State University, The Center for Food Security and Public Health; November 2013. Available at <http://www.cfsph.iastate.edu/DiseaseInfo/factsheets.php>

⁵ Ibid.

⁶ Patrick M, Schlundt J.

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