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Norovirus Outbreaks at a Food Service Establishment, Connecticut 2018–2019

During December 2018–January 2019, two outbreaks of acute gastrointestinal illness occurred at the same food service establishment (FSE). The Connecticut Department of Public Health (DPH) and local health department (LHD) investigated both outbreaks to determine cause and extent of illness and implement control measures. Norovirus was detected in 22 of 25 tested stool specimens from FSE, patrons and workers; genetic sequencing of six norovirus-positive stool specimens revealed that both outbreaks were caused by the same strain of norovirus.

Outbreak 1

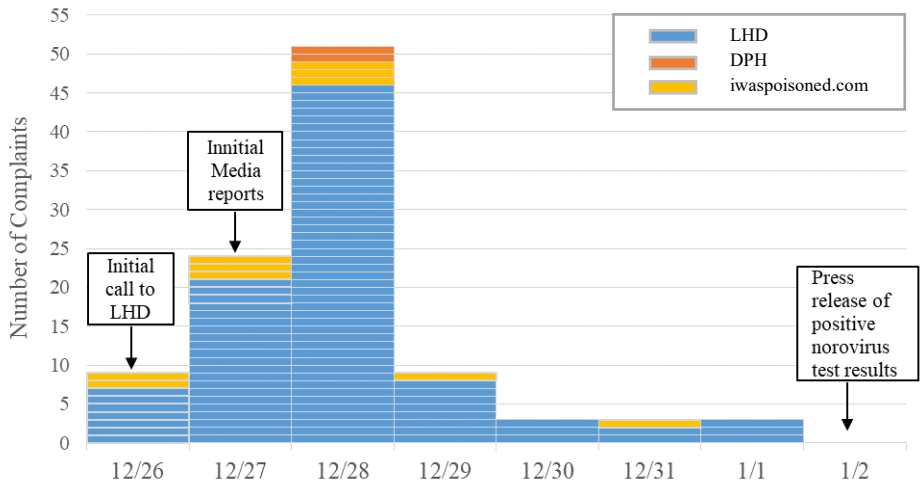
Epidemiology Investigation

During December 26, 2018–January 1, 2019, complaints (n = 101) about an FSE were reported to the LHD, DPH, or the website https://iwaspoisoned.com (Figure 1). Patrons reported eating at the FSE during December 20–24. To assess the extent and severity of illness and food exposures, DPH emailed a survey link to 74 complainants who provided an email address during December 28-31; complainants were asked to distribute the survey link to everyone in their dining party, regardless of illness status. A case was defined as vomiting or diarrhea (≥3 loose stools in 24 hours) in a patron who dined at the FSE during December 20–24.

Among 121 patrons who completed the survey, 69 (57%) reported illness meeting the case definition, 26 (21%) were healthy, and 26 (21%) reported illness that did not meet the case definition or did not finish the survey and were excluded from analysis. Among 69 ill respondents, 54 (78%) were female; median age was 44 years (range: 14–73 years). The median incubation period was 32 hours (range: 1–49 hours), onset of illness ranged from December 21–26 (Figure 2), and median illness duration was 2 days (range: <1–6.5 days). Most patients reported nausea (n = 65 [94%]), diarrhea (n = 63 [91%]), and vomiting (n = 61 [88%]). Seven case-patients sought medical attention; one was hospitalized and none died.

Case-control analysis compared consumption of each FSE food item among 69 case-patients with 26 non-ill survey respondents. Consuming any of six salads served by the FSE was associated with illness (odds ratio: 5.54 [95% CI: 2.06, 14.93]); salads were eaten by 57 (83%) case-patients and 12 (46%) non-ill respondents. No other food items were associated with illness.

Figure 1: Food service establishment complaints by source and date — Outbreak 1, Connecticut food service establishment, 2018–2019



Environmental Investigation

During December 26–27, LHD observed FSE food handling and interviewed 53 of 59 FSE employees using a standardized form. Ten (19%) employees reported vomiting or having diarrhea during December 10–26; three (6%) reported that they had worked while symptomatic (Figure 2).

On December 28, DPH FPP performed an environmental assessment of the FSE using

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CDC's National Environmental Assessment Reporting System guidelines (*1*). The following concerns were identified: inadequate handwashing, bare hand contact with ready-to-eat foods, inadequate access to handwashing sinks, and no written policy on excluding ill food workers from work. Among four handwashing sinks, one was broken, one was inaccessible, one had a clogged drain, and one had only hot water that was too hot for workers to use.

Laboratory Investigation

LHD requested stool samples from all ill food workers and DPH requested stool samples from 10 ill patrons. Stool samples were tested by real-time reverse transcription polymerase chain reaction (RT-qPCR) by the DPH State Public Health Laboratory. Stool samples from 9 of 10 patrons and 8 of 10 food workers, including the person who worked while symptomatic and prepared salads on December 22–23, tested positive for norovirus genogroup II; one food worker's stool sample also tested positive for norovirus genogroup I.

Control Measures

On December 27, FSE closed voluntarily for 24 hours and ill food workers were excluded from work until 72 hours after symptom resolution. Before reopening, FSE relocated one hand sink and unclogged another, reprinted menus, adopted a written ill food workers policy, and cleaned the establishment. On December 29, four employees completed a certified food protection manager course.

Outbreak 2

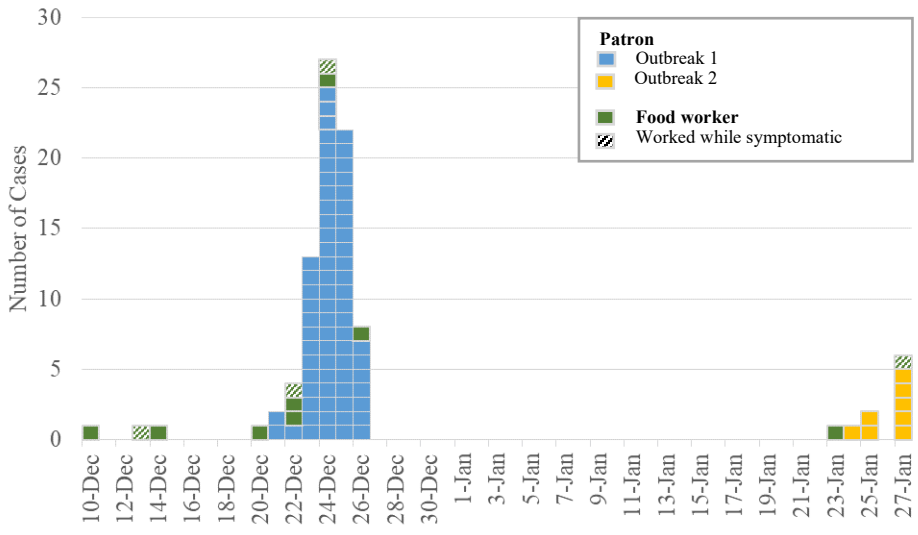
During January 25–29, 2019, LHD received complaints about the same FSE from three dining parties. DPH contacted, interviewed, and requested stool samples from five patrons. Interviewed patrons reported eight of 10 patrons met the case definition, which was vomiting or diarrhea in a patron who dined at the FSE during January 23–25. No common food items were identified. LHD interviewed 40 FSE employees and requested stool samples from two ill food workers who reported recent vomiting or diarrhea. One employee had worked while symptomatic; neither had reported illness during outbreak 1. Both ill food workers and three patrons submitted stool samples, all of which tested positive for norovirus genogroup II by RT-qPCR at DPH's State Public Health Laboratory.

During February 1–3, the FSE closed and implemented the following control measures: professional cleaning with a disinfectant effective against norovirus; retraining of food workers on handwashing, minimizing bare hand contact with food, and the ill food worker policy; supervision of food handling by a certified food inspector for four weeks; and, reporting of food worker illness to LHD for six months.

Norovirus Genotyping

Eleven norovirus-positive stool samples from the two outbreaks were sent to the New York State Wadsworth Laboratory for genetic sequencing. The laboratory was able to sequence two norovirus-positive specimens from the first outbreak (one food worker and one patron) and four norovirus-positive specimens from the second outbreak (one food worker and three patrons); all were genotyped as GII.P7–GII.6.

Figure 2. Self-reported date of illness onset among patrons and food workers — Outbreaks 1 and 2 at a Connecticut food service establishment, 2018–2019



Reported By

S. Jones PhD, J. Krasnitski MPH, Q. Phan MPH, Epidemiology and Emerging Infections Program; R. Wisniewski, T. Weeks, Food Protection Program; D. Noel, DPH Laboratory; Local Health Department Staff

Editorial

Two outbreaks of the same strain of norovirus occurred among patrons and workers at an FSE during December, 2018–January, 2019. A case-control study implicated salad as the likely vehicle for infection during the first

outbreak. However, multiple sources of contamination were likely involved. Ten food workers reported illness consistent with norovirus in December 2018, including three with vomiting or diarrhea while at work. Nationwide, 70% of reported norovirus outbreaks from contaminated food are caused by infected food workers (*2*).

Inadequate control measures after the first outbreak and ongoing food worker illness likely contributed to the second outbreak. It is unknown whether FSE employees used products effective against norovirus when performing environmental cleaning after the first outbreak. Despite recommendations from DPH and LHD, food workers were not retrained on handwashing, minimizing bare hand contact with food, or the ill food worker policy. Norovirus might have persisted on surfaces or have been reintroduced by ill food workers.

Lack of written ill food worker policies and paid sick leave and improper hand hygiene are important contributing factors in foodborne illness outbreaks (*3*). Before these outbreaks, FSE did not have a written ill food worker policy; 14 (26%) of 53 interviewed employees were unaware that they were required to report vomiting or diarrhea to their employer, and four employees worked while ill with vomiting or diarrhea. Employers in Connecticut with ≥50 employees are required to provide paid sick leave to service workers who meet certain criteria (*4*). Only three of 53 interviewed FSE employees reported that they received paid sick leave. Addressing gaps in food safety practices is crucial for outbreak prevention.

References

1. National Center for Environmental Health. National Environmental Assessment Reporting System. Centers for Disease Control and Prevention. 2017. https://www.cdc.gov/nceh/ehs/nears/index.htm
2. Hall AJ, Wikswo ME, Pringle K, Gould LH, Parashar UD. Vital signs: foodborne norovirus outbreaks - United States, 2009-2012. MMWR Morb Mortal Wkly Rep. 2014 Jun 6;63(22):491-5.
3. Lipcsei LE, Brown LG, Coleman EW, et al. Foodborne illness outbreaks at retail establishments — National Environmental Assessment Reporting System, 16 State and Local Health Departments, 2014–2016. MMWR.2019;68(No. SS-1):1–20.
4. Connecticut Department of Labor. Guidance from the Connecticut Department of Labor regarding Connecticut General Statutes §§ 31-57r – 31-57w — Paid Sick Leave. 2014. https://www.ctdol.state.ct.us/wgwkstnd/SickLeaveGuidance.pdf. Accessed March 7, 2019.

Investigation of a Norovirus Outbreak at a Summer Camp, Connecticut, 2018

In July, 2018, the Connecticut Department of Public Health (DPH) was notified of an outbreak of gastrointestinal (GI) illness among 70 campers at a Windham County overnight camp. Campers consumed meals prepared at the camp, and shared common sleeping areas and bathrooms. The DPH assisted the local health department (LHD) to determine the source and extent of the outbreak, and to implement control measures.

Epidemiologic Investigation

DPH staff developed a standardized questionnaire, which was administered by telephone or on-line using Survey Monkey®. A case was defined as vomiting and/or diarrhea (≥ 3 stools in a 24-hour period) in a camper or staff member with symptom onset July 20-21, 2018. Among the 70 attendees, 50 (71%) were interviewed or completed the online survey. Of these, 4 were excluded from analysis due to incomplete or conflicting responses. Among the 46 surveys included in analysis, 29 (63%) met the case definition. The median age of case-patients was 27 years (range 3–66), and 22 (76%) were female. Case-patients were residents of Connecticut (22) and Rhode Island (7).

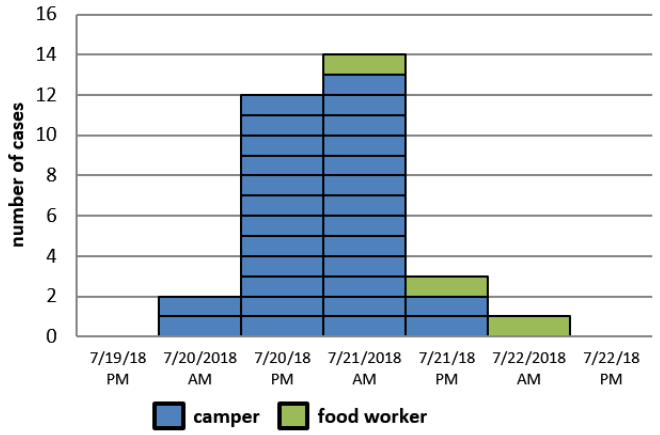
Onset of illness for cases ranged from July 20-July 21 (Figure). Of the 29 cases, 27 (93%) reported nausea, 23 (79%) vomiting and 20 (69%) diarrhea. Among the 27 case-patients who had recovered at the time of the interview, median duration of illness was 27 hours (range 8–120 hours). No hospitalizations or deaths were reported; 2 (7%) sought medical attention.

A case-control study was conducted to determine association of illness with food exposures. Multiple meals and food exposures were associated with illness including consumption of any foods at lunch on Thursday, July 19 [Odds Ratio (OR)=17.3; 95% Confidence Interval (CI)=1.63-184.36; *p*-value=0.01]; tater tots at lunch on Wednesday [OR=15.6; 95% CI=1.34-182.09; *p*-value=0.03]; spaghetti noodles at lunch on Thursday [OR= 8.05; 95% CI=1.69-38.44; p-value=0.02]; and spaghetti sauce at lunch on Thursday [OR=6.71; 95% CI=1.46 -30.72; p-value=0.02].

Laboratory Investigation

Stool samples, collected from 11 ill campers and 4 food workers (FWs) who prepared meals for the camp, tested negative for routine enteric bacterial pathogens (*Campylobacter, Escherichia coli* O157, *Salmonella*, and *Shigella*) at the DPH State Public Health Laboratory. All 11 campers and 3 FW specimens tested positive for norovirus (NoV) genotype II (GII). Seven (4 campers, 3 FWs) NoV GII positive samples were forwarded to the New

Figure: Epidemic curve of onset of GI illness at an overnight camp in Connecticut—July, 2018



York State Wadsworth Laboratory for sequencing; 3 (1 camper, 2 FWs) yielded sequence strain GII.P7-GII.7.

Environmental Investigation

The environmental investigation was conducted by staff of the LHD on July 23 and 24, 2018. On-site evaluation included interviews of FWs, collection of stool samples, evaluation of food handling practices, assessment of risk during active meal service, and distribution of educational materials. Two FWs reported GI illness consistent with onset of symptoms in campers, and a third FW denied illness. Investigators noted improper temperature controls (at the salad service area and at the hot service line), lack of proper sanitization of common items in between times of service (such as condiment bottles, salad dressing crocks, thermos containers, etc.), an overall absence of standard operating procedures, and allowance of campers and staff in the kitchen area.

Reported by

J Krasnitski, MPH, J Brockmeyer, MPH, Q Phan, MPH, T Rabatsky-Ehr, MPH, Epidemiology and Emerging Infections Program; C Costa, BS, Food Protection Program; C. Nishimura MPH, Diane Noel, BS, MT, State Public Health Laboratory, Connecticut Department of Public Health and Local Health Department staff.

Editorial

The epidemiologic, environmental, and laboratory evidence suggest that a foodborne outbreak occurred among overnight campers who attended a Windham County camp during July, 2018. Reported symptoms, duration of illnesses, and laboratory results were consistent with NoV. The tight clustering of date/time of symptom onset suggests this was a point-source outbreak. In this outbreak, eating multiple foods on multiple days, including tater tots, spaghetti noodles, or spaghetti sauce were all significantly associated with illness.

Results from the environmental investigation revealed insufficient standard food safety procedures to support safe food handling practices in the kitchen. The LHD implemented the following control measures: excluding ill FWs according to the time of resolution of symptoms, ensuring proper sanitization of kitchen and dining areas, ensuring proper hand washing measures, mandatory glove use with washing before donning gloves, and restricting non-FWs from the kitchen area.

Most GI outbreaks occurring in youth camp settings are due to person-to-person transmission. Foodborne transmission occurs less frequently, accounting for 17% of youth camp GI outbreaks reported to the Centers for Disease Control and Prevention during 2009 – 2016 (*1*). The most common factors that contributed to foodborne outbreaks were: improper timing or temperature control of food; consumption of raw/undercooked food; and food-handling by an infected food worker (*1*). Certain food safety practices would likely reduce the risk of illness at summer camps. These practices include: ensuring campers, staff and FWs are trained in food safety practices; restricting ill campers, staff and FWs from the food service areas until at least 48 hours after their GI symptoms have resolved; and assuring that campers, staff and FWs do not cook with or consume untreated water (*2*). Additionally, access to the kitchen area should be restricted only to individuals involved in food preparation who have received proper food safety training.

References

1. Kambhampati AK, Marsh ZA, Hlavsa MC, et al., Prevention and Control of Youth Camp–Associated Acute Gastroenteritis Outbreaks, *Journal of the Pediatric Infectious Diseases Society*, piy068, https://doi.org/10.1093/jpids/piy068
2. CDC. Healthy Camping: Norovirus Prevention at Youth Camps. https://www.cdc.gov/norovirus/infographics/fs-healthy-camping-norovirus-508.pdf. Accessed March 8. 2019.