

Outbreak of Norovirus Associated with Martinelli's Little Italy — Saline County, June 2013



Background

On Sunday, June 2, 2013 at 6:36 p.m., the Salina-Saline County Health Department (SSCHD) received a call from Salina Regional Health Center (SRHC). SRHC reported that a patient in the emergency department was ill with gastrointestinal symptoms, and the patient knew of several others ill with similar symptoms who presented to Abilene Memorial Hospital. All the ill individuals attended a rehearsal dinner at Martinelli's Little Italy Restaurant (158 S Santa Fe, Salina, KS, 67401) on May 31, 2013, and a wedding reception held at a different Salina location on June 1, 2013. SSCHD contacted the Kansas Department of Health and Environment's Infectious Disease Epidemiology and Response section (KDHE) at 7:29 p.m. to report the possible outbreak.

The following morning, SSCHD, KDHE, and the Kansas Department of Agriculture (KDA) began an investigation to determine the cause and scope of illness, and to implement prevention and control measures.

Methods

SSCHD worked with representatives from the wedding to obtain a schedule of events, a list of attendees, and their contact information. A subset of attendees ate at Martinelli's Little Italy Restaurant on May 31 at approximately 7:00 p.m. The wedding reception (including a dinner) was held at another Salina location on the following evening, June 1.

On June 3, SSCHD sent a fax to Saline County clinics, asking physicians to report patients with gastrointestinal illness who ate at either location associated with the potential outbreak.

A retrospective cohort study was conducted among those who attended the rehearsal dinner, the wedding reception, or both events. An online questionnaire was developed and distributed via email to obtain attendees' demographic information, symptom history, and food history. A

paper version of the questionnaire was mailed to attendees with an unknown email address. Questionnaire administration began on June 6 and was completed on June 21. A case was defined as any individual experiencing vomiting or diarrhea (three or more loose stools in a 24-hour period) within 50 hours of eating food purchased from Martinelli's Little Italy on May 31, 2013. Individuals who reported onset of vomiting or diarrhea more than 50 hours after the rehearsal dinner were classified as secondary cases.

Odds ratios (ORs) and 95% confidence intervals were calculated, and associations between illness and food exposures were assessed using the Chi-square test. Statistical analysis was conducted using SAS[®] software (Release 9.2, Cary, North Carolina).

One stool specimen was collected through SSCHD and shipped to the Kansas Health and Environmental Laboratories (KHEL) for norovirus testing via polymerase chain reaction (PCR). An additional five stool specimens were collected by area physicians, and two were shipped to KHEL for norovirus testing. These five stool specimens were collected from four wedding event attendees.

During the course of the investigation, SSCHD was notified of two other groups who experienced gastrointestinal illness after eating at Martinelli's Little Italy on May 31. One group of two individuals picked up a salad and ate it at a private residence; one individual became ill and presented to a Salina physician on June 4. The physician contacted SSCHD as directed by the faxed alert, and collected a stool specimen for norovirus testing at KHEL. The second group consisted of four individuals; a representative contacted SSCHD via telephone on June 7 to complain about the restaurant and report their illnesses.

KDHE notified KDA about both wedding-related locations on June 3. An inspection of Martinelli's Little Italy was conducted on June 4; the reception site was inspected on June 5. Questionnaires were distributed by SSCHD to staff at Martinelli's Little Italy to identify any illnesses among food handlers.

Results

Of the estimated 200 individuals who attended the wedding events, 125 (approximately 63%) individuals representing 64 separate households completed the questionnaire. Kansas residents comprised 83% of the respondents (n=104); the remaining individuals resided in Washington D.C. and the following states: Arizona, Colorado, Hawaii, Illinois, Massachusetts, Missouri, Nevada, and Texas. No one reported gastrointestinal illness prior to June 1. All reported attending the wedding reception, while 60 reported also attending the rehearsal dinner. Thirty-

four individuals reported becoming ill after attending the wedding events; 28 met the case definition, and five individuals were classified as secondary cases.

Cases ranged in age from 1 to 84 years (median age, 42.5 years). Eighteen (64%) cases were female.

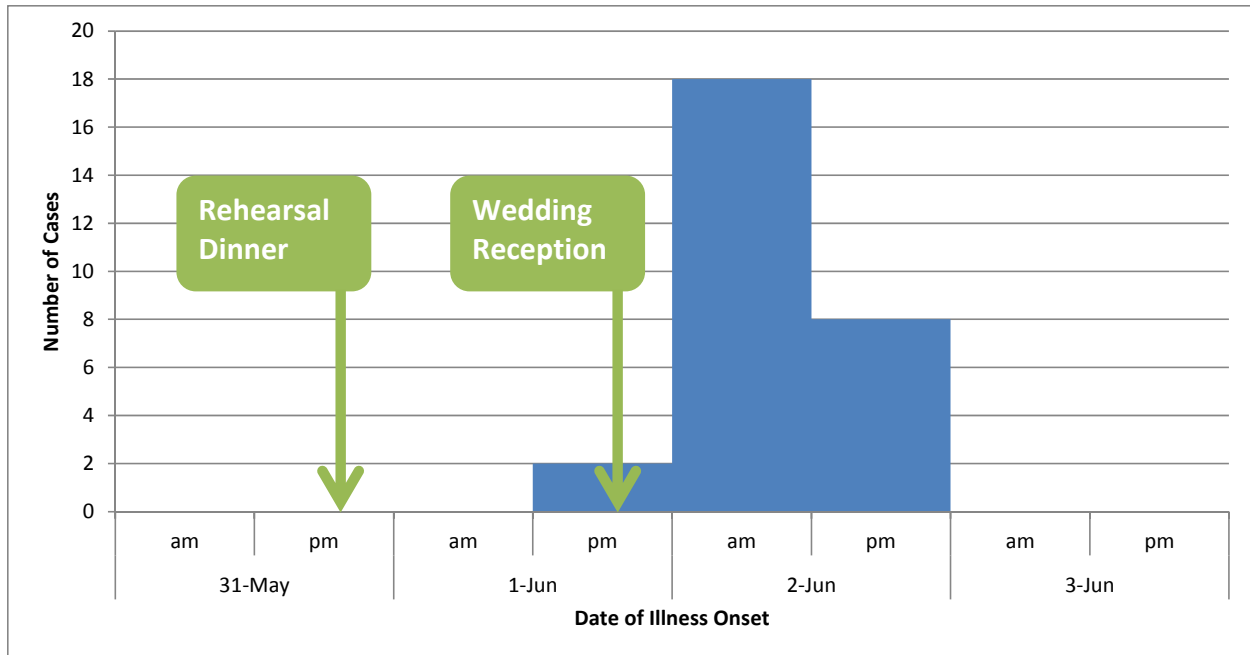
Vomiting and diarrhea were the most commonly reported symptoms. Cases also reported nausea, muscle aches, abdominal pain, and fever (Table 1).

Table 1: Clinical information for cases (n=28)

<i>Symptoms</i>	<i>Cases with Symptoms (%)</i>	
Vomiting	22	(79%)
Diarrhea	22	(79%)
Nausea	20	(74%)
Abdominal Cramps	18	(67%)
Muscle Aches	15	(56%)
Fever	15	(56%)

The illness incubation time was calculated using the rehearsal dinner time of 7:00 p.m. on May 31. Incubation times ranged from 28 to 47 hours. The median incubation period was 36.125 hours (Figure 1).

Figure 1: Illness incubation time for cases (n=28)



The duration of illness was reported for 20 (74%) cases, and ranged from 6 to 323.5 hours (median length, 57.25 hours).

One case reported visiting a physician, and three reported visiting an emergency department. One secondary case reported visiting an emergency department. No hospitalizations were reported.

All items served at the rehearsal dinner and the wedding reception were analyzed for statistical association with illness. Those who attended the rehearsal dinner were 15.6 times as likely to become ill compared to those who did not attend the rehearsal dinner (OR=15.6, p-value <0.0001, 95% confidence interval=4.4 – 55.8). Consuming salad at the rehearsal dinner (OR=15.8, p-value=0.0109, 95% confidence interval=0.9 – 287.2) was also associated with illness. Attending the wedding reception or eating any food or drink at the reception was not associated with illness.

Of the five stool specimens collected among wedding event attendees, two tested negative for enteric bacteria at an area hospital. The remaining three specimens tested positive for norovirus at KHEL; each specimen was from a different individual. One positive specimen was collected from a secondary case.

The two other groups who ate food from Martinelli’s Little Italy reported incubation periods and gastrointestinal symptoms similar to the wedding event attendees. One of two individuals

who ate a takeout salad reported illness, and tested positive for norovirus and negative for enteric bacteria at KHEL.

The June 4 restaurant inspection by KDA revealed two priority violations and two priority foundation violations: dried food on kitchen knives, an inaccurate make table thermometer, bread stored in non-food-grade bags, and macaroni salad held above the required cold holding temperature threshold. KDA returned to the establishment on June 26 to provide education on norovirus.

Eight employee surveys were returned to SSCHD — no gastrointestinal illness was reported among these employees.

Conclusions

Twenty-eight cases and five secondary cases of gastroenteritis were associated with consuming food at a wedding rehearsal dinner at Martinelli's Little Italy on March 31. Additionally, five others reported gastroenteritis after consuming food from the restaurant on that evening. Norovirus was confirmed as the causative agent among three individuals who attended the wedding rehearsal dinner and one individual who was not related to the wedding group. The symptoms, incubation time, and duration of illness reported are consistent with norovirus infection.

Although the restaurant was associated with illness, the vehicle of transmission could not be confirmed. The salad served at the wedding rehearsal dinner was statistically linked with illness; however, of the two other groups who ate food from the restaurant that evening, one consumed salad and one did not. Multiple menu items may have been contaminated with norovirus.

Norovirus is a highly contagious pathogen with a very low infectious dose, estimated to be between 10-100 viral particles¹. Transmitted primarily through the fecal-oral route, norovirus particles may be spread through direct contact or through consuming fecally-contaminated food or water. Spread via aerosolized vomitus is also possible. The incubation period is normally 24 to 48 hours, and can range from 10 to 50 hours.² Once infected, norovirus shedding can begin prior to the onset of symptoms and can persist for weeks after clinical symptoms have ceased. Norovirus has been detected in fecal specimens 3 to 14 hours before the onset of clinical symptoms and could be detected for 13 to 56 days after exposure to the virus³. Approximately 20% of norovirus infected individuals do not have clinical symptoms⁴. However, these individuals can still shed norovirus and can be potential sources of contamination.

Investigations of foodborne norovirus outbreaks have implicated multiple food items, including oysters, salads, sandwiches, cakes, frosting, raspberries, drinking water, ice, and other food items that were contaminated after cooking or that were ready to eat⁵.

The epidemiological investigation was limited by several factors. First, the scope of illness was not fully determined. More extensive case finding, such as the use of credit card receipts to identify additional individuals who dined at the restaurant, could have been useful in determining the full extent of the outbreak. Inaccuracies may be present in interviewees' food and symptom histories due to recall bias.

This investigation was aided by SSCHD's communications to area physicians, which allowed for the identification of an affected individual outside of the wedding group, as well as the collection of additional stool specimens for norovirus testing. The use of an online questionnaire, in combination with a mailed questionnaire, allowed for a good response rate while minimizing the staff time required for the investigation. Because of initial uncertainty as to which wedding event was the source of illness, two inspections had to be conducted. KDA conducted both inspections within 48 hours of notification.

*Report by: Daniel Neises, MPH (Kansas Department of Health and Environment)
On: June 25, 2013*

Investigation by:

Salina-Saline County Health Department

148 N. Oakdale
Salina, KS 67401

<http://www.sschd.org/index.html>

**Kansas Department of Agriculture
Division of Food Safety and Lodging**

109 SW 9th Street, 3rd Floor
Topeka, KS 66612

http://www.ksda.gov/food_safety/

**Kansas Department of Health & Environment
Bureau of Epidemiology and Public Health Informatics**

1000 SW Jackson St., Suite 210
Topeka, Kansas 66612

<http://www.kdheks.gov/>

¹ Teunis PFM, Moe CL, Liu P, et al. Norwalk virus: how infectious is it? *J Med Virol* 2008; 80:1468-76.

² Heymann D, editor. *Epidemic Viral Gastroenteropathy. Control of Communicable Diseases Manual*. 19th Ed. Washington, DC: American Public Health Association, 2008. 256-258.

³ Atmar RL, Opekum AR, Gilger MA, et al. Norwalk virus shedding after experimental human infection. *Emerg Infect Dis* 2008; 14:1553-1557.

⁴ Moe CL. Preventing norovirus transmission: How should we handle food handlers? *Clin Infect Dis* 2009; 48:38-40.

⁵ CDC. Norwalk-like viruses, Public health consequences and outbreak management. *MMWR* 2001; 50(RR09):1-18.