Outbreak of *Salmonella* Thompson Associated with a Church Event — Crawford County, August 2014

Background

On Monday, August 18, 2014, at approximately 9:00 a.m., Via Christi Hospital in Pittsburg, Kansas (VCH-P) notified the Crawford County Health Department (CCHD) of a possible foodborne outbreak. CCHD notified the Kansas Department of Health and Environment's Infectious Disease Epidemiology and Response section (KDHE) at 9:40 a.m. that same day. Five Hispanic patients from two different households sought care in the emergency department that Sunday night after eating food served at a local church event on Saturday evening. Food served at the event was provided by church members. No other common exposures between the households were reported.

KDHE and CCHD conducted an investigation to determine the cause and scope of illness and to implement prevention and control measures.

Methods

Epidemiologic Investigation

Hospital records were reviewed on August 18th. Face-to-face and telephone interviews were conducted by CCHD with a spokesperson and with ill persons among attendees of the event on August 18th and 19th. Because many individuals could not be contacted by phone, home visits with a Spanish interpreter were required. Three of those contacted lived in other states; two were from Oklahoma and one was from Texas. To identify additional cases, a survey was prepared in Spanish to ask individuals about symptoms. The survey was distributed to church attendees the weekend of August 24th. The surveys were returned to the health department on September 9th. A case was defined as diarrheal illness in an event attendee within seventy-two hours of eating food served at the church event on August 16th at 7:00 PM.

Environmental Assessment

The spokesperson who distributed and collected surveys also provided information on what was served, how it was handled, and if any items were available for testing.

Laboratory Assessment

Six stool specimens were collected for culture and analysis: three were tested at VCH-P, two were collected by the CCHD for testing at the Kansas Health and Environmental Laboratories (KHEL), and one specimen was tested at an Oklahoma hospital. *Salmonella* bacteria isolates from the specimens were sent to KHEL for serotyping and Pulsed-field gel electrophoresis (PFGE); the Oklahoma isolate was analyzed by PFGE at the Oklahoma State Department of Health. KHEL staff uploaded the PFGE pattern identified with the outbreak into the national PFGE database (PulseNet) and posted information about the Kansas cluster on the PulseNet USA SharePoint site.

A commercially packaged horchata mix was the only food item available for testing. It was collected by CCHD on August 22nd and shipped to KHEL on August 26th. Testing of the mix for *Salmonella* as outlined by methods in FDA's Bacteriological Analytical Manual (BAM)[1] was started on September 3rd and completed on September 16th.

Results

Epidemiologic Investigation

CCHD initially interviewed 10 individuals, of whom 9 reported illness. Four additional individuals were identified through chart review at VCH-P. Seventeen of 60 individuals (28%) responded to the survey with all seventeen reporting illness.

Overall, 30 individuals attending the event reported illness and met the case definition.

Ill persons ranged in age from 3 to 58 years (median age, 28 years); 16 (53%) were female.

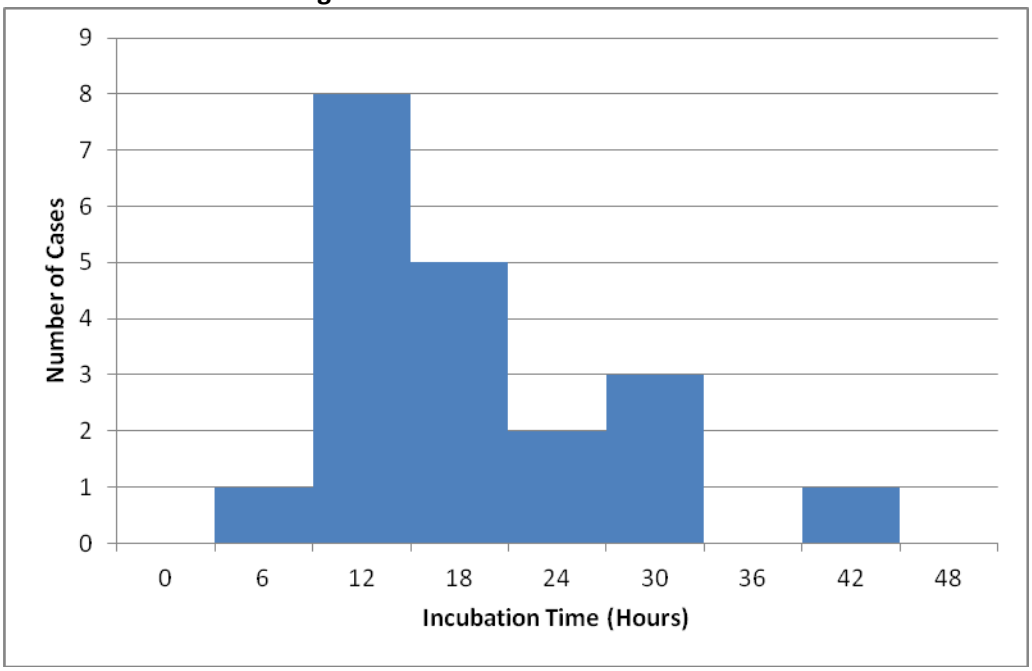
Diarrhea was the most commonly reported symptom (Table 1). Additional symptoms reported were abdominal pain, headache, nausea, fever, muscle aches, vomiting, loss of appetite, chills, and bloody diarrhea. One person required hospitalization. Five persons reported seeking care in a hospital emergency department. Three persons reported seeking an unknown level of medical care.

Table 1: Clinical information for cases (n=30)

Symptoms	*Cases with Symptom Reported (%)*	
Diarrhea	30	(100 %)
Abdominal Pain	25	(83%)
Headache	22	(73%)
Nausea	21	(70%)
Fever	21	(70%)
Muscle Aches	18	(60%)
Vomiting	17	(57%)
Appetite Loss	14	(47%)
Chills	12	(40%)
Bloody Diarrhea	1	(3%)

No individuals reported illness prior to the event. The time of illness onset was available for 18 cases. The illness incubation time ranged from 8 hours to 46 hours (median, 19 hours) (Figure 1). Eleven cases had recovered from their illness at the time of their interview. The duration of illness ranged from 1 day to 8 days (median, 4 days).

Figure 1: Illness incubation time of gastrointestinal illness cases associated with church event (n=20)



The initial assessment of foods consumed revealed that all individuals were provided the same items to eat. Two differences were noted. The one non-ill individual had consumed all items with the exception of shredded cheese and an ill individual reported consuming nothing but the horchata mix on ice that was served at the meal.

Environmental Assessment

Food and drink items were examined in the initial interviews but not analyzed for association with illness as initial information indicated that all attendees were served the same meal. The spokesperson reported that tostados were served at the event. The tostados consisted of a packaged or homemade tortilla with homemade refried beans, homemade salsa with cilantro, chopped lettuce and tomatoes, and prepackaged shredded cheese . A drink of horchata made from powdered mix was served with ice. The horchata mix consisted of rice flour, dried skim milk, cinnamon and sugar. The refried beans, salsa, and some of the tortillas were prepared at private homes and brought to one of the smaller church kitchens. These items were all cooked prior to serving with the exception of cilantro being added to the salsa after cooking and the lettuce and tomatoes that were chopped and then washed in the church kitchen prior to serving. Food items were obtained the Friday prior to the event from national grocery outlets.

Volunteers prepared the tostados on individual plates while wearing gloves and distributed them to the attendees. The horchata mix was prepared with water from the church kitchen and stored in a 5 gallon beverage container. Ice was obtained from the facility's ice machine. During the time period of interest, two additional events occurred which utilized the same ice machine and water. No gastrointestinal illness was associated with either of these events.

Laboratory Assessment

Salmonella Thompson was isolated from the six stool specimens. The isolates were indistinguishable by PFGE. The PFGE results were sent to the Centers for Disease Control and Prevention and were identified as PFGE pattern JP6X01.0009. Two additional *Salmonella* isolates from Crawford County individuals not associated to the event were sent to the KHEL during the time period of interest; one from VCH-P and another from Mercy Hospital in Fort Scott, Kansas. These *Salmonella* isolates were not serotype Thompson, and were not associated with the outbreak.

No *Salmonella* Thompson outbreaks were in progress in the U.S. when this outbreak was reported. Oklahoma was the only state to contact KDHE of a matching PFGE pattern that was identified in the hospitalized Oklahoma resident who did attend the church event.

Test results of horchata mix testing indicated that no *Salmonella* was found. No other food was available for laboratory testing.

Conclusions

This was an outbreak of *Salmonella* Thompson associated with a Hispanic community event in Crawford County. The outbreak was identified and reported by the local hospital emergency department. The epidemiologic and clinical data collected for this outbreak are consistent with a point-source outbreak associated. Thirty of approximately 60 attendees became ill with diarrheal symptoms after attending the event. Those who became ill had consumed food or drink at the event on August 16th, with the majority of the individuals reporting onset of illness on August 17th.

Although the event was associated with illness, the vehicle of transmission could not be confirmed. Five uncooked and ready-to-eat food items could potentially be associated with illness; tortillas, cilantro (added to salsa after cooking), lettuce, tomato, and horchata drink. While no one food item could be associated with illness and no *Salmonella* was isolated in the horchata mix, it is plausible that the fresh produce or drink served to the ill attendees was contaminated prior to purchase and preparation or that the tortillas, drink, or produce was contaminated during preparation and handling.

Salmonella is estimated to cause more than 1.2 million illnesses each year in the United States, with more than 23,000 hospitalizations and 450 deaths[2]. Those infected with *Salmonella* will usually develop diarrhea, fever, and abdominal cramps 12–72 hours after infection. Illness generally lasts 4 to 7 days, but infants, the elderly, and those with weakened immune systems are more likely than others to develop severe illness[3].

Raw, contaminated produce is a recognized vehicle for transmission of *Salmonella*[4,5]. Outbreaks have also been noted with low moisture foods such as commercial cereal products[6] and powdered milk products as *Salmonella* spp. are relatively resistant to drying and can survive for long periods of time in dry environments[7].

Salmonella Thompson has been associated with past outbreaks involving cilantro added to salsa[8] , rucola lettuce[9], and an ill foodhandler packaging buns to be sent to restaurants[10]. *Salmonella* Thompson has also been shown to be more resistant to heat storage then *S.* Typhimurium in studies with dried milk[11].

The epidemiological investigation was limited by not collecting food histories from every attendee and by the low response rate to the written survey.

The investigation's strengths were the local hospital's quick reporting, good working relationship with CCHD, and the availability of PulseNet to identify cases that were associated with the outbreak in the same community as well as to communicate the outbreak's PFGE pattern nationally to determine if additional outbreaks associated with the same strain of

Salmonella Thompson were occurring in other states. CCHD's use of an interpreter and home visits did help to overcome the language barrier and collect vital information, but the method was resource intensive and could not be applied with every household. Public health actions were also initiated quickly by CCHD. CCHD oversaw emptying and cleaning of the church's ice machine and recommended a review of the church's food preparation processes to identify critical control points that can be corrected for future events.

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