Gastrointestinal Illness Investigation Related to a Pot-Luck style Dinner

Harris County Public Health
Building a Healthy Community

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ABSTRACT

Background: ●n July 15th, 2011 HCPH Epidemiology Program received a report that six employees of a company factory had been transported to a local hospital ER with food poisoning, after a potluckstyle party. **Methods.** Food inspectors and epidemiologists visited the company on the evening of July 15th. Twenty-six employees including four individuals who had provided food for the event were interviewed. An inspection of the employee kitchen and dining areas was conducted. An additional thirty-one telephone interviews were conducted by epidemiology staff from July 18th through July 20th. In total, information was collected from fifty-seven individuals. **Results:** The attack rate was 53%, the med an incubation period was 3 hours, and the median duration of illness was 5 hours. The median age was 31 years. Maes were 70% of the respondents and 77% of the cases. All cases (100%) had diarrhea and 63% had vomiting. Clinical specimens were positive for *Staphylococcus aureus* and staph toxin. Fried rice was positive for staphylococcal enterotox n. The data suggests that individuals who ate fried rice had twice (RR 2.07, 95% CI 1.07, 3.98) the risk of developing a gastrointestinal illness compared to those who did not eat fried rice and the risk was almost double (RR 1.96, 95% CI 1.22, 3.15) for individuals who ate pork chops compared to those who did not eat pork chops. **Conclusion**: This event was a common source outbreak of *Staphylococcus aureus* enterotoxin gastroenteritis. ●ne or more poor food handling practices were identified that could be possible contributors to this foodborne illness outbreak

BACKGROUND

The investigation by HCPH epidemiology staff determined that the ill employees worked the night shift at the company factory. The shift hours were from 10:30 pm to 6:30 am. A potluck-style party had been held to celebrate the departure of one of the employees on July 15th. The following items were served at the potluck: pork and shrimp spring rolls, a sauce for the spring rolls, fried rice, pork chops, nachos with cheese, salsa, and jalapenos, chocolate "dream" cake, "plain" cake, vanilla and chocolate ice cream, and drinks in a cooler. The meal began at 2:30 am. Most of the food was served and consumed by 3:00 am. A food inspector from HCPH Environmental Public Health transported the food samples to the Houston Department of Health and Human Services, Bureau of Laboratory Services for testing. The food samples were unrefrigerated and measured at an internal temperature of 77°F at time of pick-up. Two food inspectors from Environmental Public Health and three epidemiologists visited the company on the evening of July 15th. Twenty six employees were interviewed by the epidemiologists. The food inspectors interviewed four individuals who had provided food for the event and conducted an inspection of the employee kitchen and dining areas. An additional thirty-one telephone interviews were conducted by epidemiology staff from July 18th through July 20th. The epidemiologists received reports that between 50 and 70 employees may have participated in the party but were unable to confirm the actual number. In total, information was collected from fifty seven participants

METHODS

- Development of interview tool using Microsoft Publisher.
- Site visit by a team of epidemiologists and food inspectors
- Interviews of the potluckstyle party participants (26 on site and an additional 31 phone interviews)
- Development of line list using Microsoft Excel
- Data analysis using Stata Version 11
- Collection and transport of food samples from Company A to public health laboratory by a certified sanitarian
- Reporting of findings
- Recommendations given to the appropriate parties involved in this outbreak

RESULTS TABLES/GRAPH

Table 1. Demographic Information of HP employees who participated in party and we reinterviewed

	Participants N=57	Ill N=30
Age,		
Median Age	35	31
Range	19 - 62	19 – 62
Missing Age, count	3	1
Gender, count/%		
Males	40/70	23/77
Females	17/30	7/23
Unit Name, count/%		
Run in (pre test)	32/56	17/57
Assembly (builder, repair)	24/42	13/43
Other building	1/2	0

Table 2. Symptom profile of cases and other clinical characteristics

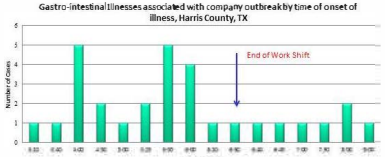
Attack rate	53%
Incubation Period	
Median time	3 hours
Range	10 minutes – 6.5 hours
Duration of Illness	
Median time*	5 hours
Range	1 – 73 hours
Symptoms, count/%	
Diarrhea	30/100
Abdominal pain	25/83
Nausea	21/70
Vomiting	19/63
Head ache/body ache	13/43
Fever	9/30

*This duration excludes five individuals that were unable to state a specific time when their symptoms ended. Three individuals indicated an approximate time; including those, the median increased to almost 8 hours duration. The range didn't change.

Table 3. Food-specific attack rate, risk difference, risk ratio with 95% Confidence Interval (CI) and p values

	Ate/drank			Did not eat/drink					
	Ill: No	Not Ill: No	Attack Rate %	Ill: No	Not Ill: No	Attack Rate %	Risk Difference	Risk Ratio 95 % CI	P-value
Food/Beverages									
Shrimp spring roll	23	21	52	7	6	54	-2	0.97 (0.55, 1.73)	1.000
Pork spring roll	24	14	63	6	13	32	-31	2.00 (1.009, 4.03)	0.0475*
Either spring roll	29	20	59	1	7	13	-47	4.73 (0.73, 30.0)	0.0218*
Pineapple sauce	16	10	62	14	17	45	-16	1.36 (0.85, 2.23)	0.2891
Pork chops	16	7	70	14	20	41	-29	1.69 (1.04, 2.74)	0.0528
Pork chops†	16	5	76	14	22	39	-37	1.96 (1.22, 3.15)	0.0123*
Fried rice	23	13	61	7	12	37	-24	1.65 (0.95, 3.12)	0.1050
Fried rice†	23	12	66	7	15	32	-34	2.07 (1.07, 3.98)	0.0108*
Nachos	23	20	53	7	7	50	-3	1.07 (0.59, 1.94)	1.000
Salsa	17	12	59	13	15	46	-12	1.26 (0.76, 2.09)	0.4309
Jalapenos	8	9	47	22	18	55	-8	0.86 (0.48, 1.52)	0.7725
Dream cake	7	11	39	23	16	59	-20	0.66 (0.33, 1.24)	0.2535
V anilla cake	18	14	56	12	13	48	-8	1.17 (0.70, 1.95)	0.5985
Choco ice cream	12	9	57	18	18	50	-7	1.14 (0.70, 1.87)	0.7839
Vanilla icecream	9	13	41	21	14	60	-19	0.68 (0.39, 1.21)	0.1837
Drinks from cooler	21	13	62	9	14	39	+23	1.58 (0.89, 2.80)	0.1115

Gastro-intestinal Illnesses associated with company outbreak by time of onset of illness, Harris County, TX



RESULTS

Table 1 summarizes the characteristics of the employees for whom information is available. The majority of the illnesses (77%) occurred before the end of the work shift. A graphical representation of this information is included, "Gastrointestinal Illnesses associated with company outbreak by time of onset of illness." Thirty individuals who participated in this party developed a gastrointestinal illness, which indicates an attack rate of 53%. Case-patient ages range from 19 years to 62 years, with a median of 31 years (N=30). Males were 70 percent of the respondents and 77 percent of the cases. Most of the respondents (56 %) were from the "run in" unit of the company; however, employees from other areas also participated in the party and developed symptoms. Diarrhea and vomiting were required symptoms for an individual be included as a case. All of the cases (100%) had diarrhea and 63% had vomiting. The illnesses were self limiting lasting about five hours in most individuals. The duration of illnesses ranged between 1 and 73 hours. Table 2 summarizes the symptoms reported by the cases.

Three stool specimens were provided for testing. All three were positive for *Staphylococcus aureus* and *Staphylococcus* enterotoxin; two of the three were also positive for Norovirus. All three specimens were negative for *Bacilluscereus, Salmonella, Shigella, Yersinia, Vibrio, Campylobacter* and *E. coli*. Norovirus tests were performed by the hospital contract laboratory, other bacterial testing was conducted by the Texas Department of State Health Services laboratory. *Staphylococcus* enterotoxin was performed in the laboratory at the Centers for Disease Control and Prevention (CDC).

RESULTS

The results of the food testing are as follows: the sample of fried rice was positive for staphylococcal enterotoxin and the sample of pork chops tested negative for the same toxin. Food testing was conducted by the Houston Department of Health and Human Services, Bureau of Laboratory Services.

The most significant findings related to eating pork chops and fried rice, particularly when individuals who only had one bite are excluded from the analysis. The data suggests that individuals who ate fried rice had twice (RR 2.07, 95% CI 1.07, 3.98) the risk of developing a gastrointestinal illness compared to those who did not eat fried rice. Additionally, the risk of developing illness was almost double (RR 1.96, 95% CI 1.22, 3.15) for individuals who ate pork chops compared to those who did not eat pork chops.

Considering all results including the outcome of the food specimen tests, the clinical specimen tests and the data analysis it is concluded that a toxin mediated foodborne illness occurred as a result of the potluck party on July 15th 2011 at this company. ●ne or more poor food handling practices were identified that could be possible contributors to this foodborne illness outbreak. The symptoms presented by the ill individuals, as well as the incubation period and the duration of illness are all representative of staph intoxication. The sample of fried rice as well as the clinical specimens tested positive for Staph toxin and *Staphylococcus aureus* was isolated from three clinical specimens.

SUMMARY

The data presented in this summary is consistent with toxin mediated illness particularly *Staphylococcus aureus* enterotoxin, the organism identified in three of the cases and the toxin present in one food sample. *Staphylococcus aureus* produces toxins that cause self-limited gastroenteritis with a very short incubation period, 30 minutes to 5 hours, and of short duration, usually 24 to 48 hours.

Risk factors for *Staphylococcus aureus* intoxication are: storing cooked foods at room temperature, preparing foods several hours before serving, touching cooked foods, and holding foods at warm bacteria-incubation temperatures. ●ne or more of these practices were identified in this outbreak and could be considered possible contributors to this foodborne illness outbreak.

In general, the sample of respondents was small and with such a small number of participants it is difficult to obtain conclusive information from the data analysis. It is important to note that most individuals ate most of the food items offered, which often happens in potluck events, making it difficult to tease out the effect of some food items on other items. Also it is important to note that toxins are not spread evenly over contaminated food making it possible that individuals were exposed to the food but did not develop symptoms. This a so supports the creation of a variable which excluded individuals who reported eating only one bite, because they may have been less likely to be exposed to the toxin.

CONCLUSIONS

Considering all results including the outcome of the food specimen testing, the clinical specimen testing and the data analysis it is concluded that a toxin mediated foodborne illness occurred as a result of the potluck party on July 15th 2011 at Company A. ●ne or more poor food handling practices were identified that could be possible contributors to this foodborne illness outbreak. The symptoms presented by the ill individuals as well as the incubation period and the duration of illness are all representative of staph intoxication. The sample of fried rice tested positive for Staph toxin and as did the clinical specimens. *Staphylococcus aureus* was isolated from these three clinical specimens. Regardless of the problems presented by the small sample size, fried rice was clearly a risky food item as were the pork chops.

In conclusion, this epidemiological investigation established that this event was a common source outbreak of *Staphylococcus aureus* enterotoxin gastroenteritis. ●verall, this was a very successful investigation. ●ur department overcame many barriers to obtain permission from the company and its legal team to conduct the field investigation on Friday night, the same day of the event. By interviewing participants quickly after the party we were able to reduce recall bias and obtain better food and clinical histories. ●ur presence at the worksite allowed us to get first hand information regarding the potluck party and the food preparation by conducting face to face interviews with the primary food handlers and party attendees. Food handlers received one on one education about the proper way of preparing food including keeping food at the right temperatures.

REFERENCES

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HCPH Epidemiological Data Files