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Multipathogen Gastrointestinal Illness Outbreak in Hospital Staff — Alaska, 2021

Introduction

Clostridium perfringens, an anaerobic spore-forming bacterium, is a common cause of foodborne illness.¹ Infection with *C. perfringens* is typically characterized by diarrhea and abdominal cramps with symptom onset occurring within 6–24 hours of consuming contaminated food.¹ *Bacillus cereus* (*B. cereus*), an aerobic spore-forming bacterium, can cause both diarrheal and emetic illnesses. Typically, symptom onset is within 6–24 hours and 1–6 hours of consuming contaminated food, respectively, for diarrheal and emetic types.²

On August 6, 2021, the Section of Epidemiology (SOE) was notified of a possible foodborne outbreak among staff at South Peninsula Hospital (SPH), Homer. Preliminary reports revealed that ill staff had received preordered takeout food from a local food vendor. SOE began an investigation in collaboration with the Alaska Department of Environmental Conservation (DEC), Food Safety and Sanitation Program and SPH.

Methods

Epidemiologic Investigation

An online survey was distributed by text message to all SPH staff (n=515) at 5 pm on August 6 and used to obtain demographic information, illness characteristics, and foods consumed. A case-control study determined risk factors for illness. Case-patients were defined as any SPH staff who reported acute gastrointestinal illness (e.g., diarrhea, abdominal pain, or cramping) with symptom onset from noon on August 5 until the survey closed on 10 am on August 12. Control persons were any SPH staff without gastrointestinal symptoms. Odds ratios were calculated for risk factors.

Environmental Investigation

DEC performed a food safety investigation at the vendor site. Disinfection, food processing, and handling procedures were reviewed. Environmental samples of left-over foods consumed by hospital staff on August 5 were obtained from SPH.

Laboratory Investigation

Five stool samples from cases were sent to the Enteric Diseases Laboratory Branch at the US Centers for Disease Control and Prevention. Left-over food samples obtained from hospital staff were sent to the Washington State Public Health Laboratory.

Results

Epidemiologic Investigation

Sixty-six ill case-patients and 136 controls were enrolled into the case-control study; 97% of case-patients (n=64) reported consuming a ham and pork sandwich versus 11% of controls (n=15). From univariate analysis the odds of having consumed a sandwich was 258 times higher among case-patients versus controls (odds ratio: 258; 95% confidence interval [CI]: 57.2–1164.1). The only other food item with a statistically significant increased risk for illness was the broccoli salad (odds ratio: 2.1; 95% CI: 1.0–4.3). The most frequently reported symptoms among case-patients were diarrhea (96%), abdominal pain or cramping (94%), and nausea (54%). No case-patients reported hospitalization. One case-patient reported seeking care from a healthcare provider. Based on survey findings, the median incubation period from the time of sandwich consumption to symptom onset was 8.5 hours (Figure). The exact time of consumption by individuals was not collected. Because the food was served at a staff luncheon starting at 11:30 am, a proxy time of noon on August 5 was used as the time of consumption for analysis purposes.

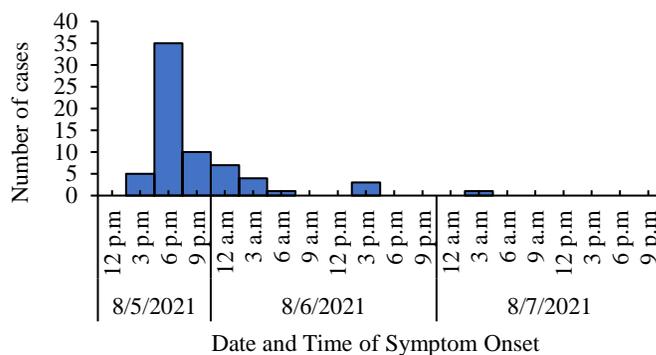
Environmental Investigation

The sandwich was found to be made specifically for SPH staff and not sold publicly, limiting further exposure. No clear deficiencies were observed in food storage, processing, or handling procedures of the implicated food at the vendor site. However, anecdotal reports of a lack of temperature control after the foods were prepared and awaiting collection from the vendor site were noted. The environmental health officer addressed cooling and cold holding practices with the vendor who fully cooperated with the investigation and later follow-up.

Laboratory Investigation

Both *C. perfringens* and *B. cereus* were isolated from two left-over sandwich samples. *C. perfringens* enterotoxin detection performed on stool samples is still pending. *B. cereus* was also isolated from the broccoli salad dish prepared at the same establishment but did not meet the infective dose level required for human health hazard.³

Figure. Cases of Acute Gastrointestinal Illness at SPH, Onset Date and Time — Alaska, 2021



Discussion

Epidemiologic and laboratory data provide strong evidence that this acute gastroenteritis outbreak was linked to consumption of prepared ham and pork sandwiches and attributable to infection with *C. perfringens* and *B. cereus*. Quick notification of this outbreak and efficient collaboration among partners and the vendor were key to the successful response and mitigation of any further risk. Because the sandwich was prepared for hospital staff exclusively, ongoing infection risk to the public was deemed low. State officials are working with the establishment to ensure implementation of recommended food safety measures going forward.

Recommendations

1. Cook, refrigerate, or freeze meat, poultry, eggs, and fish within 2 hours. Cook to a safe temperature before eating.⁴
2. If cooked food will not be consumed immediately, keep it stored at 140°F or warmer or 40°F or colder. Reheat leftovers to at least 165°F before serving.
3. Hospitals and providers should immediately report suspected foodborne illness outbreaks to the Alaska SOE.

References

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