State of Alaska Epidemiology **Bulletin**

Department of Health and Social Services
William H. Hogan, MSW, Commissioner
Jay Butler, MD, Chief Medical Officer

3601 C Street, Suite 540
Anchorage, Alaska 99503 http://www.epi.Alaska.gov

Division of Public Health
Beverly Wooley, Director

Local (907) 269-8000
24 Hour Emergency (800) 478-0084

Editors:
Joe McLaughlin, MD, MPH
Bradford D. Gessner, MD, MPH

Bulletin No. 20 October 8, 2008

Campylobacteriosis Outbreak due to Consumption of Raw Peas — Alaska, 2008

Introduction

Campylobacter jejuni, a spiral-shaped bacteria, is one of the most common causes of diarrheal illness in the United States. Campylobacteriosis is characterized by diarrhea (frequently bloody), abdominal pain, malaise, fever, nausea and/or vomiting. Symptoms occur 2–10 days after infection and can persist for weeks. The vast majority of cases occur as isolated, sporadic events, rather than part of recognized outbreaks. On August 21, the Section of Epidemiology (SOE) was notified of a possible outbreak of campylobacteriosis in Southcentral Alaska. In collaboration with the Anchorage Department of Health and Human Services and the Alaska Department of Environmental Conservation (DEC), we began an immediate investigation.

Methods

Epidemiologic Investigation

A case-control study was performed to determine risk factors for illness. A case was defined as laboratory-confirmed *C. jejuni* infection diagnosed from August 1 thru September 26, 2008 in a person living in Southcentral Alaska. Two asymptomatic controls were selected for each case, matched on age-group (0–1, 2–17, 18–64, and ≥65 years) and location by progressive and sequential random-digit dialing anchored on the case-patient's telephone number. A questionnaire was administered by telephone or in person to case-patients and controls, and demographic information, illness characteristics, food and environmental exposures were recorded. Odds ratios were calculated for risk factors. Active surveillance was initiated to identify additional clinical cases, defined as a person with new onset of ≥3 episodes of watery diarrhea in a 24-hour period within 10 days of consuming raw peas grown in Alaska.

Environmental Investigation

Food suspected to have contributed to the outbreak was traced back to the primary producer. Disinfection and food processing practices were reviewed, and food, processing surfaces, and environmental samples were obtained.

Laboratory Investigation

Stool samples were collected from case-patients and forwarded to the Alaska State Public Health Laboratory (ASPHL); environmental samples were sent to Silliker Labs in Ohio and to the U.S. Centers for Disease Control and Prevention Campylobacter Reference Laboratory for analysis. Pulsed-field gel electrophoresis (PFGE) by SmaI and KpnI enzymes was performed on all available *C. jejuni* isolates.

Results

Epidemiologic Investigation

Sixty-three case-patients and 126 controls were enrolled in the case-control study. Seventy-six percent of case-patients (n=48) reported eating fresh peas versus 31% of controls (n=39). In multivariate analysis, only eating raw, shelled peas remained associated with illness (odds ratio: 24.8; 95% confidence interval: 10.9–56.4). To date, 54 persons with laboratory-confirmed and 45 with clinical campylobacteriosis reported eating peas within 10 days of illness onset (Figure). Ages ranged from 1–79 years (median: 47), and 76% were Anchorage or Eagle River residents. Five were hospitalized and one developed Guillain-Barré syndrome 9 days after symptom onset; none died.

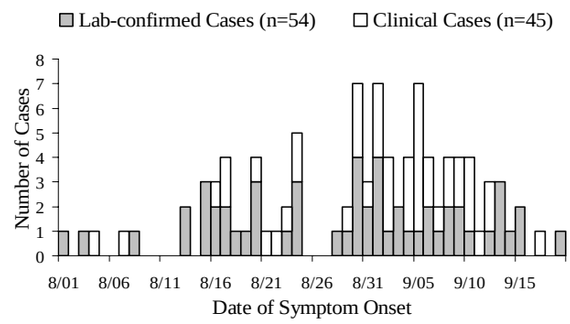
Environmental Investigation

Sanitarians traced peas consumed by several case-patients back to Farm A, the only pea farm and processor in Alaska. Several deficiencies were noted in the processing of peas at Farm A, including a lack of chlorine residual in pea-processing water. Sandhill Cranes were seen grazing in the pea fields in high numbers. From September 6–15, 42 environmental samples were collected from Farm A harvesting and processing equipment, water, produce, fertilizer, clothing, animal feces and product.

Laboratory Investigation

Campylobacter jejuni isolates from 42 ill persons were characterized by PFGE; 28 unique clinical PFGE patterns were identified. Sixteen environmental samples were positive for *C. jejuni*; 14 were from Sandhill Crane stool, one was from a mound of peas located near the pea processing building, and one was from freshly picked field peas. Fifteen unique environmental PFGE patterns were identified. Four of the clinical PFGE patterns (representing 15 ill persons) were indistinguishable from four of the environmental PFGE patterns (obtained from two of the Sandhill Crane stool samples and the two pea samples).

Figure. Campylobacter Cases Linked to Consumption of Peas — Alaska, 2008 (N=99)



Discussion

This investigation has established a firm linkage between *C. jejuni* infection and consumption of Farm A peas. Based on the molecular analysis of *C. jejuni* isolates from clinical and environmental samples, the source of contamination of the peas appears to be Sandhill Crane feces. Sanitarians identified a lack of chlorine residual in pea-processing water, suggesting that *C. jejuni* from crane feces picked up during harvesting likely contaminated shelled peas before packaging. Farm A voluntarily shut down operations on September 12 and local retailers removed remaining locally grown peas from their shelves. State officials are working with the farmer to implement future control measures.

Guillain-Barré syndrome is often preceded by *C. jejuni* infection and is associated with slow recovery and severe residual disability.[3]

Recommendations

1. Raw vegetables should be cooked or carefully washed prior to consumption.
2. Health care providers should consider testing for *Campylobacter* in any patient that presents with clinically compatible symptoms, and report cases to the Section of Epidemiology (call 907-269-8000).
3. Health care providers should advise patients with campylobacteriosis to drink extra fluids as long as diarrhea lasts. In more severe cases, providers should consider administering antibiotics such as erythromycin or a fluoroquinolone.

References

1. Campylobacter General Information. CDC. Available at: http://www.cdc.gov/nczved/dfbmd/disease_listing/campylobacter_gi.html
2. Heymann, DL, ed. 2004. Control of Communicable Diseases Manual, 18th ed. American Public Health Association.
3. Rees JH, et al. Campylobacter jejuni infection and Guillain-Barré Syndrome. *N Engl J Med* 1995; 333: 1374-9.

(Contributed by Tracie Gardner, PhD and Joe McLaughlin, MD, MPH, Alaska Section of Epidemiology.)