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Outbreak of *Campylobacter* - Connecticut, 1997

In August 1997, campylobacteriosis was diagnosed in four elderly individuals in a Connecticut town. Illness onset occurred on August 22 and 23. Two persons were hospitalized. Interviews revealed only one eating place common to all four persons, a senior center. A questionnaire was administered to patrons regarding meals and foods eaten at the center on August 18-20 and recent gastrointestinal illness. A case was defined as diarrhea in a senior center patron with fever or cramps and onset during August 20-25. Non-ill respondents were controls.

Overall 66 (52%) of the center's patrons during the period of interest responded. Sixteen cases were identified among these respondents. Case-patients (16/16) were more likely than controls (33/50) to have eaten at a Hawaiian luau held at the center on August 19 (odds ratio undefined, $p=.007$). Among those eating at the luau, the most strongly implicated food was sweet potatoes (15/15 case-patients, 19/32 controls, odds ratio undefined, $p=0.004$).

Interviews with food handlers and an environmental investigation revealed no ill food handlers and no single source of contamination. However, the luau was an unusually large meal for the center. On-site review of described preparation procedures identified multiple opportunities for cross contamination from raw meats (including raw chicken and chicken livers) to other foods (including sweet potatoes and the raw kale garnish used on them) because of inadequate separation of raw meat handling from other food preparation.

Editorial Note: *Campylobacter* is the most

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commonly reported cause of bacterial foodborne illness in Connecticut and in the United States (U. S.). *Campylobacter* infection results in acute gastrointestinal illness of varying severity with symptoms including diarrhea (sometimes bloody), abdominal pain, fever, nausea, and vomiting. The incubation period for campylobacteriosis is usually 2 to 5 days, with a range of 1 to 10 days. Acute illness usually lasts 2 to 5 days, but symptoms can persist for several weeks. Recently, campylobacteriosis has been found to be associated with the Guillain-Barre syndrome in a small number of cases (1). Infections can be severe in immunocompromised or elderly patients but are rarely fatal.

Most cases of *Campylobacter* infection are sporadic and contaminated poultry has been found to be a common cause of these infections (2). Outbreaks have most commonly been traced to contaminated raw milk, poultry, or water (3). A previous *Campylobacter* outbreak in Connecticut was associated with cake frosting (3). However, cross-contamination in the kitchen, likely from poultry, was suggested as a potential cause of at least two other foodborne outbreaks of campylobacteriosis (4,5). Both raw chicken and raw chicken livers have been found to be frequently contaminated with *Campylobacter* (6,7).

In this outbreak, because a large volume of food was prepared, the usual food handling practices of the kitchen staff were not followed. This resulted in raw meats and poultry being handled in an area usually used only for cooked

foods and vegetables, creating the potential for cross-contamination. This outbreak investigation emphasizes the importance of strict separation of meat handling from other food preparation and the importance of having a special food-handling plan when preparing unusually large meals.

***Campylobacter* and the Connecticut EIP**

Intestinal illness due to *Campylobacter* is one of the diseases targeted for intensive surveillance in the Connecticut Emerging Infections Program (EIP) Foodborne Diseases Active Surveillance Network (FoodNet) in 1998. Connecticut FoodNet is one of seven sites working collaboratively with the Centers for Disease Control and Prevention (CDC), the U.S. Department of Agriculture, and the Food and Drug Administration (FDA).

The objectives of FoodNet are to describe the epidemiology of emerging foodborne pathogens, estimate the frequency and severity of foodborne diseases that occur in the U.S. each year, and determine the proportion of specific foodborne diseases associated with certain contaminated foods. Data from this project will be used to assist in the evaluation of new food safety programs and regulations. The following summarizes *Campylobacter* surveillance efforts for 1997 and describes 1998 activities.

Active Laboratory Surveillance

During 1997, 532 culture-confirmed cases of *Campylobacter* infection were identified among the 2.4 million residents of Hartford, New Haven and Fairfield counties. Incidence rates varied by county with significantly higher rates of campylobacteriosis reported in Fairfield County residents (27 per 100,000 population) when compared to New Haven County residents (20 per 100,000 population) and Hartford County residents (18 per 100,000) population.

Infection rates were similar among males and females but varied by age group, race, and

ethnicity. Males accounted for 275 (52%) cases. Rates were highest in persons <10 years of age and in persons aged 30-39 years (Figure 1). Information on race and ethnicity was available for 186 (35%) cases. Whites accounted for 133 (72%) cases, Hispanics 37 (20%) cases, blacks 9 (5%) cases, and Asians 7 (4%) cases.

Information on hospitalization was obtained for 296 (56%) cases. Of these, 57 (19%) were hospitalized. No deaths occurred among hospitalized cases. The distribution of cases showed a marked seasonal variation (Figure 2) with 233 (44%) cases occurring from June through August.

Figure 1

Incidence Rate of *Campylobacter* Infection by Age Group Connecticut FoodNet, 1997

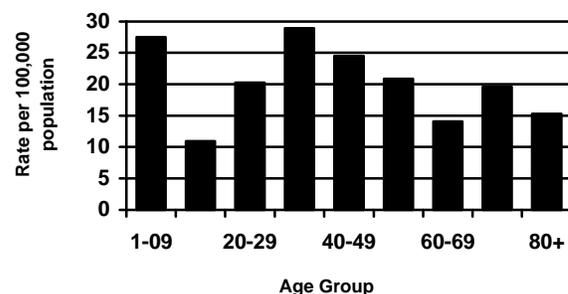
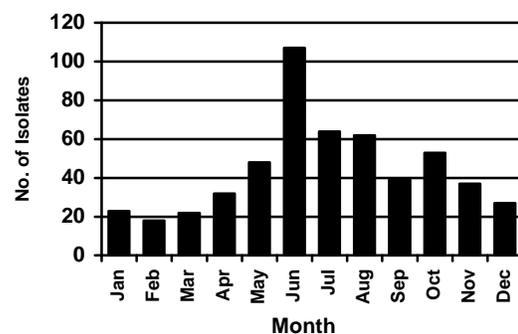


Figure 2

***Campylobacter* Infection by Month of Collection Connecticut FoodNet, 1997**



***Campylobacter* Case-Control Study**

In 1998, all persons with laboratory-confirmed *Campylobacter* infection from Fairfield, Hartford, and New Haven counties will be invited to participate in a case-control study to identify risk factors for campylobacteriosis. It is anticipated that 200 cases and 200 age-group matched controls will be enrolled from each of the seven FoodNet sites.

Cases and controls are being interviewed using a standardized questionnaire developed by the CDC and FoodNet sites. The interview obtains information regarding the person's health, recent foods eaten, other potential risk factors such as travel, drinking water, contact with animals, or raw milk, and food handling practices (specifically poultry handling). Data will be collected for a 12-month period, combined with the other six FoodNet sites, and analyzed in aggregate at the CDC.

***Campylobacter* Antimicrobial Resistance Studies**

In the past decade, fluoroquinolone-resistant *Campylobacter* species, particularly *C. jejuni* and *C. coli*, have begun to emerge among human isolates. Resistance has occurred primarily due to the use of antimicrobial agents in food animals, increased use among travelers, and the increased use of ciprofloxacin for treatment of human infections.

In 1995, the FDA approved the use of sarafloxacin for use in drinking water in poultry to control illness caused by *E. coli* (8). This is the first fluoroquinolone antimicrobial agent approved for use in animals in the U.S. In the Netherlands, the use of fluoroquinolones in poultry was followed by an increase in resistance of *Campylobacter* isolated from humans in that country (9).

Often persons traveling abroad take prophylactic broad-spectrum antibiotics, such as ciprofloxacin, to prevent "travelers' diarrhea", especially when traveling to countries with poor sanitation facilities. These are countries where fluoroquinolone use may be common in animals

and humans. Recent studies in the United Kingdom (10) and in the U.S. (11) found that foreign travel or quinolone use 1 - 30 days prior to infection were risk factors for ciprofloxacin-resistance.

To identify the extent of antimicrobial resistance in the U.S., the CDC initiated the National Antimicrobial Resistance Monitoring system (NARMS). In 1997, Connecticut FoodNet participated in this system with the State Laboratory by sending one *Campylobacter* isolate per week to the CDC from one large independent clinical microbiology laboratory in Connecticut. The specimens were tested at the CDC by E-test to determine minimum inhibitory concentrations (MICs) to seven antibiotics.

Of the first 150 isolates tested from five FoodNet sites, 13% were found to be ciprofloxacin-resistant (MIC>32 mg/L). This is a significant increase from the 0% (0/313 isolates) found to be resistant in the U.S. in 1989-90 (12). A retrospective case-control study has been initiated to determine the clinical outcome of resistant strains compared with susceptible strains and to assess risk factors for resistance among the isolates collected by NARMS in 1997.

***Campylobacter* Isolates to be Sent to the State Laboratory in 1998**

In 1998, DPH is asking clinical microbiology laboratories to send all *Campylobacter* isolates to the State Laboratory. The State Laboratory will confirm identification of the isolate and determine antimicrobial resistance using the E-test for azithromycin, chloramphenicol, ciprofloxacin, clindamycin, erythromycin, gentamycin, nalidixic acid, and tetracycline. Results from aggregate data analysis will be compiled and made available to all Connecticut laboratories upon completion of the study.

For more information about the Connecticut FoodNet, contact Ruthanne Marcus or Terry Fiorentino at Yale University School of Medicine, Department of Epidemiology and Public Health, (203) 785-2920 or (203) 785-2925.

REFERENCES

1. Allos BM. Association between *Campylobacter* infection and Guillain-Barre syndrome. *J Infect Dis* 1997;176 Suppl 2:S125-S128.
2. Blaser MF, Checko P, Bopp C, et al. *Campylobacter enteritis* associated with foodborne transmission. *Am J Epidemiol* 1982;116:886-894.
3. Tauxe RV, Hargrett-Bean N, Patton CM and Wachsmuth IK. *Campylobacter* isolates in the United States, 1982-1986. *MMWR* 1988;37(SS-2):1-13.
4. Brown P, Kidd D, Riordan T, Barrell RA. An outbreak of food-borne *Campylobacter jejuni* infection and the possible role of cross-contamination. *J Infect* 1988;17(2):171-176.
5. CDC. Outbreak of *Campylobacter enteritis* associated with cross-contamination of food - Oklahoma, 1996. *MMWR* 1998;47:129-131.
6. Harris NV, Thompson D, Martin DC and Nolan CM. A survey of *Campylobacter* and other bacterial contaminants of pre-market chicken and retail poultry and meats, King County, Washington. *Am J Public Health* 1986;76:401-406.
7. Fernandez H, Pison V. Isolation of thermotolerant species of *Campylobacter* from commercial chicken livers. *Int J Food Microbiol* 1996;29(1):75-80.
8. CDC. Establishment of a national surveillance program for antimicrobial resistance in *Salmonella*. *MMWR* 1996;45(5):110-111.
9. Endtz HP, Ruijs GJ, van Klingeren B, Janse WH, van der Reyden T, Mouton RP. Quinolone resistance isolated from man and poultry following the introduction of fluoroquinolones in veterinary medicine. *J Antimicrob Chemother* 1991;27:199-208.
10. Gaunt PN, Piddock LJV. Ciprofloxacin resistant *Campylobacter* spp. in humans: an epidemiological and laboratory study. *J Antimicrob Chemother* 1996;37:747-757.
11. Smith KE, Besser JM, Leano F, Bender JB, Wicklund JH, Johnson B, Hedberg CW, Vought K, MacDonald KL, Osterholm MT. Fluoroquinolone-resistant *Campylobacter* isolated from humans and poultry in Minnesota. In: International Conference of Emerging infectious Diseases, Atlanta, March 8-11, 1998.
12. Sobel J, Tauxe RV, Ries A, Patton C, Mahoney K. The burden of *Campylobacter jejuni* infection: a target for early treatment. In: 45th Annual Epidemic Intelligence Service Conference, Atlanta, April 22-26, 1996.

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