CD Summary

July 6, 2012
Vol. 61, No. 14

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OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

CAMPYLOBACTERIOSIS: COMMON AND BECOMING COMMONER

Campylobacter infection is the most common bacterial cause of gastroenteritis in the United States — about 2.4 million cases occur in the U.S. each year.* While most *Campylobacter* infections present as self-limited cases of diarrhea, approximately 124 people in the U.S. die of campylobacteriosis each year. Because we typically see increases in the summer, we devote this *CD Summary* to *Campylobacter* and prevention strategies.

MICROBIOLOGY 101

Campylobacter species are spiral-shaped, gram-negative rods that can be cultured on selective media after incubation at 42°C for 24–48 hours under microaerophilic conditions.[1] English veterinarians first isolated them in 1909 from aborted sheep fetuses, thinking they were a sub-species of *Vibrio fetus*.[2] Later biochemical features necessitated creation of the new genus *Campylobacter*. In recent years, 14 species were recognized and several split off into yet another new genus, *Arcobacter. Campylobacter jejuni* causes most cases of human illness; *C. coli* causes occasional illness, *C. lari* and *C. fetus*, less still. *C. jejuni* can be differentiated from other species by a positive hippurate hydrolysis test.

SYMPTOMS

Most *Campylobacter* infections in humans cause diarrhea (often bloody), abdominal cramps and fever, but they can occasionally result in bacteremia and septicemia. The incubation period ranges from 2–5 days. Infection is usually self-limited, but severe infections require antibiotic treatment. Occasional sequelae of *Campylobacter* infection include Guillain-Barré Syndrome (GBS) and reactive arthritis. Approximately one in 1,000 *Campylobacter* infections results in GBS,[3] an immune-mediated disorder of the peripheral nervous system. GBS causes acute flaccid paralysis 1–3 weeks following *Campybacter* infections, typically *Campylobacter* O:19.

FROM WHENCE?

Campylobacter lives in the intestinal tracts of a variety of animals, including dogs, cats, cattle, sheep, goats, chickens and turkeys. *Campylobacter jejuni* seems uniquely adapted to birds, which are often asymptomatic carriers and have body temperatures that facilitate growth of the bacteria.

Oregon participates in the Food and Drug Administration National Antimicrobial Resistance Monitoring System (FDA-NARMS) Retail Food program. FDA-NARMS tests poultry, beef, and pork from grocery stores for the presence of *Campylobacter*, *Salmonella*, and *E. coli* O157. In 2005, *Campylobacter* was present on 47% of raw chicken breasts tested by FDA-NARMS. *Campylobacter* was also present in the giblets, especially the liver.* More recent data from 2008 showed that about 80% of chicken breast samples were positive for *Campylobacter*.

Not surprisingly, most human cases of campylobacteriosis are associated with eating raw or undercooked poultry or cross-contamination by these items.

OREGON DATA

Campylobacteriosis is a reportable disease in Oregon. While reported rates of *Campylobacter* infections have been inching up between 2000 and 2009, the trend line steepened between 2009 and 2011 (Figure 1) the cause of which is not known. The highest incidence of infection is in children ages 0–4 years (Figure 2), and incidence is higher among men than women. Cases peak in summer (Figure 3), possibly due to eating undercooked chicken from the BBQ or putting cooked chicken back on unwashed plates.

Figure 1. Campylobacteriosis in Oregon, 2000–2011

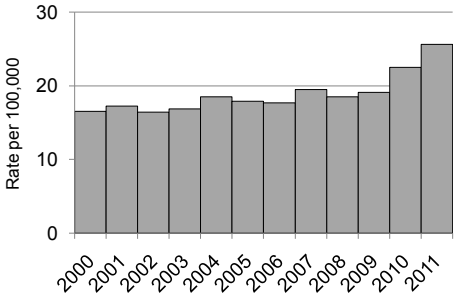


Figure 2. *Campylobacter* infection by age group, Oregon, 2011

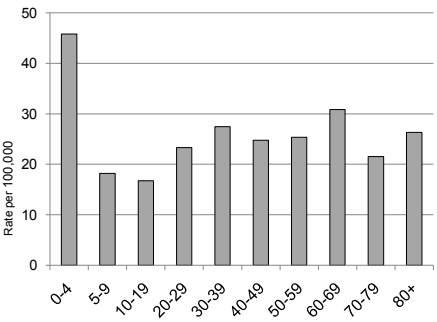
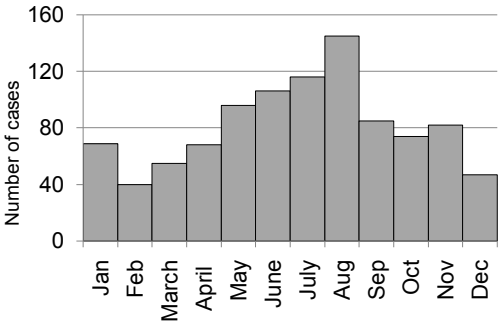


Figure 3. Campylobacteriosis by report month, Oregon, 2011



EPIDEMIOLOGICAL STUDIES

Campylobacter infections can cause outbreaks of gastroenteritis, but most cases occur sporadically. In 1998, Oregon participated in a multi-state case-control study to examine risk factors for sporadic infection. The study identified multiple risk factors, including consumption of chicken and non-poultry meat prepared at a restaurant, international travel, consumption of raw milk, contact with farm animals, and consumption of untreated water from a lake, river or stream.[4]

*www.cdc.gov/nczved/divisions/dfbmd/diseases/campylobacter/

The **CD Summary** (ISSN 0744-7035) is published fortnightly free of charge, by the Oregon Health Authority, Public Health Division, 800 NE Oregon St., Portland, OR 97232
Periodicals postage paid at Portland, Oregon.
Postmaster—send address changes to:
CD Summary, 800 NE Oregon St., Suite 730, Portland, OR 97232

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PERIODICALS POSTAGE **PAID** Portland, Oregon

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Another study identified risk factors for *Campylobacter* infections among infants including riding in a shopping cart next to raw meat or poultry, drinking well water, having a pet with diarrhea at home, eating fruits and vegetables prepared at home, and international travel.[5]

And in the category of "yet another reason to avoid raw milk," a recent report by the Centers Disease Control and Prevention found *Campylobacter* to be the causative agent for 54% of outbreaks associated with unpasteurized dairy products.[6]

Widespread use of antibiotics in poultry farming has led to unintended consequences, particularly concerning *Campylobacter* infections. In 1995, the FDA approved fluoroquinolones for use in poultry flocks to reduce respiratory infections due to crowding. Between 1997 and 2004, the percentage of human *Campylobacter* isolates tested through NARMS that were resistant to ciprofloxacin increased from 12% to 19%. In 2005, FDA withdrew approval for these agents for use in poultry.[7]

WHAT IS TO BE DONE?

Diagnosis and Treatment. If you have a patient who presents with bloody diarrhea, or if you suspect that they may have *Campylobacter* infection, you should order a stool culture. Laboratories routinely look for *Campylobacter*, *Salmonella*, and *Shigella* in stool cultures. Deciding when to treat diarrheal disease with antibiotics can be tricky. Most *Campylobacter* infections (and salmonellosis cases) do not need treatment and will recover without treatment, but severe cases should be treated. In contrast. *E. coli* 0157:H7 infections should NOT be treated with antibiotics since antibiotics may actually increase the risk of developing hemolytic uremic syndrome (HUS). For *Campylobacter* infections, antibiotics such as azithromycin or erythromycin can shorten the duration of symptoms.

Prevention. Since raw and undercooked poultry is the main source of infection for humans, it is important to thoroughly cook poultry, avoid cross-contamination of raw poultry with other foods, and keep those toddlers in the grocery cart from playing with raw meat packages. In addition, pets (particularly cats and puppies) may be a source of infection for kids, so make sure that pets are healthy, and that kids wash their hands after touching their pets BEFORE they put their fingers in their mouths or eat.

Prevent Campylobacteriosis

- Thoroughly cook all meat, especially poultry, which should be cooked to a minimum temperature of 165°
- Avoid unpasteurized milk and cheese
- Avoid cross-contamination of ready-to-eat food with raw poultry
- Wash cutting boards with soap after cutting poultry
- Use separate cutting boards for meat/poultry and fruits/vegetables
- Wash hands after handling raw poultry
- Wash hands after touching pet feces and farm animals, particularly before eating

INFORMATION

- Acute and Communicable Disease Prevention Program and *http://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/Pages/disease.aspx?did=81*

RESOURCES

- Center for Disease Control and Prevention: *www.cdc.gov/nczved/divisions/dfbmd/diseases/campylobacter/*

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