Calgary Laboratory Services

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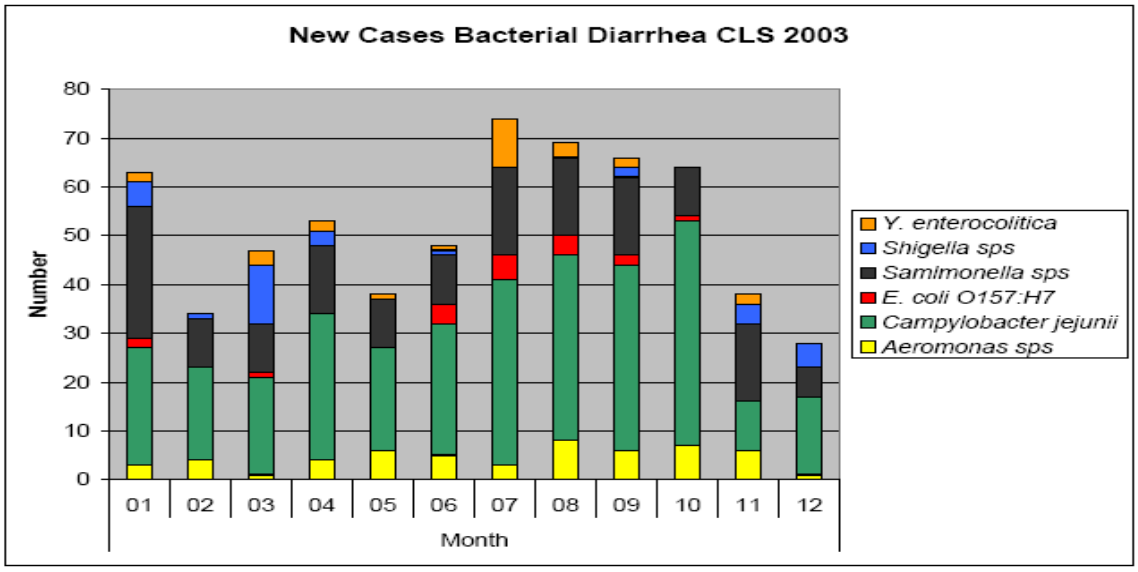
THERE ARE NO NORMAL VALUES IN MICROBIOLOGY!
AN IMPROPERLY COLLECTED SPECIMEN MEANS UNINTERPRETABLE RESULTS!

Campylobacter jejuni: A Common Bacterial Enteric Pathogen with Interesting Disease Associations

Campylobacter jejuni is one of the most common causes of bacterial enterocolitis and infections are typically sporadic and occur most frequently in the summer and early fall in temperate climates. Although the incidence of Campylobacter infections in developing countries is much higher than that of industrialized countries, thousands of cases are reported to the public health system each year in Canada and 2.4 million cases are reported in the United States.

1) Prevalence of *C. jejuni* in Calgary:

As shown in **Figure 1**, *Campylobacter jejuni* is the most common cause of enterocolitis detected in stool cultures submitted to the CLS laboratory.



2) How is *C. jejuni* infection acquired?

C. jejuni is commonly isolated from animals including various types of chickens and ducks as well as from cattle. Gastrointestinal infection is usually acquired through ingestion of improperly handled or cooked food, mainly poultry products. Outbreaks have also been described due to contamination of surface and well water by cattle waste. Travelers to developing countries are also at risk for acquiring Campylobacter infection due to ingestion of contaminated food and/or water.

3) Laboratory Identification:

This organism is commonly recovered from stool specimens grown on a selective medium containing charcoal (i.e., charcoal cefoperazone deoxycholate agar (CCDA) or a blood-containing medium such as Campy-CVA or Skirrow. *C. jejuni* grows best at 42^0C under microaerophilic conditions and colonies are oxidase-positive. Gram stain appearance shows typical gram-negative, curved or S-shaped rods. *C. jejuni* hydrolyzes sodium hippurate while other Campylobacter species do not. Although antibiotic susceptibility against naladixic acid and cephalothin have historically been used to further differentiate Campylobacter, increasing levels of resistance in *Campylobacter sp.* including *C. jejuni* make these phenotypic tests less reliable as identification methods.

4) Campylobacter Enterocolitis:

The highest incidence of gastrointestinal illness due to Campylobacter infection occurs in infants and young children with a secondary peak in young adults aged 20-40 years. Patients with Campylobacter enterocolitis may be critically ill or have only mild diarrhea. Symptoms in more severe cases include fever, diarrhea that may be bloody and associated with abdominal crampy pain and tenesmus. In healthy individuals, Campylobacter enterocolitis is usually self-limited and symptoms abate within 5-7 days without antibiotic treatment.

5) Other Infections Due to Campylobacter:

Campylobacter gastrointestinal infection may mimic appendicitis, particularly in children. Infection may also disseminate outside the gastrointestinal tract, particularly in infants, the elderly and in patients who are immunosuppressed. Extra-intestinal infections that have followed C. jejuni enterocolitis include bacteremia, sepsis, urinary tract infections, peritonitis, myocarditis and focal infections such as abscess formation, septic arthritis and meningitis. Patients who are HIV seropositive may have persistent Campylobacter enterocolitis and bacteremia.

6) Other Diseases Associated with Campylobacter Infections:

C. jejuni has been shown to be the most common cause of infection preceding the onset of Guillain-Barré syndrome, which manifests as an acute paralytic disease of the peripheral nervous system. The mechanism of this process most likely involves a host immune response to ganglioside-like surface structures that are expressed on *C. jejuni*. Immune reaction to these molecules mediates damage to the peripheral nerve which is highly ganglioside enriched. Other unusual host immune reactions have also been associated with *C. jejuni* infections including reactive arthritis with pain and joint swelling that occurs days or even weeks after the diarrhea subsides. Reiter's syndrome has also been associated with Campylobacter infection and patients who develop joint involvement are usually HLA-B-27 positive.

7) Trends in Antibiotic Resistance:

Most healthy individuals with confirmed Campylobacter enterocolitis do not need to be treated with an antibiotic. However, infants, the elderly and patients with immunosuppression may need to be treated. Resistance of *C. jejuni* to nalidixic acid has been rapidly increasing worldwide. Resistance to nalidixic acid alerts the laboratory that the isolate may have acquired stepwise resistance to fluoroquinolones (i.e., norfloxacin, ciprofloxacin) that are commonly used for treatment. Further antibiotic susceptibility testing is routinely done at CLS on these strains. CLS also routinely does antibiotic susceptibility testing on all Campylobacter isolates from extra-intestinal sites (i.e., blood, sterile fluids, etc.).

IF YOU HAVE ANY QUESTIONS OR COMMENTS ABOUT HOW THE LABORATORY WORKS, PLEASE CALL US AT 770-3396 (Brenda Kirkham, Manager, Microbiology) or 770-3281 (Dr. Church, Division Head, Microbiology)

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