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Campylobacter jejuni bacteremia in the setting of pancytopenia

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Introduction

Campylobacter species are a common infectious cause of acute diarrhea worldwide. Small gram-negative bacteria, *Campylobacter* species are commonly transmitted fecal-orally and frequently found nonpathogenically in the guts of animals including chickens, creating a risk for frequent animal-human transmission. *Campylobacter jejuni*, one of the most important *Campylobacter* species for human health, typically produces a watery or inflammatory diarrhea. It is common in developing countries and outbreaks are often linked to contaminated water, unpasteurized milk, undercooked poultry, and contact with animals or infected persons. *C. jejuni* is a fastidious, gram-negative spiral-shaped rod which is best detected by culture but can also be seen on microscopic examination of a stool sample of a symptomatic patient with enteritis. Microscopy typically also reveals red blood cells or neutrophils. Culture is usually performed using a selective agar with sheep blood, vancomycin, amphotericin B, cephalothin, polymyxin B, and trimethoprim, incubated at 42 degrees with 5-10% oxygen, 1-10% carbon dioxide, and some hydrogen¹.

C. jejuni typically presents in adults with diarrhea, commonly associated with abdominal pain and a high fever². The diarrhea is usually watery but frequently becomes bloody. Symptoms usually peak for 24-48 hours before gradually resolving, but some cases can last up to a week. While antibiotics are not typically necessary, as the course is short, they are commonly used in more severe or prolonged cases or in cases where the patient has immunosuppression or immunodeficiency. Infection can spread to contiguous organs, including the pancreas or gallbladder, and bacteremia can lead to seeding of distant organs, though bacteremia is rare and usually occurs only in immunocompromised patients. Complications of infection can include Guillain-Barre syndrome, reactive arthritis, and spontaneous abortion.

Case Description

Our patient is a 57-year-old woman with a past medical history of decompensated NASH cirrhosis and type II diabetes mellitus currently undergoing workup for a pancytopenia who presented to our emergency department with low-grade fever two days after bone marrow biopsy. She was found to have a two-day history of explosive watery yellow stool without any nausea, vomiting, or abdominal discomfort. Her temperature was 38.1 degrees Celsius with an increase in white blood cells to 4k from her baseline of 3k, with minor increases in creatinine and liver enzymes stable as per her baseline. On CT, she had mild duodenitis. Influenza and *Clostridium difficile* workup were negative. Stool and blood cultures were taken and she was started on IV vancomycin and cefepime for her neutropenic fever. Stool culture came back positive for *C. jejuni* and blood cultures later came back positive for the same, demonstrating curved gram-negative bacteria. Due to her neutropenia and her existing once-weekly ciprofloxacin dosing for spontaneous bacterial peritonitis prophylaxis, she was treated with azithromycin for a total of 7 days. During her inpatient stay, her bone marrow biopsy also came back and appeared normal. She was discharged to follow up on the pancytopenia with her usual doctors, continuing her SBP prophylaxis and counseled on common complications of *C. jejuni*.

Labs

Table 1. Admission labs were consistent with acute diarrheal illness, known NASH cirrhosis, and pancytopenia currently undergoing workup. Electrolytes improved during her hospitalization with improvement of the diarrhea and appropriate rehydration. Blood counts remained low.

	Admission labs 3/4/2020 7:21	Discharge labs 3/6/2020 21:00
Sodium	129(L)	132(L)
Potassium	3.3(L)	3.9
Chloride	95(L)	107
CO2	22	21
Anion Gap	12	4
Blood Urea Nitrogen	19	12
CREATININE	1.21(H)	1.06
Calcium	8.3	8.3(L)
ALT/SGPT	44(H)	
AST/SGOT	49(H)	
Albumin	2.9(L)	
Bilirubin, Total	2.6(H)	
Bilirubin, Direct	0.6(H)	
Alkaline Phosphatase	147(H)	
Lactate, whole blood	3.3(H)	
WBC Count	4	1.8(L)
RBC Count	3.62(L)	3.42(L)
HEMOGLOBIN	11.5(L)	10.9(L)
HEMATOCRIT	34(L)	31.3(L)
MCV	93.8	91.6
MCH	31.7	31.7
MCHC	33.8	34.7
PLATELET COUNT	22(LL)	27(LL)
Neutrophil,%	81	62
Lymphocyte,%	8	19
Monocyte,%	10	14
Eosinophil,%	1	5
Basophil,%	0	0
Neutrophil, Absolute	3.2	1.1(L)
Lymphocytes Absolute	0.3(L)	0.3(L)
Monocytes, Absolute	0.4	0.2
Eosinophils, Absolute	0	0.1
Basophils, Absolute	0	0

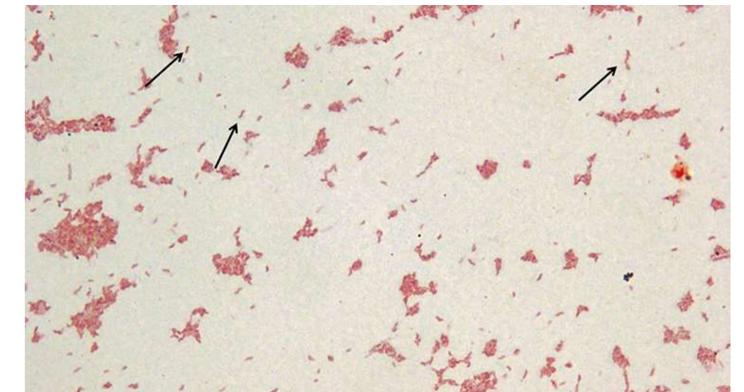


Figure 1. *Campylobacter jejuni*, demonstrating characteristic “comma” shape. Gram stain, shown at 1000x. From: *Campylobacter jejuni* infections linked to pet shop puppies, Bloch D and Pickering L. K., 2018.

Discussion

Bacteremia is an uncommon consequence of *C. jejuni* enteritis, though it is also likely underreported due to difficulty in culturing and lack of indication in many patients^{3,4}. Risk of bacteremia increases with immunocompromise, but patients who are not immunocompromised may also be affected. *C. jejuni* can evade host defenses with several virulence factors, including flagella, cytotoxin, and serum resistance³. Risk is also increased with old age and male gender, as well. While most cases may go unnoticed due to the short, self-limiting course of the diarrheal illness, an increased suspicion in patients with immunocompromise may be warranted.

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