

# Campylobacter Infection-Associated Acute Pancreatitis in a Renal Transplant Recipient

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## ABSTRACT

Immunocompromised individuals (patients with cancer, diabetes, HIV/AIDS, transplant recipients) and pregnant women are at greater risk of complicated foodborne illness than the general population. Though rare, *Campylobacter* enteritis-associated acute pancreatitis has not been reported in an immunocompromised host to our knowledge. Herein, we describe a case of *Campylobacter* infection-associated pancreatitis in a renal transplant recipient. This case highlights the need for food safety education for the immunocompromised, emphasizes the role of health care providers in encouraging adherence to food safety guidelines, and stresses the need to maintain broad infectious differentials for immunocompromised patient populations, even for conditions which are not commonly associated with an infectious etiology.

**KEYWORDS:** pancreatitis, *Campylobacter*, renal transplant, immunosuppression, food-borne illness, food safety

## CASE REPORT

A 63-year-old man with history of renal transplant presented to the emergency department with eight days of non-bloody diarrhea, emesis, and subjective fever. His past medical history was notable for two deceased donor kidney transplants 29 and 15 years prior for end-stage renal disease of unknown etiology, for which he took sirolimus, prednisone, and mycophenolate mofetil. He also had a history of post-transplant diabetes mellitus, gout, hypertension, and diverticulitis, for which he had undergone hemicolectomy seven years before. He did not drink alcohol, smoke, or use any recreational substances.

Ten days prior to presentation, the patient attended a funeral where he ate papaya salad with raw shrimp. Two days later, he began experiencing copious watery diarrhea. The diarrhea occurred approximately eight times per day and was usually yellow but sometimes black. He also reported emesis that occurred twice per day without blood or coffee-ground appearance. The following day, he began to feel feverish. Other people who had attended the same funeral also reported gastrointestinal symptoms.

In the emergency department, the patient's vital signs

**Table 1.** Pertinent Laboratory Values

Laboratory Test	Patient Value	Normal Range
Creatinine (mg/dL)	3.46	0.64–1.27*
Lipase (IU/L)	791	10–60
Triglycerides (mg/dL)	392	40–149
Calcium (mg/dL)	8.4	8.5–10.5

\*Patient baseline creatinine: 1.8–2.2

were notable for blood pressure of 96/65 mmHg, heart rate of 101 beats per minute and temperature of 36°C. Physical exam revealed epigastric tenderness. Pertinent labs, including elevated amylase and lipase, are shown in **Table 1**. Given that the triglycerides were only moderately elevated, we eliminated pancreatitis caused by hypertriglyceridemia due to sirolimus. Multiplex stool polymerase chain reaction (PCR) was positive for *Campylobacter*, *Vibrio*, and enteropathogenic *E. Coli* (EPEC). *Clostridium difficile* PCR was negative. An abdominal and pelvic CT with contrast revealed an unremarkable gallbladder with no biliary dilatation. The pancreas appeared normal without peripancreatic inflammatory changes. Abdominal ultrasound revealed no gallbladder stones and a normal-caliber (4 mm) common bile duct without evidence of cholelithiasis or choledocholithiasis. The patient was started on intravenous fluids and subsequently admitted to the renal transplant service.

Via diagnosis of exclusion given the patient's negative alcohol history, no cholelithiasis, triglyceride level less than 1,000 IU/L, and case reports linking *Campylobacter* spp. (but none of the other pathogens) to acute pancreatitis, *Campylobacter* enteritis was deemed to be the cause of pancreatitis.<sup>1–9</sup> As such, azithromycin 500mg daily was started, providing coverage for *Campylobacter*, EPEC and *Vibrio*. Mycophenolate mofetil was held given the active infection and the risk of exacerbating the diarrhea.

The patient's diarrhea improved rapidly and resolved on day 3 of hospitalization. Blood and conventional stool cultures showed no growth, serum creatinine returned to baseline, and the patient was discharged home on hospital day 4 to complete a 5-day course of azithromycin. His mycophenolate mofetil was restarted five days after discharge without sequelae and he was doing well six months after. The patient was counseled to avoid raw meat or seafood and communal food in the future.

## DISCUSSION

*Campylobacter* enteritis is rarely associated with acute pancreatitis. To our knowledge, only 19 cases have been reported to date.<sup>2-9</sup> Postulated mechanisms include bacterial invasion through the pancreatic duct, blood, or lymphatic system or obstruction of the ampulla of Vater by local inflammation. Similar mechanisms have been hypothesized for another invasive enteric pathogen, salmonella.<sup>10</sup> Alternatively, pancreatitis may also be a reactive immune phenomenon, similar to reactive arthritis associated with *Campylobacter*.<sup>5</sup>

In resource-rich countries, *Campylobacter* is typically transmitted through consumption of or cross-contamination with raw or undercooked meat, most commonly poultry and dairy products. In approximately one-quarter of cases, the source cannot be identified.<sup>11</sup>

Immunosuppressive medications place patients at increased risk for severe foodborne infections. One prospective study of 4405 solid organ transplant recipients in Switzerland found that 3% of *Campylobacter* foodborne illnesses in transplant recipients resulted in hospitalization, compared to 1% in the general population. Of note, 2.2% of the *Campylobacter* infections in this study resulted in graft failure, acute rejection, or death.<sup>12</sup> To avoid such complications, the 2019 American Society of Transplantation Infectious Disease Community of Practice guidelines recommend transplant patients avoid eating raw or undercooked meat, poultry, fish, and seafood, raw or undercooked eggs, and unpasteurized dairy products and fruit juice. It is also recommended that transplant recipients avoid consuming communal food and food at risk of improper handling and storing, including public salad bars, buffets, picnics and potluck meals.<sup>13</sup> Guideline adherence has not been thoroughly studied to date, but one single-center survey of 197 Swiss organ transplant recipients found that adherence to food safety recommendations decreased after the first year post-transplantation. Of the microbiologically confirmed foodborne infections in that cohort, none occurred in the 17.7% of patients who reported adherence to all food safety guidelines.<sup>14</sup> As such, immunocompromised patients may benefit from regular counseling about the importance of food safety guidelines. Providers can utilize existing patient education materials on food safety for the immunocompromised produced by the United States Department of Agriculture and the Food and Drug Administration.<sup>15,16</sup>

*Campylobacter*-associated pancreatitis also presents additional management challenges in immunocompromised patients. In prior case reports, *Campylobacter*-associated pancreatitis in immunocompetent patients was successfully managed with supportive care although details are too sparse to precisely ascertain outcomes. As this was the first reported case involving an immunocompromised patient, we decided to act more cautiously by initiating antibiotics as well as temporarily holding mycophenolate. These measures may have accelerated the resolution of symptoms.

There are significant diagnostic challenges associated with *Campylobacter* acute pancreatitis. In this case, we arrived at *Campylobacter* as a culprit of exclusion based on PCR results, prior case studies and no alternative explanation. Conventional stool cultures were negative, but this did not refute our diagnosis as PCR is known to be a better diagnostic tool than culture for *Campylobacter*, a fastidious organism.<sup>17</sup> It is, therefore, possible that the incidence of *Campylobacter* infection-associated complications is underestimated.

## CONCLUSION

*Campylobacter* enteritis-associated acute pancreatitis is rare. Transplant recipients are at a higher risk than the general population for contracting foodborne illnesses such as *Campylobacter* enteritis and they are also at higher risk for developing invasive *Campylobacter* infection due to immunosuppressive medications. While *Campylobacter* enteritis-associated acute pancreatitis can be managed with supportive care in a non-immunocompromised host, antibiotics may be preferred in renal transplant recipients to shorten symptom duration and potentially protect the graft. Food safety guidelines, including those by the United States Department of Agriculture and the American Society of Transplantation Infectious Disease Community of Practice provide immunocompromised patients recommendations on best food consumption practices. Immunocompromised patients should be educated on and regularly reminded of the importance of following food safety guidelines.

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## Disclaimer

The views expressed herein are those of the authors and do not necessarily reflect the views of Rhode Island Hospital or Brown University.

## Disclosures

None

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