There’s not always one enemy: Co-infection of campylobacter jejuni and non-typhoidal salmonella in a patient with systemic lupus erythematosus

Daisuke Asatori | Kota Shimada

Department of Rheumatic Diseases, Tokyo Metropolitan Tama Medical Center, Tokyo, Japan

Correspondence
Daisuke Asatori, Department of Rheumatic Diseases, Tokyo Metropolitan Tama Medical Center, 2-8-29 Musashidai, Fuchushi, Tokyo, 183-8524, Japan.
Email: fm98qe@gmail.com

Abstract
A 22-year-old, female patient with systemic lupus erythematosus experienced bacterial enteritis. A stool Gram stain revealed Campylobacter. Non-typhoidal Salmonella was detected in a stool culture, and Campylobacter jejuni was detected in a blood culture. Based on these findings, co-infection of Campylobacter jejuni and non-typhoidal Salmonella was diagnosed.

KEYWORDS
Campylobacter, co-infection, immunocompromised patient, salmonella, systemic lupus erythematosus

1 | INTRODUCTION

In community-onset, infectious enteritis, the incubation period and exposure history may serve as clues to identifying the causative organism, but a stool Gram stain and stool culture are necessary for certain identification. Furthermore, judicious use of antimicrobial agents should be considered as immunocompromised individuals, elderly patients, and patients with an internal prosthetic device have an increased risk of serious illness and complications.1 When bacterial enteritis is suspected, involvement of Campylobacter or non-typhoidal Salmonella is often suspected, and the initial empirical treatment usually targets one or the other. We herein reported a case of bacterial enteritis caused by a co-infection of Campylobacter jejuni and non-typhoidal Salmonella.

2 | CASE PRESENTATION

A 22-year-old female patient with systemic lupus erythematosus (SLE) receiving prednisolone 4 mg, tacrolimus 2 mg, hydroxychloroquine 300 mg, and belimumab 200 mg weekly presented to the emergency department with headache and chills of 2 days’ duration and vomiting, non-bloody, watery stools, abdominal pain, and fever of 1 day’s duration. History taking revealed that she had eaten grilled chicken 5 days earlier. The time of symptom onset and the history of food intake led to the suspicion of Campylobacter or non-typhoidal Salmonella infection. A stool Gram stain and stool culture were performed; the former revealed Gram-negative spiral rods, leading to the diagnosis of Campylobacter jejuni and non-typhoidal Salmonella. Based on these findings, co-infection of Campylobacter jejuni and non-typhoidal Salmonella was diagnosed.

Received: 5 August 2022 | Revised: 5 October 2022 | Accepted: 9 October 2022
DOI: 10.1002/ccr3.6515
The second blood culture remained negative after 7 days, and there was no symptom flare after the azithromycin therapy.

3 | DISCUSSION

In the present case, both Campylobacter and non-typhoidal Salmonella were considered the causative microorganisms on the basis of the incubation period and exposure history. The incubation periods of Campylobacter (2–5 days) and non-typhoidal Salmonella (1–3 days) overlap. Chicken meat, which was eaten by the patient prior to symptom onset, also sometimes harbors both Campylobacter and non-typhoidal Salmonella causing infectious enteritis.

Bacterial enteritis caused by a co-infection of Campylobacter and non-typhoidal Salmonella was diagnosed in the present patient. Since the specificity of a stool Gram stain for Campylobacter is about 99%, the Gram-negative spiral rods indicated a very high probability of Campylobacter enteritis. At the same time, non-typhoidal Salmonella was detected in a stool culture, and the clinical symptoms were consistent with non-typhoidal Salmonella enteritis. In the present case, Campylobacter was detected in the blood culture and stool Gram stain but not in the stool culture, in line with a finding that in rare cases, a Gram stain can be positive for Campylobacter even when a culture is negative, suggesting that a stool Gram stain may be useful for diagnosing Campylobacter enteritis microbiologically.

The present patient was susceptible to Campylobacter jejuni bacteremia because she had immunocompromised status, a known risk factor of Campylobacter jejuni bacteremia, and was receiving glucocorticoids and immunosuppressants. The number of immunocompromised patients has been on the rise in recent years for a variety of reasons, such as more intensive immunosuppressive therapy and an aging demographic. We may therefore expect the incidence of Campylobacter jejuni bacteremia to increase as well.

Campylobacter jejuni bacteremia should not be treated as transient in immunocompromised patients. In general, Campylobacter jejuni bacteremia is associated with a mortality rate of 0%–17%, and its prognosis is relatively good, with some patients improving spontaneously even without antimicrobial therapy. However, the mortality rate is higher in immunocompromised patients who do not receive antimicrobial therapy. Although some experts consider Campylobacter jejuni bacteremia to be a category of transient bacteremia that does not require treatment, the present patient was immunocompromised, justifying the use of antimicrobial therapy.

Choosing the optimal antimicrobial therapy for treating Campylobacter jejuni bacteremia can be difficult owing to the lack of high-quality evidence based on studies comparing the efficacy of various treatments. A variety of antimicrobial treatments are used, including ampicillin, ceftriaxone, ciprofloxacin, levofloxacin, meropenem, erythromycin, azithromycin, and fosfomycin, and a standardized treatment period has not been established because some cases of transient bacteremia resolve without treatment. Reports of past treatments have shown a considerable variation in the duration of treatment (4–19 days) and choice of antimicrobial agents. Many, previous patients were not treated with macrolides. Among those that were, one received erythromycin for 12 days.

Non-typhoidal Salmonella is usually expected to resolve spontaneously without antimicrobial therapy. However, antimicrobial therapy against non-typhoidal Salmonella is recommended for immunocompromised patients. On the contrary, antimicrobial therapy is also thought to increase the rate of bacterial carriage. Ceftriaxone and fluoroquinolones are recommended for the treatment of non-typhoidal Salmonella, but our patient improved without either of these antimicrobials. The 14 additional days of azithromycin therapy in the present case led to a favorable clinical course.

4 | CONCLUSION

The causative microorganisms in enteritis are clinically difficult to identify, and a co-infection of Campylobacter jejuni and non-typhoidal Salmonella may occur, as the present case has shown. Therefore, whenever bacterial enteritis is suspected in an immunocompromised patient, it is important to perform blood and stool cultures and, whenever possible, a stool Gram stain as well.

AUTHOR CONTRIBUTIONS
Daisuke Asatori was involved in the literature search wrote the clinical report. Kota Shimada revised the manuscript.

ACKNOWLEDGMENT
I would like to thank James Robert Valera for his guidance in English editing.

CONFLICT OF INTEREST
The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT
No Supplement.

ETHICAL APPROVAL
None.
CONSENT
Written informed consent was obtained from the patient to publish this report in accordance with the journal’s patient consent policy.

ORCID
Daisuke Asatori https://orcid.org/0000-0001-6523-0788

REFERENCES
1. Shane AL, Mody RK, Crump JA, et al. Infectious Diseases Society of America clinical practice guidelines for the diagnosis and management of infectious diarrhea. Clin Infect Dis. 2017;2017(65):e45-e80.
2. Wang H, Murdoch DR. Detection of campylobacter species in faecal samples by direct gram stain microscopy. Pathology. 2004;36(4):343-344.
3. Hussein K, Raz-Pasteur A, Shachor-Meyouhas Y, et al. Campylobacter bacteraemia: 16 years of experience in a single Centre. Infect Dis (Lond). 2016;48(11–12):796-799.
4. Mori T, Hasegawa N, Sugita K, et al. Clinical features of bacteraemia due to campylobacter jejuni. Intern Med. 2014;53(17):1941-1944.
5. Nielsen H, Hansen KK, Gradel KO, et al. Bacteraemia as a result of campylobacter species: a population-based study of epidemiology and clinical risk factors. Clin Microbiol Infect. 2010;16(1):57-61.
6. Pacanowski J, Lalande V, Lacombe K, et al. Campylobacter bacteraemia: clinical features and factors associated with fatal outcome. Clin Infect Dis. 2008;47(6):790-796.
7. Tasaka K, Matsubara K, Nigami H, Iwata A, Isome K, Yamamoto G. Invasive campylobacter jejuni/coli infections: 9 case reports at a single center between 2000 and 2015, and a review of literature describing Japanese patients. Kansenshogaku Zasshi. 2016;90(3):297-304. (Japanese, abstract in English).
8. Ladrón de Guevara C, Gonzalez J, Peña P. Bacteraemia caused by campylobacter spp. J Clin Pathol. 1994;47(2):174-175.
9. Onwuezobe IA, Oshun PO, Odigwe CC. Antimicrobials for treating symptomatic non-typhoidal salmonella infection. Cochrane Database Syst Rev. 2012;11(11):CD001167.
10. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 9th ed. Elsevier; 2019.

How to cite this article: Asatori D, Shimada K. There’s not always one enemy: Co-infection of campylobacter jejuni and non-typhoidal salmonella in a patient with systemic lupus erythematosus. Clin Case Rep. 2022;10:e06515. doi: 10.1002/ccr3.6515