

Campylobacter jejuni: A Previously Unreported Cause of Toxic Shock Syndrome

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Background

- *Campylobacter jejuni* is a common cause of dysentery in the United States. The diarrheal illness is usually **self-limited**. Cases are less common in adults; although, several risk factors have been described:
 - Contact with infected animals
 - Consumption of undercooked meat/poultry
 - Consumption of unpasteurized dairy products
- Only one case of Toxic Shock Syndrome caused by *C. intestinalis* has been reported in the medical literature.¹ There are **no reported cases of *C. jejuni* causing Toxic Shock Syndrome**.

Initial Presentation

- A previously healthy 44-year-old African American woman presented to our emergency department with a chief complaint of **dyspnea** for three days. Symptoms were preceded by five days of bloody diarrhea.
- Vital Signs revealed a **temperature of 100.4°F (38°C)**, a heart rate of **136 beats per minute**, and **22 respirations per minute**. CT of the chest revealed right lower lobe pneumonia. CT of the abdomen and pelvis was normal except for mild splenomegaly. Routine labs showed **no leukocytosis**. Urinalysis had **pyuria with negative nitrite, leukocyte esterase and rare bacteria**.

Day 4

- The patient complained of worsening lower extremity weakness and **myalgia**. She developed a fever to **104.9°F (40.5°C)**, **hemoglobin of 6.8 g/dL**, **leukocytosis to 20,100 cells/mm³**, **hyperbilirubinemia**, and mildly **elevated AST and ALT**. Right upper quadrant ultrasound was normal. On physical examination there was a diffuse, macular, orange rash and bilateral crackles.
- Later in the day, the patient was noted to have orange **rash involving the palms**. The patient had increased oxygen requirements on nasal cannula.
- The patient was now requiring nonrebreather mask and was **encephalopathic**. She was **hypotensive**. Oral thrush and a **strawberry tongue** were noted. The patient was intubated and placed on mechanical ventilation, transferred to the intensive care unit and started on fluconazole.

Progression of Illness

- Upon admission to the ICU, antimicrobial coverage was broadened to include vancomycin and cefepime. Blood and sputum cultures showed no growth. Lab work showed **elevated troponins**, which were attributed to type 2 NSTEMI secondary to atrial fibrillation with rapid ventricular response. Echocardiogram was read as possible myocarditis.
- The patient's white blood cell count climbed to over 40,000 cells/mm³, and she was **thrombocytopenic**. On day 6, physical examination was significant for a **positive Nikolsky sign** in the gluteal cleft. A rectal tube was placed for hygiene. Stool cultures were obtained.
- Stool studies returned positive for *Campylobacter jejuni*. The patient was started on clindamycin and restarted on azithromycin. Lumbar puncture was ordered.
- Vancomycin, azithromycin, and cefepime were discontinued, and meropenem was started to cover for resistant *Campylobacter* strains and empirically treat for *Campylobacter meningitis*.

Table A: Notable Laboratory Findings

Test	Reference Range	Day 1	Day 4	Day 7	Day 10
Hemoglobin	12.0 - 18.0 g/dl	8.6 g/dL	6.8 g/dL	8.9 g/dL	9.3 g/dL
White Blood Cell Count	4 – 10.5 x 10 ³ cells/μL	10.6 x 10 ³ cells/μL	20.1 x 10 ³ cells/μL	52.6 x 10 ³ cells/μL	28.5 x 10 ³ cells/μL
Platelets	150-450 x 10 ³ PLT/μL	196 x 10 ³ PLT/μL	74 x 10 ³ PLT/μL	81 x 10 ³ PLT/μL	73 x 10 ³ PLT/μL
Total Bilirubin	0.20-1.00 mg/dL	0.95 mg/dL	2.26 mg/dL	4.07 mg/dL	8.62 mg/dL
Direct Bilirubin	0.0-0.20 mg/dL	0.44 mg/dL	N/A	2.95 mg/dL	6.56 mg/dL
AST	15-37 Units/L	168 U/L	68 U/L	85 U/L	41 U/L
ALT	12-78 Units/L	128 U/L	51 U/L	42 U/L	50 U/L

CDC Criteria for Toxic Shock Syndrome²

- **Fever** greater than 102.9°F or 38.9°C
- **Rash**: Diffuse, macular erythroderma
- **Desquamation** (within 1-2 weeks of rash)
- **Hypotension** (Systolic BP < 90 mmHg)
- **Multisystem Involvement** (**three** or more required)
 - **CNS**: Encephalopathy in the absence of fever and hypotension
 - **GI**: Diarrhea or vomiting at illness onset.
 - **Hematologic**: Platelets less than 100,000/mm³
 - **Hepatic**: Bilirubin, AST, or ALT > 2x the upper limit of normal (ULN)
 - **MSK**: Severe myalgia or elevated CPK (> 2x ULN)
 - **Mucosal**: Vaginal, oropharyngeal, or conjunctival hyperemia
 - **Renal**: BUN and Cr (> 2x ULN)

Discussion

- All **five** criteria for the diagnosis of Toxic Shock Syndrome are present in this case.
- Stool cultures were positive for *Campylobacter jejuni*; no other sources were identified.
- Echocardiogram showed potential myocarditis; however, Cardiac MRI and endomyocardial biopsy were not available.
- CSF culture was negative, but the CSF was not cultured in a medium appropriate for *Campylobacter*.
- The patient was treated for *Campylobacter meningitis* with meropenem. She recovered after a long hospital course and was discharged to a subacute rehabilitation facility. She subsequently made a full recovery and is back at work.

Conclusion

- Toxic Shock has now been identified in association with a second bacterium of the *Campylobacter* genus.
- Further research is needed to identify risk factors for life-threatening sequelae – such as Toxic Shock Syndrome.

References

1. van der Zwan JC. Toxic shock syndrome by *Campylobacter intestinalis*. Lancet. 1984;1(8374):449. doi:10.1016/s0140-6736(84)91774-4
2. Toxic shock syndrome (other than streptococcal) (TSS) 2011 case definition. Centers for Disease Control and Prevention. <https://ndc.services.cdc.gov/case-definitions/toxic-shock-syndrome-2011/>. Published April 16, 2021. Accessed January 11, 2022.