Serendipitous Detection of Persistent Campylobacter jejuni Subspecies jejuni Bacteremia in a Patient Undergoing Bone Marrow Transplantation

Bacteremia with Campylobacter jejuni subspecies jejuni (referred to as C. jejuni) is uncommon and complicates <1% of infections due to this organism [1]. Humoral immunity is believed to be important in protection against C. jejuni infection, and reports of sustained bacteremia have been described in patients with hypogammaglobulinemia and HIV infection [2, 3]. We report, to our knowledge, the first case of sustained bacteremia with C. jejuni in an immunocompromised but completely asymptomatic patient.

A 53-year-old female with non-Hodgkin’s lymphoma had bone marrow harvested before undergoing autologous bone marrow transplantation. She was asymptomatic. Findings on physical examination and results of laboratory studies were unremarkable. Serology for antibodies to HIV was negative.

A portion of the harvested bone marrow was purged of tumor cells by use of 4-hydroperoxycyclophosphamide (4HC). A sample of the unpurged bone marrow was placed into a two-bottle BACTEC culture set (Becton Dickinson, Sparks, MD). Three days later, a curved gram-negative rod was detected in the aerobic bottle and was identified as C. jejuni. The patient was afebrile and still asymptomatic. There was no history of fever or gastrointestinal tract symptoms. She denied recent travel or ingestion of undercooked seafood or meat. Blood cultures performed 5 days after the bone marrow harvest yielded C. jejuni in all four bottles of the two culture sets. The results of cardiac examination were unremarkable, and echocardiography was not performed.

Susceptibility testing by agar dilution demonstrated MICs of ≤0.5 µg/mL for ciprofloxacin and 0.5 µg/mL for erythromycin. On the day that the blood culture became positive, treatment was started with erythromycin (500 mg po q.i.d.). Ciprofloxacin (500 mg b.i.d.) was substituted 2 days later because of gastrointestinal intolerance. The patient completed a 3-week course of ciprofloxacin and then underwent a second bone marrow harvest. Cultures of the bone marrow were sterile. Two weeks later, she received an infusion of 4HC-purged autologous bone marrow. Her subsequent clinical course was unremarkable. C. jejuni was reisolated from thawed samples of the untreated bone marrow, which had been frozen under liquid nitrogen, but not from the 4HC-treated bone marrow.

Molecular typing studies performed with use of flagellin gene typing by restriction fragment length polymorphism analysis of the Campylobacter flagellin gene flaA [4] revealed that all four isolates of C. jejuni (2 from blood, 1 from bone marrow, and 1 from frozen bone marrow) were of the identical flaA type, flaA-16.

Finally, we tested the susceptibility of the Campylobacter isolates to the complement-mediated bactericidal activity of normal human serum [5]. Both the blood isolate and bone marrow isolate demonstrated intermediate resistance to serum killing (table 1).

<table>
<thead>
<tr>
<th>Strain</th>
<th>Mean log10 killing at 60 min*</th>
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<tbody>
<tr>
<td>Controls</td>
<td></td>
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<tr>
<td>Campylobacter fetus 23D</td>
<td>0.02</td>
</tr>
<tr>
<td>C. fetus 23B</td>
<td>&gt;2.6</td>
</tr>
<tr>
<td>Patient’s isolate</td>
<td></td>
</tr>
<tr>
<td>IN355 (blood)</td>
<td>0.36</td>
</tr>
<tr>
<td>IN357 (bone marrow)</td>
<td>0.75</td>
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</tbody>
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* Susceptibility is defined as >1.0 log10, resistance as <0.1 log10, and intermediate resistance as 0.1–1.0 log10 killing [5].

Most strains of Campylobacter isolated from patients with gastrointestinal infections are susceptible to the bactericidal action of normal human serum; isolates from patients with systemic infections are more often resistant to serum [5]. The ability of the host to limit campylobacter infection may be due in part to the susceptibility of C. jejuni to serum killing. The intermediate resistance to normal serum killing seen in our patient may have been sufficient for the organism to cause sustained bacteremia.

Finally, we detected C. jejuni in the harvested bone marrow as an incidental finding. We were unable to recover C. jejuni from the purged material; however, the organism remained viable in frozen samples of the original material. Whether 4HC has antibacterial properties is unknown.

The findings in this case add to the scope of disease due to C. jejuni by demonstrating that persistent bacteremia with C. jejuni may occur in the absence of signs or symptoms of infection. It is not clear whether the sustained asymptomatic bacteremia in this patient was a result of the organism’s resistance to serum, to an immunologic deficiency in the patient or a combination of these factors.

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References