A 10-Year-Old Girl with a Rash and Abdominal Pain
(See pages 615–6 for the Photo Quiz)

Figure 1. Round, maculopapular lesions on abdomen

Diagnosis: rose spots associated with typhoid fever.

The combination of rose spots (figure 1), clinical symptoms, travel history, and mild elevation of the patient’s aspartate aminotransferase and alanine transaminase levels all supported the diagnosis of typhoid fever. Patients usually present with progressive fever, abdominal pain, vomiting, and diarrhea and sometimes present with respiratory symptoms. Typhoid fever is usually caused by infection due to Salmonella enterica serotype Typhi or, less commonly, by infection due to S. enterica serotype Paratyphi. The duration of incubation is usually 10–14 days, and humans are the only natural host [1]. Typhoid fever is endemic to many parts of Asia and is usually transmitted by ingestion of contaminated food or water. Rose spots (figure 1) are a rare finding; they are present after the first week of symptoms in only 5%–30% of cases and typically last only 2–3 days [1]. Although the exact etiology is unclear, histopathological examination of these lesions has shown widely dilated capillaries [2]. Rose spots may be caused by bacterial embolization, and cultures of samples obtained from the rose spots may be positive for Salmonella species [3].

Globally, typhoid fever is estimated to cause 21 million illnesses and 200,000 deaths each year [4–7]. S. Typhi may be isolated from cultures of blood, bone marrow, urine, stool, or rose spots. A positive blood culture result is considered to be
the standard for diagnosis; however, the organism is isolated in only 40%–60% of cases [5]. Tests to detect S. Typhi in the stool are less sensitive and are most useful for verification of chronic carrier status. It is estimated that 1%–5% of people continue to excrete S. Typhi in the urine or stool for >1 year after the initial infection [3].

Historically, typhoid fever was treated with chloramphenicol; however, in the past 20 years, there has been an increased prevalence of strains with resistance to chloramphenicol, amoxicillin, or trimethoprim-sulfamethoxazole [4, 5]. Standard treatment includes fluoroquinolones, which are associated with a cure rate of >98% but are seldom appropriate for use in children. If the organism is resistant to nalidixic acid, the rate of response to fluoroquinolones decreases to 75%, with a corresponding increase in the rates of relapse and chronic carrier status [3]. Alternative therapies include third-generation cephalosporins and azithromycin, which are associated with cure rates of >90% [1, 3]. Relapse occurs in 5%–10% of patients 2–3 weeks after onset of the initial symptoms despite adequate treatment. Treatment for relapse includes a more prolonged antimicrobial course.

Complications occur in 10%–15% of patients. The most common complications include gastrointestinal bleeding (in 10%–20% of patients), intestinal perforation (1%–3%), and typhoid encephalopathy (2%–40%) [3]. Mortality is estimated at <1%; however, parts of Indonesia have a mortality rate as high as 30%–50% among those with the most-severe disease [4]. Within 18 h after hospital admission, the patient’s blood culture grew gram-negative rods. She was presumptively treated with ceftriaxone, and the organism was confirmed to be S. Typhi by both the initial blood culture and subsequent blood cultures. The antimicrobial susceptibility pattern showed susceptibility to ampicillin, cefipime, ciprofloxacin, and ceftriaxone and resistance to cefazolin and gentamycin. The patient completed 14 days of intravenous ceftriaxone therapy without experiencing any complications. Cultures of blood samples obtained after completion of antibiotic therapy showed no growth.

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