13

A 16-Year-Old Girl from Malawi With Fever and Abdominal Pain

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Clinical Presentation

History

A 16-year-old Malawian girl presents to the emergency room of a local hospital because of fever, generalized abdominal pain and frontal headache for the past 5 days.

She delivered a baby 5 months ago. An HIV test done in the antenatal clinic was negative. Her further past medical history is unremarkable.

She lives with her parents, her three siblings and her baby in an urban high-density area. There is no running water and no electricity in the house. The family fetch water from a community tap. The girl went to primary school but recently dropped out during her pregnancy.

Clinical Findings

16-year-old girl in a fair nutritional state. Temperature 38.1°C (100.6°F), blood pressure 110/60 mmHg, pulse 78 bpm, respiratory rate 20 breath cycles per minute, Glasgow Coma Scale 15/15. There is mild scleral jaundice, no neck stiffness. The examination of the abdomen shows diffuse tenderness but no guarding. The liver is not enlarged, the spleen is palpable at 2 cm below the left costal margin. The chest is clear and there is no lymphadenopathy. Pelvic examination is unremarkable and there is no vaginal discharge.

Investigations

Her laboratory results on admission are shown in Table 13.1. The blood film for malaria parasites is positive, parasitaemia is described as "low". Liver function tests are not available because reagents are out of stock.

Questions

What are your most important differential diagnoses? How would you approach this patient?

Discussion

A 16-year-old girl presents with fever, abdominal pain and frontal headache. She has recently delivered a baby, otherwise her past medical history is unremarkable.

She is febrile, mildly jaundiced and there is diffuse abdominal tenderness with slight splenomegaly. There is mild normocytic anaemia. Malaria parasites are positive with low parasitaemia.

Answer to Question 1

What Are Your Most Important Differential Diagnoses?

Malaria could explain most of her signs and symptoms, even though her abdominal pain would be unusual. However, in a malaria-endemic area where large parts of the population are semi-immune, low parasitaemia is common and often subclinical. Nevertheless, malaria itself, particularly if combined with severe anaemia, is a predisposing factor for Gram-negative bacteraemia and sepsis.

Enteric fever (typhoid or paratyphoid) is another diagnosis to consider, particularly given her abdominal tenderness, her splenomegaly, her frontal headache and her relative bradycardia. Mild jaundice in enteric fever may be caused by hepatitis, cholangitis, cholecystitis or haemolysis.

TABLE 13.1 Laboratory Results on Admission

Parameter	Patient	Reference
WBC ($\times 10^9$/L)	3.2	4–10
Haemoglobin (mg/dL)	10.9	12–14
MCV (fL)	90	80–99
Platelets ($\times 10^9$/L)	164	150–400
Creatinine (μmol/L)	71	<80

In HIV-positive patients an infection with invasive non-typhoidal salmonellae (iNTS) should be considered.

Answer to Question 2

How Would You Approach This Patient?

Blood cultures should be taken in any febrile patient regardless of the malaria test result to rule out bacterial sepsis and enteric fever. Her HIV test should be repeated.

Since she is symptomatic and has malaria parasites in her blood, she should receive antimalarials according to the national guidelines and the local resistance profile. She should also be given broad-spectrum antibiotics to cover for Gram-negative and, less likely, Gram-positive bacteria. A urinary dipstick could quickly help rule out a urinary tract infection.

An abdominal ultrasound should be done to rule out post-hepatic causes of jaundice and to assess texture and size of liver and spleen.

The Case Continued…

On admission the patient was started on artemether/lumefantrine PO and a broad-spectrum antibiotic (ceftriaxone 2 g IV od). A repeat HIV test was negative. Blood cultures grew *Salmonella Typhi.* The antibiotic therapy was switched to ciprofloxacin 500 mg bid. On day 5 of antibiotic treatment the patient's fever started to settle and she was feeling better. She was discharged on day 7. Ciprofloxacin was continued for a total of 10 days. The patient was also given one dose of praziquantel, because co-infection with schistosomiasis seems to favour chronic carriage of *S. Typhi* and relapse, and Malawi is a country highly endemic for schistosomiasis.

SUMMARY BOX

Typhoid Fever

Typhoid fever caused by *Salmonella Typhi* is an exclusively human disease and there is no animal reservoir. Typhoid is clinically indistinguishable from paratyphoid, caused by *S. Paratyphi* A, B and C.

The enteric fevers, typhoid and paratyphoid, are endemic all over the tropical world. Incidence appears to be highest on the Indian subcontinent (approx. 500:100 000 per year in urban slums).

In endemic countries, enteric fevers are most common in children and adolescents, whereas adults have acquired immunity through previous exposures. Typhoid is usually acquired through ingestion of food or water contaminated by faeces of a patient or carrier. Overcrowding and poor sanitation are major risk factors.

The incubation period of typhoid fever averages 10 to 20 days (range 3–56). It is shorter in paratyphoid (1–10 days).

Symptoms are nonspecific with fever, headache, dry cough and abdominal pain. Other than in malaria, fever starts insidiously and may go unnoticed by the patient for some time. Temperature typically rises in the evening hours and patients may be afebrile in the morning. Constipation is common, but foul-smelling diarrhoea may occur during the course of an untreated infection. Patients may become confused and apathetic and, if untreated, may die of myocarditis, overwhelming toxaemia, intestinal perforation or haemorrhage.

Full blood count typically shows leukopenia. Low-grade anaemia and thrombocytopenia as well as slightly elevated transaminases are also common, but non-specific.

The definitive diagnosis of typhoid requires proof of *S. Typhi* in blood cultures or bone marrow. Isolation from stool or urine indicates carrier state but does not prove disease. The serological Widal test lacks both sensitivity and specificity and should be abandoned altogether. Novel and more promising serological tests are under development. Meanwhile, blood culture remains the diagnostic gold standard. In many low-resource settings, blood culture testing is however unavailable.

Patients with suspected enteric fever should be started on empirical antibiotic therapy. Antibiotic resistance patterns vary considerably between endemic areas. In many countries, antibiotic resistance is on the rise. Fluoroquinolones are the drugs of choice in areas without antimicrobial resistance because they reach very high intracellular concentrations. Third-generation cephalosporins or azithromycin should be used in South Asia where fluoroquinolone resistance is common.

Duration of treatment is between 1 and 2 weeks depending on the drug used. Case fatality rate on antibiotic treatment is <1%.

Apart from public health measures to improve safe water supply and sanitation, targeted vaccination of high-risk populations seems to be a promising strategy to control typhoid fever. Typhoid conjugate vaccines which can also be applied to children <2 years of age seem to be promising.

Further Reading

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