A Young Boy With High Fever and Lethargy

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By Carlos Quiros, MD [6]

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A 5-year-old boy is brought to the emergency department (ED) by his parents. They report that, for the past week, the child has had a high fever (temperature up to 40°C [104°F]), generalized weakness, lethargy, and lack of appetite. The boy’s eyes are bloodshot and he has refused food and drink. The child has no history of cough, shortness of breath, hematemesis, melena, headaches, vision problems, or seizures. He has not been in contact with sick persons, has not traveled abroad, does not have a pet, and is not taking any medications. His immunizations are up-to-date.

In the ED, the child is given amoxicillin for suspected pharyngitis and discharged. A maculopapular rash develops within 12 hours of the first amoxicillin dose, and the parents return to the ED with the child. Cephalexin is substituted, and the child is hospitalized. Despite therapy, the fever persists and the rash now covers the boy’s entire body.

Physical examination. The patient is a fairly well-built and well-nourished boy who looks ill: he is lethargic and very fussy. He weighs 20 Kg. His pulse rate is 120 beats/min and regular; temperature, 38.8°C (102°F); respiration rate, 22 breaths/min; blood pressure, 96/40 mm Hg. The sclera are icteric and the conjunctiva are severely injected. The lips are dry and chapped, and he has erythematous “strawberry” tongue and pharyngeal erythema. A large (1 X 2-cm) left anterior cervical node is noted. The diffuse erythematous maculopapular rash feels like sandpaper. His hands and feet are puffy; his palms and soles are erythematous.

Cardiovascular examination reveals tachycardia, displaced apex, and grade 2/6 holosystolic ejection murmur without a gallop.Expiration is prolonged with scattered wheezes and reduced air entry at bases. The boy’s abdomen is diffusely tender with guarding in the right upper quadrant. There is no palpable organomegaly; bowel sounds are present.

Laboratory studies. White blood cell (WBC) count, 37,400/μL. Hemoglobin, 9.9 g/dL; platelet count, 468,000/μL; polymorphonuclear leukocytes, 74%; erythrocyte sedimentation rate (ESR), 98 mm/h. Serum sodium level, 134 mEq/L; potassium, 4 mEq/L; chloride, 93 mEq/L; carbon dioxide, 20 mEq/L; blood urea nitrogen, 67 mg/dL; serum creatinine, 1.1 mg/dL; total bilirubin, 8.1 mg/dL; conjugated bilirubin, 6.7 mg/dL; alkaline phosphatase, 295 U/L; aspartate aminotransferase, 80 U/L; alanine aminotransferase, 100 U/L; albumin, 2.1 g/dL; amylase/lipase, normal. Urinalysis: protein 1+, bilirubin 2+. Ictotest, positive; WBC, 5 to 6 per highpower field (HPF); red blood cells, 4 to 5 per HPF. Lumbar puncture reveals 4 cells (all monocytes), with a protein level of 42 mg/dL and a glucose level of 75 mg/dL.

Ultrasonography of the abdomen shows free fluid. Results of blood tests, urinalysis, and cerebrospinal cultures are negative. An abdominal CT is ordered.

What abnormalities does the CT show—and to what diagnosis does the general clinical picture point?
WHAT’S WRONG:
The CT scan shows moderate ascites and periportal edema. The gallbladder is grossly dilated with no evidence of stone or obstruction (arrow). This finding is consistent with a diagnosis of hydrops of the gallbladder.

Based on the history, physical examination, and laboratory findings, your presumed diagnosis is:
A. Toxic shock syndrome
B. Rocky Mountain spotted fever
C. Kawasaki syndrome with complicated hydrops of the gallbladder
D. Leptospirosis
E. Stevens-Johnson syndrome

(Answer on next page.)

DISCUSSION

In a young child with persistent high fever, conjunctival injection, large lymphadenopathy, crusty lips, strawberry tongue, palmar and solar erythema, and puffiness of hands and feet, Kawasaki syndrome (KS) must be high on the list of diagnostic possibilities. The icterus and CT findings indicate hydrops of the gallbladder as an associated complication.

Based on these findings, the child in this case is hospitalized. An ECG shows tachycardia with a juvenile pattern. Echocardiographic findings include cardiomyopathy with an ejection fraction of 46% and severe tricuspid regurgitation, mild bowing of the right atrium, and paradoxical septal motion. There is no evidence of coronary aneurysm. Treatment is begun immediately with a single 30-g dose of intravenous immune globulin (IVIG) and aspirin, 1500 mg/d divided in 4 doses.

Outcome. Because of the development of congestive heart failure (CHF) and the possible need for surgical intervention, the child is transferred to a tertiary care center. There, he is intubated and given another dose of IVIG; aspirin is continued. The child improves gradually, with clearing of CHF, abdominal pain, icterus, rash, and adenopathy. He is discharged home on the 11th day. He continues to take aspirin, 81 mg/d, and will be followed by a pediatric cardiologist.

A CASE IN POINT

KS, or mucocutaneous lymph node syndrome, is an acute, self-limited exanthematous, febrile vasculitis found primarily in infants and young children. First described in Japan in 1967, the disease can affect all major body systems. It has surpassed rheumatic fever as the leading cause of acquired heart disease in children in the United States.

Clinical features. Half of cases occur in children younger than 2 years; 80% of those affected are younger than 4 years. The classic features are listed in the Table.

Other manifestations. Associated features include extreme irritability (especially in infants), anorexia, otitis media, pneumonitis, arthralgia, arthritis, aseptic meningitis, hepatic dysfunction, and diarrhea. Another unusual finding (rare in the United States but common in Japan) is erythema and induration of the BCG (bacille Calmette- Gurin) inoculation site. Peripheral ischemia with gangrene is a rare complication.

Acute hydrops of the gallbladder. This is a noncalculous, noninflammatory distention seen in infants and children with KS. It is characterized by the absence of bacterial infection, congenital anomalies, or calculi. The absence of inflammation and a generally benign prognosis distinguishes gallbladder hydrops from acalculous cholecystitis. Gallbladder hydrops may also be seen in children who have undergone prolonged parenteral nutrition or prolonged fasting, or who have leptospirosis, scarlet fever, staphylococcal infection, ascariasis, threadworm, sickle cell crisis, typhoid fever, thalassemia,
viral hepatitis, Henoch-Schönlein purpura, mesenteric adenitis, necrotizing enterocolitis, or sepsis. Symptoms include acute onset of crampy abdominal pain, nausea, and vomiting. Jaundice and fever may be present. The right upper quadrant is usually tender and the gallbladder may be palpable. Liver enzyme levels may be elevated. Ultrasonography reveals a distended echo-free gallbladder with no dilatation of the biliary tree.

Complications. In untreated patients, cardiac manifestations are the leading cause of morbidity and mortality. The most serious complication is coronary artery aneurysm, which may result in coronary artery thrombosis, stenosis, or myocardial infarction (MI). Coronary artery abnormalities occur in up to 25% of untreated patients; aneurysms are usually seen within 1 to 3 weeks of the onset of fever. Other cardiac manifestations include myocarditis, CHF, pericarditis, and pericardial effusion.

Laboratory features. Although laboratory test results in KS are nonspecific, certain findings are characteristic of the disease. The ESR and other acute-phase reactants may be elevated during the first week and may persist until the eighth week. The WBC usually ranges from normal to elevated with neutrophilia. Thrombocytosis occurs mostly during the second and third weeks. Thrombocytopenia is associated with severe coronary artery disease and MI. Other findings may include normocytic anemia, hypoalbuminemia, elevated levels of hepatic enzymes and serum immunoglobulin E, proteinuria, and sterile pyuria of urethral origin.

DIAGNOSIS
Because no single laboratory test can confirm the presence of KS, diagnosis is based on clinical features. It is confirmed if the patient has persistent fever and 4 of the other clinical criteria listed earlier—and if the symptoms cannot be explained by other known disease processes. Diseases that can mimic KS include measles, scarlet fever, toxic shock syndrome, staphylococcal scalded skin syndrome, Rocky Mountain spotted fever, juvenile rheumatoid arthritis, Stevens-Johnson syndrome and other drug reactions, leptospirosis, mercury poisoning, and other febrile viral exanthems.

TREATMENT
In the acute phase, treatment consists of a single dose of IVIG, 2 g/kg over 12 hours, administered within the first 10 days, and aspirin (according to the American Heart Association), 80 to 100 mg/kg, divided into 4 daily doses. The aspirin dosage is reduced to 3 to 5 mg/kg/d after the patient has been afebrile for several days. Aspirin is given for 6 to 8 weeks, until echocardiography shows no evidence of coronary artery aneurysm. If such evidence is found, aspirin is continued indefinitely. Management of gallbladder hydrops is nonsurgical; the condition generally resolves with the treatment of KS. Return of normal function usually occurs within a couple of weeks. In rare cases, the gallbladder is gangrenous, and a cholecystectomy is required.

References: FOR MORE INFORMATION:

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