A 2-Month-Old Male with Pyuria and Persistent Fever

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A 2-month-old male was admitted to the hospital because of 2 consecutive days of fever. On admission, the infant was febrile with normal skin turgor. Lung, heart, and abdomen were unremarkable at examination, and the only outstanding sign was a generalized macular rash on his trunk.

Laboratory exams showed a white blood cell count (WBC) of 10,300/mm³, with 58.8% neutrophils, 27% lymphocytes, and 5.7% monocytes; 10.1 g/dL of hemoglobin; and an elevated level of C-reactive protein (CRP, 18.6 mg/dL).

Urine analysis revealed pyuria (183 WBC/mcL). Sepsis related to a urinary tract infection was presumed, and intravenous ampicillin and gentamicin were started.

Abdominal ultrasound and echocardiography were performed and revealed normal findings. Fever persisted on the third day in the hospital despite antibiotic therapy, and the overall condition of the patient became worse.

Nonpurulent bulbar conjunctivitis appeared. Due to his fever, poor appetite, irritability, and signs of meningismus and opisthotonus, a lumbar puncture was performed after a magnetic resonance imaging (MRI) exam of the head was negative.

Cerebrospinal fluid (CSF) examination showed mildly elevated protein level (63.2 mg/dL) with normal glucose concentration and no cells. His blood, CSF, urine, and stool cultures were negative. Virologic tests (human herpesvirus 6, cytomegalovirus, herpes simplex viruses 1 and 2, enterovirus, and Epstein-Barr virus) were all negative by polymerase chain reaction.

Laboratory investigations showed an increment of inflammatory markers (CRP 27.1 mg/dL; fibrinogen 600 mg/dL) and leukocytosis (31,100/mcL). On the fourth day, thrombocytosis (platelets 696,000/mcL) was detected. On the fifth day of admission, a lab test was performed and revealed the diagnosis.

For diagnosis, see page 406

Editor’s note: Each month, this department features a discussion of an unusual diagnosis in genetics, radiology, or dermatology. A description and images are presented, followed by the diagnosis and an explanation of how the diagnosis was determined. As always, your comments are welcome via e-mail at Pediatrics@Healio.com.
Diagnosis:
Incomplete Kawasaki Disease

A repeat echocardiogram showed the lack of normal tapering and perivascular brightness of both left and right coronary arteries (see Figure 1 and Figure 2) leading to the diagnosis of incomplete Kawasaki disease (IKD).

Intravenous immunoglobulin (2 g/kg) with acetyl salicylic acid (ASA) (80-100 mg/kg/day) was begun, and after 48 hours a regimen of 5 mg/kg/day for the next 8 weeks was begun.

During the next 3 days the child showed marked improvement and normalization of laboratory tests. Desquamation of the fingertips developed on the 10th day of hospitalization.

The child was discharged 15 days after admission with low-dose ASA (5 mg/kg/day). Repeated echocardiogram on the 21st day after discharge showed complete normalization of coronary status.

Kawasaki disease (KD), also known as acute febrile mucocutaneous lymph node syndrome, is a self-limited vasculitis of unknown etiology often associated with coronary artery aneurysms. It is the leading cause of pediatric acquired heart disease. Due to the nonspecific symptoms and lack of a specific laboratory test, the diagnosis is based on the presence of fever for at least 5 days concurrently along with four of five clinical criteria: nonpurulent bulbar conjunctivitis; changes in mucosa of the oropharynx; changes in peripheral extremities; polymorphous exanthema; and unilateral cervical lymphadenopathy. However, many KD patients present with incomplete criteria.

Patients who do not fulfill the criteria are diagnosed with IKD, often based on echocardiographic identification of coronary artery abnormalities and high fever with fewer than four criteria.

Although infants and young children have the highest incidence of KD, it is rarely reported in infants younger than 3 months of age. The diagnosis in this age of group is difficult because the clinical picture is often incomplete and similar to other diseases.

DISCUSSION
In the first 6 months of life, KD is uncommon, consisting of 4% to 20% of all KD cases. Moreover, it is well known that there is a higher incidence of incomplete presentations of KD in younger infants than in older children.

Incomplete cases are patients who do not fulfill the diagnostic criteria but have fever and two or three criteria and often have coronary involvement;
Case Challenge

previous studies showed a higher incidence of coronary abnormalities in infants younger than 6 months.1

The diagnosis of IKD is difficult because many other infectious and inflammatory conditions may mimic its manifestations, such as Epstein-Barr virus infection and scarlet fever. In this case, the presentation of persistent high fever with pyuria and elevation of inflammatory markers suggested another diagnosis.

The infant was treated with intravenous antibiotic therapy without response, and fever and high levels of acute phase reactants persisted. Moreover, the worsening general condition with onset of meningism, nonpurulent conjunctivitis, and generalized rash prompted the performance of a second echocardiogram, which indicated coronary abnormalities.

Coronary abnormalities are almost pathognomonic for KD and are quite rare in other pediatric conditions.8,9 They validate the diagnosis of IKD when the clinical criteria of KD are not met.10 Thus, according to the algorithm presented by Newburger and colleagues,1 infants aged 6 months or younger, on day 7 or more of fever without other explanation for the febrile illness, should undergo laboratory testing. If evidence of systemic inflammation is found, then an echocardiogram should be considered, even if they have no clinical criteria for KD.

Perivascular brightness, ectasia, and lack of tapering of the coronary arteries in the acute stage of KD may represent coronary arteritis before the formation of aneurysms.1

CONCLUSION

This report highlights the importance of considering the diagnosis of IKD in infants who present with persistent high fever, elevation of inflammatory markers, and pyuria.

The unresponsiveness to antibiotic therapy and the persistence of the clinical and laboratory features should lead to an echocardiogram in order to establish an early diagnosis and enable specific treatment of IKD, which is frequently associated with cardiovascular damage in infants younger than 6 months. ■

REFERENCES