

Epstein-Barr Virus Infection

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A 6-year-and-10-month-old girl presented with a sore throat and fever of 3 days' duration. She denied cough, rhinorrhea, dyspnea, diarrhea, and genitourinary tract symptoms. She had no history of recent travel.

Physical examination. At physical examination, her temperature was 39.8°C, her pulse was 70 beats/min, and her respiratory rate was 16 breaths/min. Examination revealed pharyngeal erythema with a minimal exudate, tonsillar hypertrophy, and enlarged cervical lymph nodes. Results of a rapid strep test were positive, and amoxicillin oral suspension, 400 mg/5 mL, twice daily for 10 days was prescribed.

Three days later, she presented again with persistent fever, swelling of the upper eyelids, pharyngeal erythema, enlarged cervical lymph nodes, and hepatosplenomegaly but no rash (**Figure**).



Laboratory tests. Results of a complete blood cell count showed a white blood cell (WBC) count of $4500/\mu\text{L}$ (reference range, $4.4-10.8 \times 10^3 \mu\text{L}$) and a platelet count of $114 \times 10^3/\mu\text{L}$ (reference range, $130-400 \times 10^3 \mu\text{L}$). The differential count showed 21% neutrophils and 54% lymphocytes. The total bilirubin level was 0.9 mg/dL (reference range, 0.2-1.2 mg/dL), the alkaline phosphatase level was 304 U/L (reference range, 38-126 U/L), the aspartate aminotransferase (AST) level was 997 U/L (reference range, 10-45 U/L), and the alanine aminotransferase (ALT) level was 539 U/L (reference range, 5-40 U/L). Results of a mononucleosis spot test were positive for Epstein-Barr virus (EBV). Urine dipstick test results were normal. Infectious mononucleosis (IM) was diagnosed and was treated symptomatically.

One week later, the patient still had a fever with abdominal pain and occasional vomiting. Physical examination findings at that time were remarkable for enlarged cervical lymph nodes and hepatosplenomegaly.

Follow-up laboratory tests disclosed the following values: WBC count, $6600/\mu\text{L}$; platelet count, $291 \times 10^3/\mu\text{L}$; AST, 245 U/L; ALT, 240 U/L; EBV viral capsid antigen (VCA) IgM antibodies, $>160 \text{ U/mL}$ (reference range, 36-43.99 U/mL); and EBV VCA IgG antibodies, 67.1 U/mL (reference range, 18-21.90 U/mL). In the following few weeks, the patient recovered.

Discussion. At initial presentation, our patient received a diagnosis of a streptococcal infection and was treated with amoxicillin. However, she had a concomitant EBV infection. Despite amoxicillin use, a morbilliform rash did not occur. Approximately 30% of patients with EBV IM have group A streptococcal carriage of the oropharynx. However, swelling of the upper eyelids is uncommon in patients with IM.

EBV is common in humans and is most often transmitted by way of salivary secretions, but occasionally it is transferred during blood transfusion.¹ More than 90% individuals will have been affected by age 25, and approximately 25% will develop IM.¹

EBV infects the B cells in the oropharyngeal epithelium. Proliferation of these cells and reactive T cells causes lymphadenopathy. In immunocompromised individuals, uncontrolled proliferation of the EBV-infected B cells results in B-lymphocyte malignancies.²

Most patients with EBV infection are asymptomatic but may present with exudative pharyngitis. The most common presentation of IM is prolonged fever, fatigue, rash, pharyngitis, cervical lymphadenopathy, and hepatosplenomegaly. Ocular muscle pain, periorbital edema, jaundice, and palatal petechiae have also been reported.³ The WBC count is usually at 10,000 to 20,000/ μ L at 2 to 3 weeks of illness with more than 10% of WBCs being atypical lymphocytes.

Diagnosis is confirmed by positive mononucleosis spot test results, but it may take 1 to 2 weeks to become positive and may remain positive for 3 months. A greater than 40-fold antibody titer, the characteristic presentation, and atypical lymphocytes are diagnostic of EBV infection. A false-positive mononucleosis spot test result is common in connective tissue disease, lymphoma, viral hepatitis, and malaria.

EBV-specific antibody can be used in patients who lack heterophile antibodies. VCA IgM and IgG antibodies are elevated in 90% of cases.

Therapy for IM consists of supportive measures. Corticosteroids are indicated for established airway obstruction, autoimmune hemolytic anemia, severe thrombocytopenia, and hemophagocytic lymphohistiocytosis. Acyclovir has no significant role in the treatment of IM.

References

1. Epstein-Barr virus infections (infectious mononucleosis). In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2015:336-339.
2. Cohen JJ. Epstein-Barr virus infections, including infectious mononucleosis. In: Longo DL, Kasper DL, Jameson JL, Fauci AS, Hauser SL, Loscalzo L, eds. *Harrison's Principles of Internal Medicine*. Vol 1. 18th ed. New York, NY: McGraw Hill Professional; 2012:1467-1471.
3. Bennett NJ, Domachowske J. Pediatric mononucleosis and Epstein-Barr virus infection. Medscape. <http://emedicine.medscape.com/article/963894>. Updated November 2, 2017. Accessed December 5, 2017.