7-year-old boy with bilateral anterior cervical node enlargement from infectious mononucleosis

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Abstract

We report a 7-year-old boy with the clinical presentation of bilateral anterior cervical lymph node enlargement from infectious mononucleosis. Infectious mononucleosis is commonly caused by infection with the Epstein-Barr virus (EBV). Laboratory confirmation has low sensitivity with the Monospot test to detect EBV heterophile antibodies in children. Young children infected with EBV often remain asymptomatic and only rarely develop classic infectious mononucleosis. However, as this case highlights, EBV can present with atypical manifestations such as isolated cervical adenopathy. Health care practitioners should consider its varied clinical presentation and test accuracy to ensure proper diagnosis and management.

Case presentation

A 7-year-old boy presented to his health care practitioner with a 3-day history of bilateral swollen anterior cervical lymph nodes. He had a persistent low-grade fever (37.8-38.5°C) and nasal congestion for 3 days. There was no history of sore throat, difficulty swallowing, weight loss, or night sweats. He reported a history of lymph node swelling of the neck with a previous viral illness. His past medical history was unremarkable.

On physical examination he appeared well. Bilateral anterior cervical lymph nodes 5cm in diameter were present (Figure 1). No other lymphadenopathy was noted. Examination of the pharynx was normal with no upper airway obstruction. The spleen was mildly tender when palpated 3cm below the left costal margin. No rashes were found.

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Laboratory investigations showed an elevated white blood cell count (15.4x10^9/L) and an increased lymphocyte count (10.2 x10^9/L) with atypical lymphocytes present. His hemoglobin count (122g/L) and platelet count (155 x10^9/L) were normal. The Monospot test was negative. EBV specific serology 6 days after initial symptom onset showed indeterminate viral capsid antigen (VCA)-IgG, nonreactive early antigen (EA)-IgG, and nonreactive Epstein-Barr nuclear antigen (EBNA)-IgG. His tuberculin skin test was negative and urine shell vial culture tests for cytomegalovirus were negative. Tests for influenza A, influenza B, and respiratory syncytial virus (RSV) were negative. Throat swab for group A streptococcal infection was negative. Further testing showed mildly elevated alanine aminotransferase (102 U/L). An ultrasound examination of his neck showed reactive lymphadenopathy but no abscess in the swollen lymph node. Repeat EBV serology four weeks after initial presentation showed nonreactive VCA-IgG, EA-IgG, and EBNA-IgG. Concurrent VCA-IgM antibody testing was also negative.

The patient was placed on rest and restricted contact sports for 4 weeks. Within 12 days his symptoms resolved, and cervical lymph nodes were reduced in size and tenderness. His spleen remained mildly tender and enlarged to 2cm below the left costal margin.

The patient's symptoms and case presentation were atypical for infectious mononucleosis and his laboratory findings were not confirmatory. A referral was made to an infectious disease specialist who made a clinical diagnosis of infectious mononucleosis based on clinical presentation of bilateral cervical lymphadenopathy, splenomegaly, and atypical lymphocytosis.

Figure 1. Clinical presentation of bilateral anterior cervical adenopathy

Discussion

Acute infectious mononucleosis is a self-limiting viral infection typically caused by infection with Epstein-Barr virus (EBV).[1] EBV is a herpes virus that primarily infects B-lymphocytes resulting in viral replication.[2] B-lymphocytes can be latently infected and undetected by the immune system, acting as lifetime reservoirs for the virus.[2] Approximately 95% of adults worldwide have been infected with EBV with most cases of infectious mononucleosis occurring during adolescence.[2]

EBV is transmitted primarily through contact with saliva.[2] In adolescents, kissing is a common route of transmission.[3] In children, the method of transmission is unknown.[3] Poor hygiene, sharing items (such as drinking cups), and living within close proximity to infected persons are proposed routes of infection for children.[4,5]

Infectious mononucleosis can present with a diverse range of symptoms in adolescence and adulthood while young children tend to remain asymptomatic. Symptoms of mononucleosis typical of adolescents and young adults include lymphadenopathy, tonsillar enlargement, palatal petechiae, fever, sore throat, and fatigue.[6] Clinical findings of splenomegaly, axillary adenopathy, inguinal adenopathy, and posterior cervical adenopathy are most useful when considering a diagnosis of infectious mononucleosis.[7] Anterior cervical adenopathy is also possible.[6] Young children may present with subclinical or non-specific symptoms which can lead to missed diagnoses.[5,6] Our patient had a brief febrile prodrome associated with prominent cervical adenopathy measuring 5cm and splenomegaly – a relatively atypical clinical presentation for a young child. From observations of children in Mexico with acute EBV infection, presentations of lymphadenopathy, fever, general body pain, and pharyngitis are possible (Table 1).[8] Therefore clinicians should be aware of symptoms of infectious mononucleosis and complete confirmatory laboratory tests when necessary.

Table 1. Clinical signs of infectious mononucleosis in children

Sign	Percentage of Infected Children with Sign (n=163)
Lymphadenopathy	89.5%
Fever	79.7%
General body pain	69.3%
Pharyngitis	55.2%
Hepatomegaly	47.2%

Note: Adapted from Saldaña et al.[8] Study observed Mexican children exclusively and may have variable applicability to other populations.

A diagnosis of infectious mononucleosis can be confirmed using the Monospot test, a laboratory test for heterophile antibodies for EBV infection.[1] The test detects between 71-91% of cases in adults but only 25-50% of cases in children under the age of 12.[6,7] Additionally, the false-negative rate of heterophile testing is 25% in the first week of illness, approximately 5-10% in the second week, and 5% in the third week of illness.[6,7] Forty percent of children 4-years-old and younger do not develop detectable heterophile antibodies for EBV, making it difficult to accurately diagnose children using the Monospot test.[5] EBV serology testing for VCA-IgG, VCA-IgM, EBNA IgG, and EA-IgG are more accurate to confirm a diagnosis of mononucleosis.[5] These tests may be useful in patients with suggestive symptoms but negative heterophile results.

Clinicians should be aware that many viral illnesses may present with similar symptoms to those of EBV infection. Therefore, in case of inconclusive serology results, other pathogens such as *Streptococcus pyogenes*, influenza virus, herpes simplex virus, adenovirus, cytomegalovirus, toxoplasmosis, and human immunodeficiency virus should be considered.[9] Due to similar clinical presentations and inconclusive EBV serology, it is possible that the symptoms we describe were caused by a pathogen alternate to EBV. For unusual cases with negative EBV serology, such as ours, it may be reasonable to refer to an infectious disease specialist for assessment.

It is recommended that physicians advise rest as appropriate with proper continued food and fluid intake as management for this disease.[2] Splenic rupture is a rare but serious complication of infectious mononucleosis.[6] Therefore, physicians should advise patients to avoid contact sports for a minimum of 3 weeks to decrease risk of rupture.[5] Airway obstruction from lymph node enlargement is another potential complication, with young children at highest risk.[6] Corticosteroids may help reduce swelling, although caution should be exercised as it may also suppress immune response to the infection.[1]

Epstein-Barr virus infects approximately 95% of adults worldwide with most cases occurring during adolescence. Clinical and laboratory diagnosis of infectious mononucleosis may be challenging in childhood. Healthcare practitioners should be aware of the varied clinical presentations and consider the sensitivity of tests in children to ensure accurate diagnosis and management of infectious mononucleosis.

Consent

Family consent for the case and photo have been obtained in writing.

Acknowledgement

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