

Epstein-Barr Virus Encephalitis in Infancy

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ABSTRACT

Epstein-Barr virus (EBV) infection causes a wide spectrum of illness in humans including subclinical infection, infectious mononucleosis, and is associated with some malignancies. This report presents the clinical findings of an unusual case of EBV encephalitis in a 10-month old infant who presented with a febrile infection and seizures. The clinical manifestations, serologic study and a dynamic change of EBV DNA in cerebrospinal fluid with spontaneous recovery confirmed the diagnosis of EBV infection of the nervous system.

Keywords: Encephalitis, Epstein-Barr virus infection, infant

Encefalitis por el Virus Epstein-Barr en la Infancia

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RESUMEN

La infección por el virus de Epstein-Barr (EBV) causa un amplio espectro de enfermedades en los seres humanos, incluyendo infecciones subclínicas y mononucleosis infecciosa, y se asocia con algunas enfermedades malignas. Este reporte presenta los resultados clínicos de un caso poco usual de encefalitis por EBV en un niño de 10 meses que presentó una infección febril y convulsiones. Las manifestaciones clínicas, un estudio serológico y un cambio dinámico del ADN de EBV en el líquido cerebroespinal con recuperación espontánea, confirmaron el diagnóstico de infección del sistema nervioso por EBV.

Palabras claves: Encefalitis, infección por virus Epstein-Barr, lactante

West Indian Med J 2014; 63 (2): 206

INTRODUCTION

Epstein-Barr virus (EBV) infection causes a wide spectrum of illness in humans including subclinical infection, infectious mononucleosis, and is associated with some malignancies including nasopharyngeal carcinoma, Hodgkin's disease, Burkitt's lymphoma and primary central nervous system (CNS) lymphomas (1).

Neurologic symptoms have been well described and comprise seizures, polyradiculomyelitis, transverse myelitis, encephalitis and cranial nerve palsies (2, 3). These manifestations can occur alone or coincidentally with the clinical picture of infectious mononucleosis. The overall incidence of neurologic complications has been reported to be < 7% and CNS symptoms can be the sole manifestation of EBV

infection (4). Therefore, EBV has to be considered in a variety of acute neurologic illnesses. Although EBV encephalitis is a well-known entity, it is extremely rare under one year of age. Here, we report a 10-month old infant with EBV encephalitis.

CASE REPORT

A 10-month old male child was admitted with a three-day history of febrile infection and seizures. Physical examination revealed a temperature of 38.7 °C, blood pressure of 90/50 mmHg, pulse rate of 120/minute and respiratory rate of 36/minute. The patient was confused. There were hepatomegaly, splenomegaly and membranous tonsillitis. A complete blood count showed haematocrit of 24%, white blood cell (WBC) count of 22 000 cells/ μ L (58% neutrophils, 32% lymphocytes, 8% monocytes), and a platelet count of 155 000 cells/ μ L. A few atypical lymphocytes were observed in his blood smear. Blood chemistries including transaminases and a chest radiogram were normal. Meningitis was suspected and a lumbar puncture was performed revealing 50

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cells/ μL with 80% lymphocytes and normal protein and glucose levels. Empiric antibiotic and antiviral treatment was started with ceftriaxone and acyclovir. The first cranial computed tomography (CT) was normal. Because his fever continued five days after admission, lumbar puncture was repeated and showed 52 cells/ μL with 86% lymphocytes and a protein content of 97 mg/L in the cerebrospinal fluid. Serologic response to EBV was positive for specific antibodies to viral capsid antigen (VCA-IgM) and early antigen. Epstein-Barr virus DNA was detected by polymerase chain reaction (PCR) in the patient's cerebrospinal fluid. Serologic testing for Lyme borreliosis, listeriosis, cytomegalovirus, herpes virus and varicella-zoster virus and HIV, and PCR for herpes simplex virus was all negative. This confirmed the diagnosis of EBV infection with CNS involvement. Control cranial CT was obtained demonstrating left frontal cortex infarct and bifrontal effusion. A cranial magnetic resonance imaging (MRI) scan was obtained with similar findings. The patient was discharged home with a complete recovery after 14 days of antibiotic therapy. His follow-up brain MRI two weeks after the discharge showed resolution of previous findings.

DISCUSSION

Epstein-Barr virus may cause meningitis, encephalitis, cranial neuropathy, myelitis, anterior horn syndrome, radiculitis and polyneuritis; each can be observed in patients with or without infectious mononucleosis (3, 5, 6). The index patient did not have preceding or associated infectious mononucleosis, but had positive anti-EBV antibodies in the serum. Although typical MRI findings of EBV encephalitis are hypointensity in T1 weighted and hyperintensity in T2 weighted images with lack of diffusion restriction, a wide spectrum of imaging abnormalities ranging from normal to diffuse signal intensity changes either in grey or white matter can be seen (2, 7–10). The role of cerebrospinal fluid PCR in diagnosis of EBV infections of the nervous system remains to be determined because positive EBV PCR may be seen in patients with other viral or non-viral infections of the CNS (5, 11, 12). However, the diagnosis of EBV infection is ascertained by the detection of EBV PCR and a weakly positive VCA-IgM titre in the cerebrospinal fluid and serum. Although acyclovir has been recommended for the treatment of EBV encephalitis, the effectiveness of this therapy remains uncertain (13–15). Nevertheless, potential benefits of acyclovir outweigh the risks of the therapy as the index patient had an uneventful recovery with acyclovir.

In summary, we describe a previously healthy infant with acute EBV encephalitis without infectious mononucleosis. Epstein-Barr virus should be considered in a variety of acute neurologic illnesses even in infancy, and clinicians should consider the potential benefit from acyclovir treatment.

Authors' note

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. All authors declare that they have no conflicts of interest.

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