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Case study

Epstein-Barr virus acute encephalomyelitis in a 13-year-old boy

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ABSTRACT

The association of acute myelopathy and encephalopathy is reported in a 13-year-old boy. Signs and symptoms of infectious mononucleosis, presence of heterophile antibodies, anticapsid antibodies and Epstein-Barr virus DNA detected in cerebrospinal fluid, disclosed a primary or reactivated infection by Epstein-Barr virus. Outcome was rapid and benign with complete clinical recovery in 1 month, after pulse therapy with methylprednisolone. Epstein-Barr virus is a known agent related to acute disseminated encephalomyelitis, by immune mediated mechanisms. However, in this case, cortical involvement in magnetic resonance imaging, short time between infectious mononucleosis and central nervous system manifestations, and the presence of viral DNA in cerebrospinal fluid, raised the possibility of a direct action of the virus in central nervous system. Acute myelopathy associated to Epstein-Barr virus encephalitis has been rarely reported in children.

1. Introduction

Epstein-Barr virus (EBV) is one of the human herpesvirus. Infection in infants and children is usually asymptomatic or produces non-specific symptoms. In adolescents and adults, infectious mononucleosis with the triad of fever, lymphadenopathy and pharyngitis is the usual presentation.[1] Atypical lymphocytes in peripheral blood and presence of heterophile antibodies in serum are the classical laboratory findings in patients with infectious mononucleosis, but advances in sensitivity and specificity of serologic tests and detection of viral DNA by polymerase chain reaction (PCR) in cerebrospinal fluid (CSF) have expanded the knowledge on acute neurological complications of EBV as central nervous system (CNS) demyelination, meningoencephalitis, cerebellitis, aseptic meningitis, transverse myelitis, Guillain-Barré syndrome and cranial nerve palsies.[2–5]

We report a case of the unusual association of acute EBV encephalitis and acute myelopathy in a 13-year-old boy.

2. Case report

A 13-year-old, right-handed, Caucasian boy, was admitted for gait and standing difficulties, observed soon after waking up that morning. He was complaining of pain initially in left lower limb and then in both lower limbs. Urinary retention was observed too. Fever, sore throat, headache and intense lumbar pain had started a day before.

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At 4 months of age he had been submitted to a left nephrectomy for severe vesicoureteral reflux and hydronephrosis. At 6 years, he had been admitted for acute headache and vomiting with a normal computed tomography (CT) scan. There were not other remarkable personal or familiar antecedents.

At examination, tonsillar oedema and erythema with exudates on the right and bilateral posterior cervical adenopathy were present. Strength was decreased in right lower limb. Deep tendon reflexes were abolished in both lower limbs. A sensory level was not detected, and cutaneous abdominal and cremasterian reflexes were present. He could stand but not walk unaided. Bladder distension was observed at abdominal palpation and a vesical catheter was inserted. Blood cell count was normal.

During the next day, gait disturbances rapidly worsened and a short and self-limited generalised tonic–clonic seizure was observed. A load intravenous dose of phenytoin was administered. Abnormalities of mental functions were recorded after seizure, with recovery of consciousness and nonverbal communication but with confusion, expressive and comprehensive aphasia. There was symmetric paraparesis and cutaneous abdominal and cremasterian reflexes were abolished. We could detect a symmetric sensory level at L3. Meningeal signs were observed and ceftriaxone, vancomicine and dexametasone were prescribed. A brain CT scan was normal and the CSF examination at the third day of neurological symptoms showed 2 white cells/mm^3 without red blood cells. All these white cells were mononuclear, CSF glucose was 93 mg/dL and CSF protein was 48 mg/dL, without bacteria. Thus, antibiotics were withdrawn and dexametasone was replaced by pulse therapy with methylprednisonole for suspected acute disseminated encephalomyelitis (ADEM).

On the third day of neurological abnormalities, cranial MRI was obtained and showed abnormal multifocal cortical signal abnormalities, more prominent in both insulae (Fig. 1A and B) with unremarkable findings in spinal cord.

A new blood cell count was normal, but heterophile antibody test (Monotest®), IgM and IgG anticapsid antibodies for EBV were positive. ELISA for HIV was negative. Liver function was normal and C-reactive protein (CRP) was elevated (9.5 mg/L).

Complete improvement of language occurred 2 days after seizure and seizures did not recur even without long-term antiepileptic drugs. There was paraparesis and he could not stand, but sensory level had symmetrically changed from L3 to S3.

A new lumbar puncture was performed at the ninth day and CSF examination showed 26 white blood cells/mm^3 without red blood cells. All cells were mononuclear with normal CSF glucose (68 mg/dL) and normal CSF proteins (24 mg/dL). There were not intrathecal oligoclonal bands. PCR for herpesvirus family in CSF detected EBV DNA and was negative for cytomegalovirus, herpes simplex I and II, varicella zoster and human herpesvirus 6.

He left hospital at the 10th day of neurological symptoms. He was walking unaided with difficulties, requiring intermittent vesical catheterisation. Paraparesis was symmetric, deep tendon reflexes were increased, with bilateral Babinski.

A month after the first neurological symptoms, sphincter, motor and sensory functions had completely recovered.

3. Discussion

This patient developed manifestations of infectious mononucleosis with fever, pharyngitis and adenopathy, followed after few days by myelopathy and then encephalopathy. The myelopathy worsened during about 48 h with gradual improvement in 1 month. Encephalopathy was characterized by a seizure, decreased consciousness and language disturbances, following the myelopathy in 24 h. Encephalopathy manifestations were shorter than those of myelopathy, with complete clinical recovery in about 2 days.

Heterophile antibodies, increased IgG and IgM anticapsid antibodies and presence of viral DNA in LCR, detected by PCR, disclosed a primary or reactivated EBV infection. Other serologic tests, as IgG antibodies against nuclear antigens (anti-EBNA) could be useful in distinguishing a primary or reactivated infection but they were not performed. Atypical

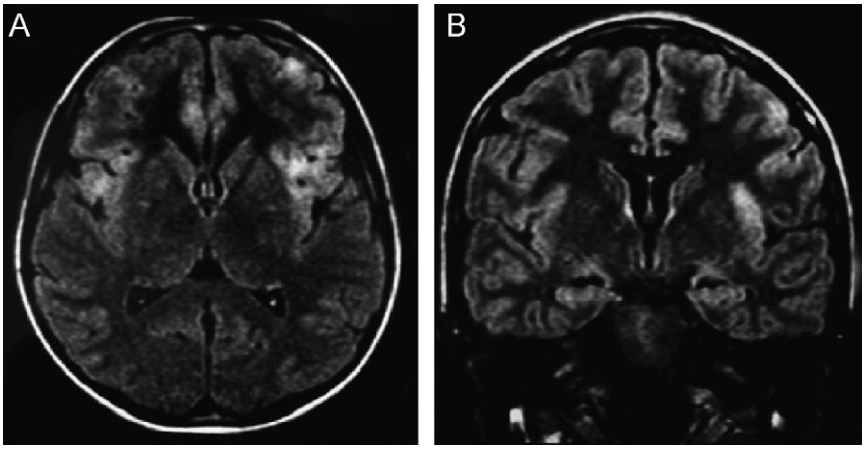

Fig. 1 – Axial (A) and coronal (B) MRI FLAIR sequences revealing multiple bilateral cortical high signal intensities predominantly in insular regions.