

# Epstein-Barr virus infection presenting as encephalitis in HIV—Phenomenon not seen frequently

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## Abstract

Epstein-Barr virus (EBV) infection can rarely present as encephalitis in HIV patients. We report a case of a 22-year-old female patient, diagnosed to have HIV infection 8 years back. She presented with headache and altered behavior for a week and focal fits for 2 days. Neurological examination was unremarkable. Cerebrospinal fluid (CSF) examination revealed lymphocytic pleocytosis with raised protein. EBV was detected in CSF using polymerase chain reaction test. Magnetic resonance imaging of the brain revealed T2/fluid-attenuated inversion recovery hyperintensities involving the left frontal cortex, left thalamus, and right medial temporal cortex. The patient was started on antiviral therapy considering the diagnosis of EBV encephalitis. The patient completely recovered over the next few weeks.

**Key words:** Encephalitis, Epstein-Barr virus, HIV

## Introduction

Patients with HIV infection are at higher risk of developing herpes central nervous system (CNS) infections. Among herpes viruses, cytomegalovirus, herpes simplex, and Epstein-Barr virus (EBV) are known to cause CNS

infections in HIV-positive patients.<sup>[1]</sup> EBV is a B-lymphotropic virus that is associated with a variety of lymphoid malignancies in immunocompromised patients,

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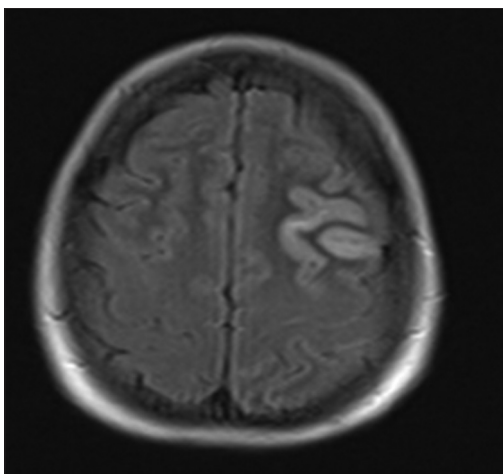


Figure 1: T2 fluid-attenuated inversion recovery sequence of magnetic resonance imaging brain showing hyperintensity in the left frontal cortex

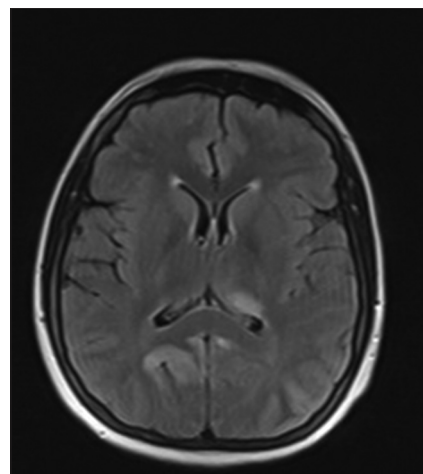


Figure 2: T2 fluid-attenuated inversion recovery sequence of magnetic resonance imaging brain showing hyperintensity in the left thalamus

including primary CNS and Burkitt's Lymphoma.<sup>[2]</sup> Rarely, it can also present as meningitis, encephalitis, transverse myelitis, and peripheral neuropathies.<sup>[3]</sup>

### Case Report

We report a case of a 22-year-old female patient, diagnosed to have HIV infection 8 years back. She was on antiretroviral therapy (ART) for the last 8 years. The patient had not been taking ART regularly for the last 2 years. Her CD4 count had gradually fallen to 238/mm<sup>3</sup> from 520/mm<sup>3</sup> over 2 years. She presented to us with complaints of headache and altered behavior for a week and focal fits for 2 days. She had holocranial, throbbing headache associated with episodes of vomiting. She was irritable and showed no interest in her surroundings. The mother found her muttering to herself for the last few days. She was scared and believed that someone wanted to kill her. Later, she had multiple fits in the form of right-sided facial twitching and clonic jerky movements of the right upper limb. There was no history of fever, neck pain, or loss of consciousness. Neurological examination was unremarkable. Her routine blood investigations were normal. CD4 count was 238/mm<sup>3</sup>. Cerebrospinal fluid (CSF) examination revealed total cell count of 30/mm<sup>3</sup> with lymphocytic predominance. CSF protein was 68 mg/dl, while sugar was 72 mg/dl. On further testing, EBV was detected using polymerase chain reaction (PCR) test. While tuberculosis PCR, virology (including herpes simplex, varicella-zoster, cytomegalovirus, and JC virus), syphilis, toxoplasma serology, cryptococcal antigen, bacterial, and fungal cultures were negative in blood and CSF. The quantitative viral assay showed a high level of EBV in CSF (42,864 copies/ml). Magnetic resonance imaging of the brain revealed T2/fluid-attenuated inversion recovery hyperintensities involving the left frontal cortex left thalamus and right medial temporal cortex [Figures 1 and 2]. The patient was started on antiviral therapy with valganciclovir considering the diagnosis of EBV encephalitis. The patient completely recovered over the next few weeks. She was discharged on antiepileptic and ART.

### Discussion

Viral encephalitis in HIV-infected patients can be due to HIV *per se* and various other opportunistic pathogens. Cytomegalovirus and herpes simplex are the commonest viral

infections of the CNS in HIV.<sup>[4]</sup> EBV infection can present as meningitis, encephalitis, and myelitis. These neurological complications usually occur after few weeks of the onset of acute infectious mononucleosis. EBV encephalitis has been reported in literature mainly in immunocompromised patients.<sup>[5]</sup> Rarely, neurological symptoms occur in the absence of systemic involvement as in our patient. Various hypotheses including infiltration of CD8 + T-cells into the neural tissue and deposition of antigen-antibody complexes in the endothelial tissue have been proposed.<sup>[6]</sup>

CSF PCR has been reported to be a useful quantitative test for diagnosing EBV-associated CNS disease.<sup>[7]</sup> It has a sensitivity of 80%.<sup>[7]</sup> Formal guidelines exist for the management of Herpes-simplex, cytomegalovirus, and Varicella-zoster-related encephalitis but not for EBV-associated encephalitis.<sup>[4]</sup> Ganciclovir and valganciclovir have been shown to reduce EBV viremia. There are reports of successful treatment of EBV-encephalitis with both these antiviral drugs.<sup>[8,9]</sup> Our case highlights EBV as opportunistic infection in HIV-infected patients which may occur at relatively high CD4 counts.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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