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Elsberg Syndrome Secondary to Cytomegalovirus Infection in an Immunocompetent Patient

A Case Report

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Abstract

Objectives

Infectious lumbosacral radiculitis and myelitis, a clinical entity called Elsberg syndrome, is classically linked to HSV-2 and VZV. Here, we report a case of an Elsberg syndrome caused by primary cytomegalovirus (CMV) infection in an immunocompetent patient.

Methods

Here is a case report at an academic medical center. Cerebral and spinal cord MRI, electroneuromyography, and serum and CSF analysis were performed.

Results

We investigated a 31-year-old healthy woman presenting with acute paresthesia of both feet ascending to the pelvic region, urinary retention, and constipation. Neurologic examination revealed symmetrical hyperesthesia of both inferior limbs up to the pelvic region, with patellar and Achilles hyporeflexia. Although MRI was normal, a dysfunction of the S1 left nerve root was observed on electroneurography. CSF analysis was inflammatory. Blood CMV PCR was positive, and anti-CMV IgG/IgM values indicated seroconversion. Taken together, these results strongly suggested an Elsberg syndrome caused by CMV primary infection. After a course of ganciclovir, a marked improvement of the symptoms was observed.

Discussion

This case highlights that CMV primary infection can be a cause of Elsberg syndrome in immunocompetent patients. CMV testing should be discussed in these patients to initiate adequate antiviral therapy.

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Glossary

CMV = cytomegalovirus; **CSF** = cerebrospinal fluid; **PMN cells** = polymorphonuclear cells.

A 31-year-old woman, in good health, complained of headache and chills. Then, over a week, she progressively developed neuralgic pain on the latero-inferior part of both thighs, ascending diffused tactile hyperesthesia from both feet to the pelvic region, urinary retention, and constipation. She had no weakness. Patellar and Achilles reflexes were hypovivid. Cutaneo-anal reflex and Babinski sign were negative. A chilled water bladder filling test did not show abnormal bladder contraction.

Brain and spinal cord MRI were normal. A dysfunction of sensitive fibers of S1 left root was observed on electroneurography, consistent with an acute cauda equina polyradiculopathy.

CSF analysis showed a marked elevation of leucocytes (87 M/l) with 98% monolymphocytes and 1% PMN, and elevation of proteins (0.66 g/L), with a positive CSF/serum albumin ratio. A multiplex PCR panel performed in the CSF (BIOFIRE FILMARRAY Meningitis-Encephalitis [ME] Panel), testing 14 different germs (including viruses, bacteria, and yeast), was negative. However, serial cytomegalovirus (CMV) serology values were consistent with a recent primary infection. Indeed, on admission day, the CMV IgM antibody level was strongly positive at 19.3 U/mL (N < 1), whereas the CMV IgG antibody level was slightly positive (at 1.9 U/mL [N < 1]). Four weeks after admission, the IgM index decreased at 5.2 and the IgG index increased at 3.8 (Table). In addition, CMV serology was negative in a blood sample performed a year before. CMV DNA was detected at a low level 3 days after admission. No other active infectious disease was detected in the serum, including HIV, A/B/C/E hepatitis, HSV1/2, EBV, VZV, and *Borrelia burgdorferi*. There was no finding suggesting an immune-mediated or a toxico-metabolic disease.

Once CMV primary infection was diagnosed, the IV acyclovir treatment (10 mg/kg/tid) initiated empirically was replaced by IV ganciclovir (5 mg/kg/bid) for 2 days, followed by valganciclovir (900 mg/bid) for 9 days. Neuralgic pain and hyperesthesia disappeared within 2 days after ganciclovir initiation. Urinary retention and constipation rapidly improved but remained problematic during 6 weeks after symptoms onset. Four weeks after admission, a second CSF analysis showed a decreased leucocyte count (15 M/l) and a normal protein level (Table).

Discussion

Elsberg syndrome is defined as an acute or subacute bilateral lumbosacral radiculitis, often accompanied by lower spinal cord myelitis, and is typically associated with HSV-2 and VZV infections.[1]

In this patient, clinical and paraclinical examinations confirmed a cauda equina polyradiculopathy. CMV primary infection was demonstrated by specific CMV seroconversion. Since the neurologic deficit was restricted to the peripheral nervous system, the negative PCR for CMV in the CSF was expected, similarly to what is observed in other subacute inflammatory peripheral nerve diseases, such as Guillain-Barré syndrome. In CMV polyradiculopathies, positive CSF PCR for CMV was found mostly in immunosuppressed patients with AIDS.[2,3,4]

The patient fulfilled Mayo Clinic diagnostic criteria for Elsberg syndrome.[1] Differential diagnosis may include MOG-IgG–related disease when radiculitis is associated with myelitis, which was not the case for this patient. We therefore concluded that the Elsberg syndrome was linked to primary CMV infection in this patient. Of note, neurologic complications of primary CMV infection in immunocompetent adults are rare. From 1950 to 2007, 290 cases were registered.[5] CMV infection was mostly diagnosed based on immunoglobulin class-switching from anti-CMV IgM to IgG antibodies during the course of illness. Gastrointestinal tract (mainly colitis) was the first site affected. Nervous system was the second site with 56 cases reported. Neurologic manifestations included myelitis, meningitis, meningoencephalitis, myeloradiculopathy, cranial nerve palsy, and polyneuropathy.[5] The pathogenesis of peripheral neuropathy

Table Biological Data of the Patient

	Anti-CMV IgM	Anti-CMV IgG	CMV PCR	CSF leucocytes
At symptom onset	22.9 U/mL (N < 1)	1.9 U/mL (N < 1)	Positive	87 M/L (N < 5)
One month later	5.2 U/mL	3.8 U/mL	Negative	15 M/L

Seroconversion of cytomegalovirus (CMV) showing the decrease of CMV IgM and the increase of IgG levels (symptom onset vs 1 month later) after acute CMV in the blood (PCR + at symptom onset).

after CMV infection remains unclear, in particular whether it is due to a direct toxic effect of the viral infection or due to autoimmunity triggered by molecular mimicry.[3]

To the contrary, CMV can cause various severe manifestations in immunocompromised patients through either primary CMV infection or reactivation of latent CMV infection.[5] Indeed, in immunocompromised patients, encephalitis, myeloradiculopathy, polyradiculopathy, and polyneuropathy secondary to CMV infection are classically reported.[6] Notably, a rapidly progressive polyradiculopathy, predominantly involving nerve roots, is well-described in association with CMV infection in AIDS or in transplanted patients.[2,7]

In immunocompromised patients, the prognostic of CMV polyradiculopathy without treatment is very poor with a 100% mortality rate. Under appropriate antiviral therapy, the symptom resolution most often takes weeks and may be partial.[4] In our case, the recovery was observed after a shorter course of treatment and may be explained by the fact that the patient was immunocompetent.[4]

A prompt diagnosis of CMV infection in immunocompetent patients with peripheral neurologic manifestations may improve their outcome through initiating an early and appropriate antiviral therapy.

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