

Short reports

Cranial and peripheral neuropathy due to Epstein-Barr virus infection

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Summary

A case of Epstein-Barr virus infection with neurological complications is described. An 18-year-old man developed cranial neuropathy and peripheral sensorimotor polyneuropathy three weeks after a sore throat. Though severely affected initially, he made a good recovery and no specific therapeutic intervention appears to have influenced his clinical course.

Keywords: Epstein-Barr virus, neuropathy

Neurological complications of Epstein-Barr infection are rare though well recognised. Cerebrospinal fluid (CSF) abnormalities may occur in up to a quarter of infected patients. The nervous system may be affected in the absence of classical glandular fever infection. The following case illustrates some of the many effects of Epstein-Barr virus on the nervous system, including aseptic meningitis, cranial neuropathy and sensorimotor polyneuropathy.

Case report

An 18-year-old student presented to his general practitioner three weeks prior to admission with a sore throat and was treated with penicillin. During the following fortnight he developed frontal headache, neckache and pains in his limbs. He became lethargic and anorexic. In the days prior to admission he developed an unsteady gait, double vision and parathesiae in the feet. Facial weakness occurred bilaterally and he presented to hospital.

He was found to be extremely unwell. Temperature was normal and general systems examination revealed tender cervical adenopathy. The abdomen was tender in the left upper quadrant but splenomegaly was not detected. There was nuchal rigidity and Kernig's sign was positive. He had bilateral ptosis with bilateral sixth nerve palsies and diminished superior and inferior gaze. Seventh nerve palsies were severe bilaterally. The patient was dysarthric with decreased tongue movement.

Neurological examination of the upper limbs was normal. Assessment of power and tone in the lower limbs was limited by pain but extreme weakness was evident. There was diminished pin-prick sensation on both soles but other sensor modalities were intact. The reflexes were normal and both plantar responses were flexor.

Blood film examination showed normal white cell count with atypical lymphocytes. The erythrocyte sedimentation rate was 6. Monospot test was positive. Liver function test were raised in a hepatic pattern. Aspartate transaminase was 105 IU/l (normal 8–40), alanine transaminase 290 IU/l (normal 0–50), and alkaline phosphatase was normal.

The patient had a positive titre of IgM to Epstein-Barr virus. CSF examination on admission revealed 49 lymphocytes/mm³ and 3 g/l of protein with normal glucose. Forty-eight hours later, CSF contained 23 lymphocytes and 12 g/l protein. Nerve conduction studies showed a severe demyelinating and axonal sensorimotor polyneuropathy. Motor conduction velocity in the right median nerve was 22 m/s. There were profuse fibrillations and positive sharp waves in right tibialis anterior and vastus lateralis. Plasma exchange was initiated during the first week of admission.

The patient's condition deteriorated initially and he developed complete ophthalmoplegia. Power was reduced distally in the upper limbs and there was decreased pin-prick sensation in the finger tips. Lower limb reflexes were absent. The situation began to improve during the second week of admission; the speech improved, eye movements began to return to normal, and facial weakness started to improve. Eventually power began to return to the lower limbs. Eight weeks after initial presentation the only findings were weakness of neck flexion and of ankle dorsiflexion. The ankle jerks were still absent.

Discussion

It is 60 years since the rare but well recognised neurological complications of Epstein-Barr virus infection were first described. The reported incidence is between 0.37% and 7.3%.¹ These sequelae of glandular fever can be classified into lymphocytic meningitis, encephalitis, mononeuropathy, polyneuropathy and spinal cord lesions.² Our case showed evidence of lymphocytic meningitis, cranial nerve involvement and polyneuropathy. Guillain-Barre and Miller-Fisher syndromes have been reported in association with this virus infection but these do not satisfactorily describe this case.^{3,4}

Lymphocytic meningitis was the first neurological complication of Epstein-Barr virus infection to be described in 1931 and is the most common.⁵ Our patient had features of meningitis and his CSF showed a lymphocy-

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tosis. The CSF may be abnormal in more than 25% of glandular fever patients.¹

Encephalomyelitis may present with a combination of cerebral, cerebellar, brainstem and spinal cord signs. Seizures may occur, as can stupor and coma, with or without focal deficits. Recovery has occurred even in patients with decorticate and decerebrate rigidity.³ Polyneuropathy is the second most common neurological complication of glandular fever. Our patient showed evidence of severe demyelinating and axonal polyneuropathy. This weakness was most extreme in the lower limbs but was also evident in the arms, particularly distally. The loss of power and loss of deep tendon reflexes in the legs did not develop until nuchal rigidity and cranial nerve involvement, with ophthalmoplegia and bilateral seventh nerve palsies had been present for more than 48 hours. Antiganglioside antibodies were measured in the serum and these were negative. They are positive in 5–15% of Guillain-Barre cases and 90% of cases of the Miller-Fisher syndrome. Their role in pathogenesis is unclear.⁶ CSF findings were not classical of Guillain-Barre syndrome.

Two cases of the Miller-Fisher syndrome have been reported in association with Epstein-Barr virus infection.⁴ The clinical course was benign and patients recovered spontaneously. Involvement of a number of isolated nerves has been reported in particular, anosmia, optic neuritis, palsies of third, fourth, sixth and seventh nerves, also the long thoracic nerve of Bell. Hypoglossal nerve involvement may occur.⁷ The nerves most commonly involved are the second and seventh usually with bilateral facial weakness. Brachial plexus

Neurological features of Epstein-Barr virus infection

- lymphocytic meningitis
- encephalitis
- transverse myelitis
- polyneuropathy
- mononeuropathy

neuropathy though unusual has been seen, and can occur in conjunction with other neuropathies.¹

Transverse myelitis secondary to Epstein-Barr virus infection has also been documented.⁸ CSF examination showed pleocytosis and raised protein. Magnetic resonance imaging of the thoracic cord demonstrated abnormal signal intensity. The patient recovered rapidly after a course of intravenous steroids. In this case, polymerase chain reaction for Epstein-Barr virus DNA was used.⁸ Lumbosacral radiculopathy with a good prognosis has also been reported in association with this virus infection.⁹

Some of the cases found in the literature, along with our own patient, were given courses of steroids. Prognosis for both treated and untreated patients appears excellent and steroids do not seem to alter the outcome.

This case illustrates the varying complications of Epstein-Barr infection on the nervous system. Though severe, the prognosis is excellent and despite the fact that no therapy seems to alter the clinical course effectively, most patients can expect to make a good recovery.

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