

SHORT REPORT

Intracranial hypertension and HIV associated meningoradiculitis

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Abstract

Two patients with meningoradiculitis associated with HIV presented with symptoms and signs of intracranial hypertension. In the patients described, the raised intracranial pressure resolved after lumbar puncture. After exclusion of opportunistic infection, such patients may be managed with therapeutic lumbar puncture alone.

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Opportunistic infection and neoplasms of the nervous system are common complications of AIDS. In addition, HIV is neurotropic, and neurological involvement may occur at any stage during the course of HIV infection from the time of seroconversion.¹ In this report we describe two patients who presented with intracranial hypertension early in the course of HIV infection.

Patient 1

A 41 year old African woman presented with a nine month history of headache and one week of visual obscurations and tinnitus. She had lost 17 kg in weight in the preceding year, but there were no other systemic symptoms, and she was not on any medication. She had visual acuities of 6/5 bilaterally with normal colour vision. Perimetry showed symmetric enlargement of the blind spots and, on fundoscopy, bilateral chronic papilloedema was seen. Neurological and general examinations were otherwise normal.

Brain MRI and magnetic resonance angiography (MRA) were normal. At lumbar puncture, CSF pressure was raised at 38.5 cm water with a protein concentration of 0.77 g/l and 27 white cells/mm³ (97% lymphocytes). Glucose concentration in CSF was 3.2 mmol/l (blood glucose 5.4 mmol/l). Oligoclonal bands were detected in CSF and serum, but there were additional bands in the CSF not present in the serum. Culture of CSF was negative for bacteria, fungi, and acid fast bacilli; CSF cryptococcal antigen, polymerase chain reaction

for toxoplasmosis, and syphilis serology were negative. Antibodies to HIV-1 and HIV-2 were detected in serum. *Cytomegalovirus* serology was positive (IgG positive, IgM negative), but CSF and other viral serology were negative. There was a mild normochromic, normocytic anaemia (haemoglobin 11.2 g/dl) and a lymphopenia ($1.1 \times 10^9/l$) with a CD4 count of $260 \times 10^6/l$. Erythrocyte sedimentation rate was 61 mm/h, and total serum protein was raised at 93 g/l due to a polyclonal increase in γ -globulins. Routine biochemistry, serum and CSF angiotensin converting enzyme, hepatitis B serology, HTLV₁ serology, clotting screen, autoantibody screen, and chest radiography were normal.

Empirical antituberculous therapy was commenced pending the CSF cultures, but the patient did not comply with the treatment. After the lumbar puncture the headache and papilloedema resolved spontaneously over a period of four weeks, but examination showed loss of the knee and ankle tendon reflexes, without any weakness or sensory disturbance. The upper limb reflexes were normal, and the plantar responses were flexor. Nerve conduction studies were normal. Repeat lumbar puncture disclosed a normal opening pressure of 12.5 cm water, with a protein concentration of 1.27 g/l and 34 white cells/mm³ (100% lymphocytes). Three months later, when last assessed, she was complaining of headache again. The papilloedema had not recurred, but the knee and ankle tendon reflexes were still absent. Brain CT was normal, and CSF pressure was 13.5 cm water. The CSF protein remained increased at 1.13 g/l, but the white cell count had fallen to 5 cells/mm³. The headache settled without treatment.

Patient 2

A 23 year old African woman presented with headache and diplopia. She had been well until seven weeks before presentation when she developed severe intermittent headache. After five weeks of headaches, she developed horizontal diplopia and progressive unsteadiness of gait. There was no medical history of note, and she was not on any regular medication. She had visual acuities of 6/6 bilaterally with normal colour vision. On perimetry, bilateral enlargement of the blind spots was

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found, and fundoscopy disclosed bilateral acute papilloedema with peripapillary haemorrhages, cotton wool spots, and retinal folds. There was bilateral lateral rectus weakness and lower motor neuron facial weakness. Tone and power were normal in the upper limbs, but there was grade 4 weakness of hip flexion, knee flexion, ankle dorsiflexion, and ankle plantarflexion bilaterally. Upper limb reflexes were normal, but the knee and ankle tendon reflexes were absent. Both plantar responses were flexor. Sensation and coordination were normal. There was cervical lymphadenopathy, but general examination was otherwise normal.

Brain MRI and MRA were normal. Spinal MRI showed faint enhancement of the lumbar nerve roots after gadolinium but no other abnormality. Lumbar puncture disclosed a CSF pressure of 39 cm water with a protein concentration of 1.3 g/l and 42 white cells/mm³ (100% lymphocytes). Oligoclonal bands were present in both CSF and serum. Glucose in CSF was 3.0 mmol/l (blood glucose 4.6 mmol/l). Culture for bacteria, fungi, and acid fast bacilli was negative. Cryptococcal antigen was not detected in CSF. Nerve conduction studies and EMG were normal. Antibodies to HIV-1 were present in serum. Angiotensin converting enzyme was slightly raised in serum at 56 IU/l (normal < 53 IU/ml), but was normal in CSF. Chest radiography was normal. There was no evidence of granuloma formation or lymphoma on cervical lymph node biopsy or bone marrow biopsy, and culture of both specimens for acid fast bacilli was negative. Full blood count was normal, and the CD4 count was 780 × 10⁶/l. Erythrocyte sedimentation rate was 37 mm/h, and there was a polyclonal increase in γ -globulins. Toxoplasma and CMV IgG antibodies (IgM negative) were detected in serum but not CSF; HTLV₁, syphilis, and borrelia serology were negative. Routine biochemistry and autoantibody screen were normal.

While awaiting the results of tuberculosis cultures, empirical treatment with rifampicin, isoniazid, pyrazinamide, and ethambutol was started. Subsequently prednisolone (60 mg/day) was started. The headache, lateral rectus palsies, and facial weakness rapidly resolved after the first lumbar puncture. A lumbar puncture performed one week after presentation disclosed a CSF pressure of 15 cm water with a protein concentration of 1.1 g/l and 28 white cells/mm³. During the first two weeks the power in her lower limbs deteriorated. At three weeks the CSF pressure was 23 cm water with a protein concentration of 1.2 g/l and 5 white cells/mm³. Repeat nerve conduction studies and EMG, six weeks after the initial examination, were compatible with a lumbosacral radiculopathy with absent peroneal F waves bilaterally, prolonged F wave latencies from both tibial nerves, and evidence of denervation in the tibialis anterior and vastus medialis. Motor nerve conduction velocities and sural sensory action potentials remained within normal limits. Two to three months after the initial presentation the power in her

lower limbs had almost completely recovered. During the same period the papilloedema resolved. Antituberculous therapy was stopped and a reducing regimen of steroids continued.

Discussion

Both patients presented with symptoms and signs of raised intracranial pressure without an intracranial mass or ventricular enlargement and were subsequently found to have serological evidence of HIV infection.

Intracranial hypertension is a recognised complication of cryptococcal meningitis in AIDS.¹ Both our patients had a lymphocytic meningitis, but there was no evidence of cryptococcal infection, and the CD4 counts of greater than 200 make opportunistic infection unlikely. Having made a careful search for other potential causes of chronic meningitis, the lymphocytic meningitis is most likely to have represented an HIV associated meningitis. Up to 60% of seropositive patients have a chronic low grade meningitis, which is usually asymptomatic.¹ Intracranial hypertension can occur as a complication of viral meningitis, but it is rare.² In a study of 14 patients with HIV associated meningitis, although the CSF pressure was 20 cm water or greater in five patients, it was only above 25 cm in one patient and papilloedema was not seen.³

Patient 2 had clinical and neurophysiological evidence of a lumbosacral radiculopathy. This progressed during the first two weeks and then improved over the subsequent two to three months. Bilateral facial weakness was also present, but this resolved rapidly after the initial lumbar puncture suggesting that it was the result of raised intracranial pressure. Patient 1 developed absent knee and ankle tendon reflexes, but there was no weakness. Nerve conduction studies, performed acutely, were normal, but a follow up study was not available. Acute and chronic inflammatory demyelinating neuropathies are rare but well recognised in early HIV infection.⁴ Although the pathogenesis of these neuropathies remains speculative, it has been suggested that autoimmune mechanisms, analogous to those in Guillain-Barré syndrome and chronic inflammatory demyelinating neuropathy unrelated to HIV infection, are involved.⁴ Intracranial hypertension is a recognised complication of both diseases, unrelated to HIV infection, and there is one report of intracranial hypertension developing four weeks after the onset of Guillain-Barré syndrome associated with HIV infection.⁵ The clinical presentation in patient 2 and possibly also patient 1 could be considered similar to those patients reported with Guillain-Barré syndrome and intracranial hypertension.

Four other patients with intracranial hypertension without an intracranial mass or ventricular enlargement have been reported in patients with HIV infection.⁶⁻⁹ Unlike our patients, all four were known to be HIV positive when they developed intracranial hypertension and none had a radiculopathy. One patient had neither evidence of opportunistic

infection nor HIV associated meningitis,⁷ and may have represented a chance occurrence of idiopathic intracranial hypertension and HIV infection. Two patients had an aseptic meningitis,^{8,9} but both had been receiving co-trimoxazole, which has been previously associated with intracranial hypertension.¹⁰ Although in one patient the intracranial hypertension recurred after withdrawal of the co-trimoxazole, it is difficult to exclude co-trimoxazole as an aetiological factor in these two patients. In the remaining case, the intracranial hypertension was attributed to treatment with amphotericin.⁶

Although the temporal link with the meningoradiculitis in our patients makes a chance occurrence of idiopathic intracranial hypertension and HIV infection unlikely, and they were not receiving any medication, the mechanism of the raised intracranial pressure is uncertain. Impaired absorptive function of the arachnoid villi secondary to the raised CSF protein concentrations was proposed as an explanation of the raised intracranial pressure in Guillain-Barré syndrome, but this hypothesis has since been questioned.¹¹ The most parsimonious explanation is that the chronic meningitis itself caused impaired CSF absorption, and certainly the raised intracranial pressure did not recur when the CSF lymphocytosis had resolved despite persistent raised CSF protein.

In patient 1, the CSF lymphocytosis and raised intracranial pressure resolved with no treatment other than a lumbar puncture. Patient 2 followed an essentially similar

course, and it remains uncertain whether this was influenced by the treatment given. It would seem reasonable, after exclusion of any opportunistic infection, to manage such patients with therapeutic lumbar puncture only.

In summary, two patients presented with intracranial hypertension and an HIV associated meningoradiculitis. The differential diagnosis of intracranial hypertension without an intracranial mass lesion or ventricular enlargement in patients with HIV infection should include idiopathic intracranial hypertension, drug treatment, and cryptococcal meningitis.

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