Case Reports

HIV Encephalopathy

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HIV is a neurotropic virus which finds sanctuary in the CNS, where it may survive indefinitely. Soon after the initial descriptions of pediatric AIDS, CNS involvement was recognized as a frequent manifestation(l). The exact pathogenic mechanism of neurologic dysfunction and destruction remains an area of active research(2). In this report, we have described a case of AIDS encephalopathy with a positive Western blot in blood and CSF and basal ganglia calcifications.

On examination, the patient had Grade IV protein-energy malnutrition with generalized pyoderma, severe oral thrush and molluscum contagiosum. There was no significant lymphadenopathy. The patient was in a decorticate posture with intermittent decerebration and responded only to deep painful stimuli. There was generalized hypertonia with brisk reflexes, contractures at all large joints and a positive Babinski's sign. The fundus showed bilateral optic atrophy. There was no meningeal or cranial nerve involvement.

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Investigations revealed normal blood counts; the total WBC count was 10,500/ mm^3 with 60% lymphocytes. ESR was 112 mm fall at the end of the first hour. Other biochemical parameters were normal. CSF examination was also unremarkable. The patient was confirmed to be having HIV infection on ELISA {Rapid ELAVIA MIST (HIV 1 and 2) Sanofi's Diagnostic Pasteur and Genetic System Corporation USA}, Western blot (developed in-house from HIV-1 viral lysate at the Cancer Research Institute) and PCR (by amplification of the gag region 115 basepair fragment) testing of blood.

The CSF Western blot was also positive. PCR testing on CSF was not possible as there were no cells in the CSF. The CD_4/CD_8 ratio was 0.8 by the peroxidase technique (normal values 1.5 to 2.3). Hypergammaglobulinemia was present, with IgG=2,400 mg/dl (N=820 to 1070 mg/ dl), IgA=80 mg/dl (N=75 to 170 mg/dl) and IgM=78 mg/dl (N=40-90 mg/dl). CT scan brain showed cerebral atrophy with mild ventricular dilatation and bilateral symmetrical basal ganglia calcifications *(Fig. 1)* MRI showed generalized cerebral atrophy.

Discussion

In this case, the whole family was affected by HIV. We postulated that first the mother acquired the infection, perhaps through infected blood, and subsequently transmitted the infection sexually to her husband and transplacentally to both children. This patient presented at 6 years age with HIV encephalopathy, in the absence of other generalized infection or systemic involvement. Basal ganglia calcification which is characteristic of HIV encephalopathy in an HIV positive patient, is an ominous sign, indicating a poor prognosis(3).

There is a tendency for HIV-related CNS disease to parallel progression and severity of systemic disease and immuno-deficiencies. However, some patients may develop HIV-related CNS diseases as the first or only sign(3), in the absence of other major AIDS defining events or opportunistic infections, as seen in our patient.

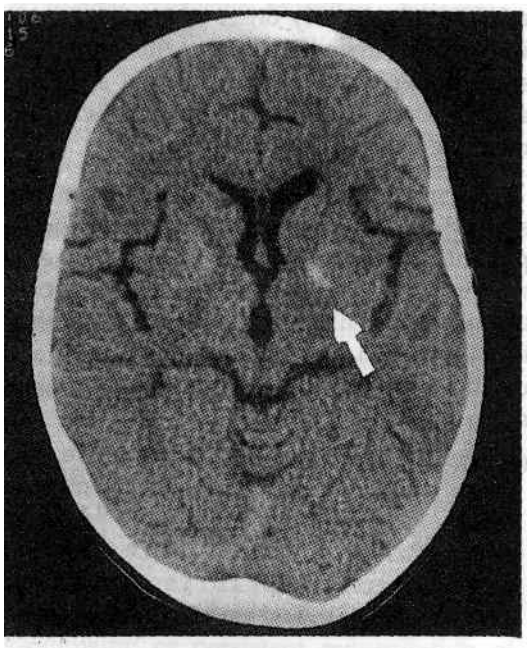

Fig. 1. Basal ganglia calcification in HIV encephalopathy

Clinically, two types of encephalopathy have been described. In the most severe form there is a progressive deterioration in cognitive, motor, language and adaptive functions with loss of previously acquired skills and milestones. Terminally, spastic quadriparesis with pseudobulbar and extra-pyramidal signs occur, as were seen in our case. In the more static variety, there is little or no further development of skills, resulting in a decline in IQ scores, and associated motor deficits (4).

HIV, like other lentiviruses, requires macrophage tropism for tissue invasion (5). The infected peripheral monocyte transports the virus into the CMS. Neuronal damage is mediated via astrocytes and cell to cell interactions which amplify the inflammatory process through arachidonic acid metabolites and neurotoxic cytokines(5). Neuronal dysfunction through loss of supporting growth factors, excitotoxicity due to dysregulation of neurotransmitter reuptake and increased permeability of the blood-brain barrier permit further seeding of the HIV-I in the CNS(6).

When our patient presented with progressive spasticity and deteriorating mentation, in view of his HIV status, we suspected Progressive Multifocal Leuco Encephalopathy (PMLE) or HIV encephalopathy. However, the presence of basal ganglia calcifications in a known case of HIV is pathogonomic of HIV encephalopathy(3) and this confirmed the diagnosis. PMLE is extremely rare in childhood and the CT and MRI brain scan did not reveal any evidence of a leucoencephalopathy. Western blot positivity in CSF confirmed a HIV related CNS disease.

Some of the other causes of basal ganglia calcifications include Huntington's chorea, Hallervorden-Spatz disease, Wilson's disease and pseudohyperparathyroidism(7). However, on the basis of family history, normal

serum calcium, and normal serum copper and ceruloplasmin levels, these possibilities were excluded. There is an increased incidence of tuberculosis in HIV infected patients as was seen in this family. Both parents had pulmonary tuberculosis and the patient himself had tuberculous meningitis, a year before he was detected to be HIV positive.

In our case, all three modes of transmission, via infected blood, sexual and transplacental, were noted in one family. With advanced CNS involvement, the prognosis for our patient remains grim. Although viral load within the CNS can be reduced by antiretroviral drugs like azidothymidine which have a good CNS penetration, further treatment is perhaps not indicated under the circumstances.

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