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Case Report

Clinical analysis of neurological system complications in AIDS and HIV positive patients

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Abstract

Objective: To report the clinical manifestations of AIDS with nervous system complications. **Methods:**We collected the clinical material of AIDS and HIV positive patients who were admitted to our hospital from January 1998 to July 2006, and retrospectively analyzed the 39 cases having nervous system complications, among 146 cases in total. **Results:**Among 39 cases, there were 3 cases of HIV dementia, 1 case of vacuolar myelopathy, 3 cases of Gullain-barre syndrome, 3 cases of myopathy and 26 cases of secondary opportunistic infection of CNS,including 9 cases of tuberculosis, 6 cases of cryptococcus, 5 cases of toxoplasma, 3 cases of herpes zoster virus, 2 cases of herpes simples virus, 1 case of cytomegalovirus, 1 case of progressive multifocal leukoencencephalitis. 2 cases with central nervous system lymphoma.Among them 12 patients gave up treatment, other patients received anti-HIV treatment and anti-microorganism treatment. 5 patients died of respiratory failure, 2 patients died of multiple organs failure. **Conclusion:**Up to now, AIDS still has not very good management. So prevention is very important.

Keywords: AIDS; HIV; nervous system

INTRODUCTION

Nervous system is susceptive site for HIV attacking. We report 39 cases of patients with neurological system complications of 146 cases of AIDS and HIV positive patients who were admitted in our hospital from January 1998 to July 2006.

CASE REPORT

General materials

Males $n = 29$, Females $n = 10$. Among them 15 cases were drug-abusing, 23 cases had unhealthy sexual intercourse, and 1 case had been transfused with blood. 28 patients were married, 11 cases were single. The age range was from 22 years old to 56 years old. The mean age was 34 years old.

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Major neurological complications and diagnoses

MRI manifestations

A MRI scan of 2 cases of cryptococcus encenphalitis patients showed cryptococcomas (or gelatinous pseudocysts) appearing in high densities on T1-weighted sequences. The same lesion in the CT scan also showed low densities foci. The MRI scan of 2 cases of toxoplasma encephatitis showed as a ring-enhancing lesion surrounded by vasogenic edema (with smaller foci of enhancing nodules or "satellite" lesions) after administering gadolinium. 1 case of CMV encephalitis taking an MRI scan showed a lesion involved in the brainstem as well as periventricular regions and demonstrated ventriculitis, infarcts, meningitis and cranial neuritis. On T1-weighted and T2-weighted sequences the lesions contained hypodensities. CT findings included diffused white matter hypodensity, ependymal enhancing and focal "ring-enhancing" or "nodular-enhancing" lesions and also enhancement of ependyme and nerve roots. 1 case of progressive multifocal leu-

koencephalitis showed extensive white matter with high signal on T2-weighted sequences and flair sequences, and post gadolinium T1-weighted images showed bifrontal white matter non-enhanced. 1 case of primary CNS lymphoma took an MRI scan which showed a ring-enhancing lesion in the left frontal lobe while another patient showed similar lesions in the right basal ganglia region(shown in ***Tab 1***).

Other complications

Tab 1 **Major Neurologic Manifestations of HIV Infection**

N	$CD4^+/mm^3$	Diagnosis	Symptoms	Neurologic Signs	Diagnostic Studies
6	<200	Crypt meningitis & encephalitis	all had fever, headache, neck stiffness,1 had memory loss, 1 had seizures	5 showed lethargy, confusion, meningeal signs, 3 had cranial nerve palsies;	all were positive in CSF India ink, 5 were positive in serum and CSF crypt antigen. CT/MRI positive
5	<200	Toxoplasma meningitis & encephalitis	5 had headache, fever, 2 showed confusion,1 displayed lethargy and seizures	2 showed Dementia,confusion, hemiparesis	all were Toxoplasma antibody positive CT/MRI multiple enhancing lesions, edema
9	<200	tuberculosis meningitis & encephalitis	all displayed fever,cough, headache, 6 had neck stiffness	5 showed lethargy, confusion; 7 had meningeal signs; 3 had cranial nerve palsies	CSF showed cell count 220~518 $\times 10^6$/L; 39%~52%glucose 0.82~1.7mmol/l; protein 10 mmol/L; PCR method, Tb-antibody positive, chests-X-ray positive
3	<200	herpes zoster meningitis	all had headache, fever, rashes	all had rashes; 2 had meningal signs, confusion;tempreture39.1~40℃	CSF showed cell count 87~209 $\times 10^6$/L; glucose mormal; Cl^-normal; protein 0.56-1.02g/L; PCR positive
2	<200	herpes simple	headache, fever	1 had confusion; tempreture38.8-39.3℃	CSF manifest: monocyte 102~212 $\times 10^6$/L; glucose and Cl^- normal; protein0.78-0.92g/L; PCR positive
3	<200	HIV dementia	all had memory loss, behavioral change,2 had gait disorder, unconcentrated	all had Dementia; 2 displayed spasticity; 1 showed psychosis	CT/MRI:brain atrophy, white matter abnormalities
1	<100	progressive multifocal leukoencephalitis	lethargy, confusion, weakness	hemiparesis ataxia, visual disturbance	CT/MRI:multiple hypodense nonenhancing white matter lesions
1	<50	cytomegalovirus encephalitis	confusion, apathy, weakness, blindness	Dementia, cranial neuropathies, spasticity	CT/MRI:periventrical and meningeal abnormalities, CSF PCR positive
1	<200	vacuolar myelopathy	gait dysfunction, lower extremity weakness, urinary dysfunction	spastic paraparesis, Barbinski signs, sensory abnormalities	MRI/CSF: normal or nonspecific abnormalities
3	<200	Guillain-barre syndrome	weakness in four limbs	weakness in four limbs, lower tendon reflexes	all displayed CSF dissociation of protein and cell counts
3	<200	myopathy	all had weakness in four limbs atrophy of muscle	weakness in four limbs, lower tendon reflexes	all displayed a slightly enhancement of myo–kinase
2	<100	central nervous system lymphoma	all had headache, confusion, lethargy,memory loss, seizures	dementia, hemiparesis, aphasia	CT/MRI:enhancing lesions,(especially if single),1 case autopsy positive

Among 39 cases of AIDS patients, 9 cases were pulmonary tuberculosis present, 11 cases had oral mucosal mycotic plaque, 13 cases were found with fungal infection in feces smears, 12 cases with hepatitis B, 8 cases with hepatitis C, 1 case with spontaneous peritonitis, 21 cases with weight loss, 19 cases with diarrhea, 15 cases with enlargement of lymph nodes, 15 cases with anemia, 13 cases with thrombocytopenia and 24 cases with low albuminemia.

Treatment and prognosis

12 patients gave up treatment, other patients received anti-HIV treatmant and anti-microorganism treatment, 5 patients died due to respiratory failure, 2 patients died of multiple organ failure.

DISCUSSION

Neurological complications of HIV infection are common since HIV can attack the $CD4^+$ lymphocyte, cross the blood-brain barrier and enter the nervous system at all levels of the neuraxis(brain, meninges, spinal cord, peripheral nerve and muscle).The frequency of neurological complications varies according to the stage of the disease, and it has been reported that neurological lesions are the initial manifestations of AIDS in 10% to 20% of symptomatic HIV infections, 30% to 40% of patients with AIDS will have clinical neurological dysfunction. Based on pathological findings of patients

with advanced-stage AIDS, neurological lesions may be present in 75% to 90% of cases[1-3].HIV-related neurological disease is classified into direct complications and indirect complications. The former are complications caused by HIV infection, such as the AIDS-dementia complex, HIV-related seizures, subacute encephalopathy, vacuolar myelopathy, aseptic meningitis, distal symmetric sensory polyneuropathy and myopathy. The pathophysiology underlying these direct complications remains poorly understood. The indirect complications include autoimmune phenomena, malignancies such as lymphoma, and opportunistic infections secondary to immune deficiency. Secondary infections which include cryptococcus, toxoplasma, tuberculosis ,virus, eurotium, histoplasma capsulatum, nocardia asteroids, mucor and so on[4,5]. In this group of neurological complications of AIDS, there were 26 cases of secondary opportunistic infections of CNS, including 9 cases of TB(34.7%), 6 cases of cryptococcus(23.4%), 5 cases of toxoplasma (19.27%) and 6 cases of virus infections(19.27%), which including 3 cases of herpes zoster, 2 cases of herpes simple and 1 case of cytomegalovirus. Although initially it was concerned that HIV-infected patients with TB might be more infectious, considerable data suggest that HIV-infected patients are similarly or perhaps even less infectious than non-HIV-infected patients with TB. The study showed HIV-infected patients had lower rates of sputum smear-positive TB than those of non-HIV-infected patients[6], and HIV-infected patients with smear-positive pulmonary TB had a lower burden of myolobacterial organisms and were less likely to have cavitary disease[7].Cryptococcosis is a leading cause of the morbidity and mortality attributable to fungal infections in patients with AIDS, about 6% to 10% of patients with HIV infection have been estimated to develop cryptococcal meningitis. Fever and headache are the most common symptoms, occurring in about 65% to 90% of patients, less common are photophobia and neck stiffness. Focal neurologic deficits and seizure are unusual. Cytomegalovirus disease is now may occur in more than 40% of AIDS patients[8]. The most common and feared disease presentation of CMV in AIDS patients is CMV retinitis, occurring almost exclusively in individuals with an absolute $CD4^+$ cell count below 50/mm^3. Besides secondary infection, secondary tumors are also common in AIDS. EBV has also been implicated in the pathogenesis of HIV-related primary central nervous system lymphoma. According to Telling KA *et al.*[9] 50% to 100% of central nervous system lymphomas in AIDS patients contain the EBV genome. The mo-lecular mechanism of this association, however, has not been elucidated at present and has not provided any practical clinical treatment clues. Progressive multifo-cal leukoencephalitis is linked with JC virus infection and the diagnosis could be made by MRI manifestation, PCR method positive of JC virus and clinical manifes-tation[10]. Besides central nervous system infection, pe-ripheral neuropathy and myopathy are also common. About 15%-20% AIDS patients in their late stage of progress were concomitant with dementia in most pa-tients with $CD4^+$<200/mm^3. Currently we still haven't obtained a satisfactory management of AIDS, so pre-vention is very important[11-13].

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