Cytomegalovirus and Varicella Zoster Meningoencephalitis, and Ischemic Stroke in an HIV-AIDS patient: a Case Report

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INTRODUCTION

Along with the increasing number of newly diagnosed HIV patients per day (26 new cases/day) 1 is an increasing number of HIV patients diagnosed with Central Nervous System Infection (CNSI) and Stroke. After adjusting for demographics, ischemic stroke risk factors, comorbid diseases, and substance use, a study shows that the risk of ischemic stroke was higher among male with HIV infection compared with uninfected people (hazard ratio 1.17)2.

This report aims to present a case of a known Human Immunodeficiency Virus (HIV) patient with decreased sensorium and focal neurologic deficit and was found to have Cytomegalovirus (CMV) and Varicella Zoster Virus (VZV) Meningoencephalitis and Ischemic Stroke.

CASE PRESENTATION

A 35 year old male, single, Roman Catholic, right-handed, working as a graphic designer was brought to the Emergency Department due to decreased sensorium. He is diagnosed to have HIV one year ago presenting with Pneumocystis jirovecii pneumonia with an initial CD4 of less than 200. He is poorly compliant to Lamivudine, Tenofovir and Nevirapine. Four months prior to admission, patient had Shingles.

On admission, patient was seen cachectic, incoherent and with unremarkable systemic physical examination. Neurologically, he has spontaneous eye opening, he moans to questions but doesn't follow commands. His pupil are anisocoric with preferential gaze to the left and right homonymous hemianopsia but no nystagmus. He shallow right nasolabial fold, has weak gag and his tongue is midline. He can move his extremities spontaneously more on the left and withdraws to pain on right however all extremities are spastic. He has nuchal rigidity and tested positive for Brudzinski's and Kernig's. He is hyporeflexive in all extremities. Fundoscopy showed no papilledema or exudates. However, he was noted to have relative afferent pupillary defect and hazy media on the right eye but the left eye has clear media with normal vessels and disc.

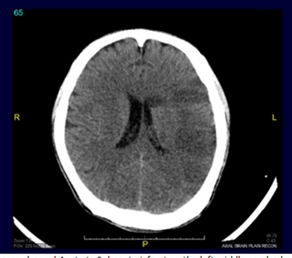

Figure 1. Cranial CT scan showed Acute to Subacute infarct on the left middle cerebral artery territory

He is managed as a case of Cerebrovascular disease and was empirically started on Vancomycin, Ampicillin, Cefepime and Ganciclovir for possible Central Nervous System Infection.

Table 1. Serologic Studies

Serologic Test	Result
CD4 T helper-cells	11 count cells/mm^3 (NV: 581- 1,177)
HIV-1 RNA RT PCR	1,124,215 copies/mL
Rapid Plasma Reagin	Nonreactive
Cryptococcal Antigen Latex Agglutination	Negative
CMV IgG	65 U/mL (NV: <4)
Toxoplasma gondii IgG	0 IU/mL (NV: <4)

Antibacterials were discontinued and Acyclovir was started on top of Ganciclovir. On the fourth hospital day, ultrasound of the eyes revealed vitreous opacities on the right eye and was managed as a case of CMV Chorioretinitis. Magnetic Resonance Imaging and Angiogram was done (see Figure 2).

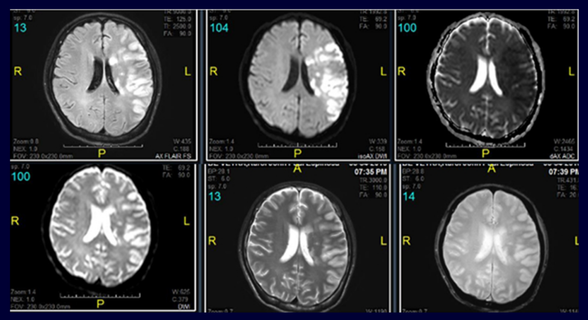

Figure 2. MRI/MRA showed previous infarcts with associated long segment occlusion of the insular and opercular branches of the left middle cerebral artery with paucity of the cortical branches

Table 2. Cerebrospinal Fluid Studies

CSF Test	Result
Opening Pressure	17.4 cm
Description	10-15 mL cloudy free-flowing fluid
CSF Protein	120.9 mg/dL (NV: 15- 45)
CSF Glucose	42. 0 mg/dL (NV: 40-70)
CSF Total Cell Count	1,880 cells/uL
CSF WBC Count	40 cells/uL, lymphocytes
CSF RBC Count	1,840 cells/uL Crenated: 12% Non-crenated: 88%
CSF Viral Panel	634,000 copies/mL CMV Viral Load
	Herpes Simplex Virus 1 DNA: Negative
	Herpes Simplex Virus 2 DNA: Negative
	Varicella Zoster Virus DNA: Negative
	Dengue Virus IgM: Negative
	Japanese Encephalitis Virus IgM: Negative
CSF Varicella Zoster Virus IgG	44.4 mIU/mL
CSF Bacterial Antigen Test	Streptococcus group B: Negative
	H. influenza B: Negative
	Streptococcus pneumonia: Negative
	N. meningitidis ACY W135: Negative
	N. meningitidis B/E. Coli K1: Negative
CSF Bacterial Culture	No growth after 3 days
Cryptococcal Antigen Latex Agglutination	Negative
CSF Mycobacteria PCR	Negative
CSF Mycobacteria Culture	No growth after 42 days
CSF Fungal Culture	No growth after 14 days

DISCUSSION

According to a study on HIV Infection and Stroke by Benjamin, et. al (2012), admissions of patients in the USA with stroke and concurrent HIV infection have increased by 43% over 9 years. Ischemic stroke seems to be more frequent than cerebral hemorrhage in patients with HIV, as in this patient. Identified causes of ischemic stroke include HIV-associated vasculopathy, opportunistic infections or neoplasia, cardioembolism and coagulopathy 3. HIV-associated vasculopathy may be attributed to direct damage to the endothelium by the HIV virion or viral particles or indirectly, such as if with opportunistic infections, where there is increase in the subendothelial population of HIV infected monocytes. The inflammatory cascade in infections promote atherosclerosis, plaque rupture, and thrombosis, leading to ischemic stroke4 and immunosuppression caused by HIV increases susceptibility to acquisition or reactivation of these infections3.

Since the patient has suppressed immune status with a CD4 of 11 count cells/mm3 and HIV-1 RNA of 1,124,215 copies/mL, the consideration of CNSI is considered an AIDS-defining illness. In an immunocompromised host, an elevated CSF CMV viral load by PCR (634,000 copies/mL) is diagnostic of CMV Meningoencephalitis while an elevated CSF VZV Serology IgG (IgG 44.4mIU/L) is a sensitive indicator of VZV vasculopathy. A study by Nagel (2007) concluded that the diagnostic value of detecting VZV IgG antibody in the CSF is greater than that of detecting VZV DNA5. One of the most serious ocular complication in HIV is CMV chorioretinitis which this patient also had. It is said to be related to CMV vasculitis and is considered a CMV end-organ disease which is an independent predictor of ischemic stroke among PLWHA6. We then consider a CMV with concomitant VZV Meningoencephalitis in an HIV patient who also presented with stroke. Another study done by Nagel, et. al (2010) claims that the three most well-studied virus in stroke are Varicella Zoster Virus, Cytomegalovirus and Human Immunodeficiency Virus7. Based on the viral panel, Acyclovir was started and Ganciclovir was continued. Vancomycin, Cefepime and Ampicillin were discontinued.

CONCLUSION

There are 26 cases of newly diagnosed HIV per day and also, an increasing number of Central Nervous System Infection and Stroke in patients with HIV. The opportunistic infections are an emerging cause of stroke with PLWHA. The more immunosuppressed, the more prone one is in acquiring opportunistic infections. This might be the first reported case of co-infection of the three most documented viruses that causes stroke, Cytomegalovirus, Varicella Zoster Virus and Human Immunodeficiency Virus. Initiating antiretroviral therapy is the most important part of management in cases like this. Empiric antimicrobials and lumbar tap are cornerstones in the management of CNSI in the immunocompromised host.

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