



A Study of Neurological Manifestations of HIV in a Tertiary Care Centre

Authors

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Abstract

Introduction: Neurological manifestations of HIV consists of CNS complications caused directly by HIV, and include cognitive disorders and other CNS disease such as myelopathy and the demyelinating neuropathies and the secondary disorders caused by opportunistic infections, neoplasm, cerebrovascular events, as also the effects of metabolic derangements and medications.

Aims And Objectives

- 1) To study the spectrum of neurological manifestations in HIV infected subjects.
- 2) To study the correlation of neurological manifestations with CD₄ count.

Materials and Methods: This is a cross sectional study conducted in 100 HIV patients admitted in King George Hospital, in whom a detailed history and clinical evaluation done, after an informed consent from the patient or relative.

Study Period: October 2017 to September 2019

Inclusion Criteria: All HIV Patients admitted at king George hospital in medical and neurology wards

Exclusion Criteria: Immuno Compromised state due to any other cause.

Results: The following were the details of neurological manifestations. Tuberculous meningitis (35.4%), cerebrovascular complications (9.67%), Guillian barre syndrome (3.22%), pyogenic meningitis (6.44%), peripheral neuropathy (6.44%), seizure disorders (6.44%), acute flaccid paralysis (3.22%), AIDS dementia complex (3.22%), cerebellar syndrome (3.22%), cryptococcal meningitis (3.22%), Toxoplasmosis (3.22%), HIV myelopathy (3.22%), Tuberculoma (3.22%). Mortality increased most with coexisting meningitis and with decreased CD₄ counts. Commonest neurological condition associated was neurotuberculosis.

Conclusions: Incidence of neurological illness in HIV infection in our study was 31%. All patients in our study had heterosexual transmission of disease. Headache and altered mentation were the two common symptoms observed in this study. Tuberculous meningitis was the most commonest opportunistic infection in our study. No significant CD₄ count correlation was found between the patients with neurological manifestations. CD₄ count when less was associated with increased mortality. Patients with coexisting tuberculous meningitis and HIV infection had significantly lower CD₄ counts.

Introduction

HIV can affect any level of neuraxis, and at least one third of patients with advanced HIV infection will develop neurological complications during the course of their illness and 10% of cases neurological problems may be first sign of development of AIDS. But at autopsy, more than 80% of patients show

evidence of cerebral pathology ranging from HIV encephalitis, opportunistic infections or lymphomas and some evidence of peripheral neuropathy.

Aims and Objectives

- To study the spectrum of neurological manifestations in HIV infected subjects at various level.

- To study the correlation of neurological manifestations with CD₄ count.

Materials and Methods

This is a cross sectional study done in KGH, conducted from october2017 to September 2019

- 100 HIV patients admitted at KGH over a period of 2 years were chosen for the study.
- Detailed history and clinical evaluation which included the mini mental score (MMSE) was done, after an informed consent from the patient or relative.
- Routine blood investigations, CSF analysis, CD4 count, chest x ray, creatinine phosphokinase, CT MRI were done.

Methodology of Investigation

HTV testing and CD4 count were done by microbiology department in our hospital as per NACO Guidelines.

CD₄ count was done with Facs Count (Automated Counter). Tests were done in a single laboratory by the same person, no interpersonal error was possible.

Exclusion Criteria

Immuno Compromised state due to any other cause

Limitations

Culture and PCR for mycobacterium could not be done.

Viral Serology was done only in selected patients.

Results and Observation

- 31 patients had neurological manifestations among the 100 patients studied
- Of the 100 patients studied 80 male and 20 were female. Among the 80 males 28 had neurological manifestations and of the 20 females , 3 had neurological symptoms
- In our study most of the patients were drivers (56%) and neurological symptoms were also common among these group of patients
- Among 31 patients who had neurological symptoms 4 patients had pulmonary TB as co infection

Age Distribution

Age in Years	Positive	Negative	Total
<30	4 25%	15 75%	19
31-40	19 31.6%	41 68.3%	60
>40	8 38.09%	13 61.91%	21

Majority of the patients in our study were between 31-40 yrs of age. Of the 60 Patients, who were in the age group of 31-40, 19 (31.6%) had neurological symptoms.

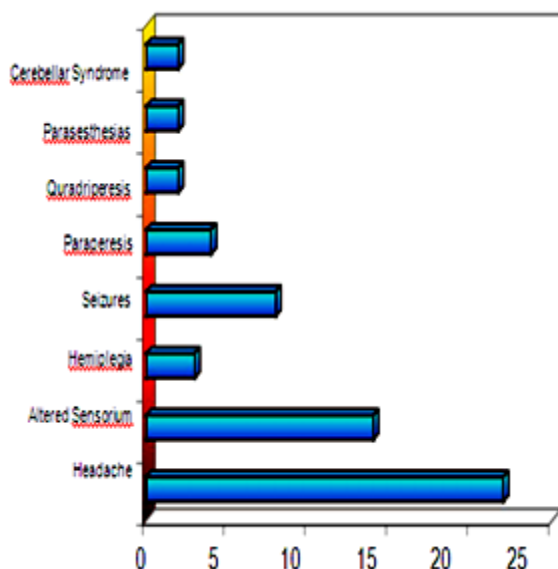
Clinical Presentations

Clinical Presentation	Frequency	Percentage
Headache	22	38.6%
Altered Sensorium	14	24.56%
Hemiplegia	3	5.26%
Seizures	8	14.03%
Paraperesis	4	7.01%
Quradriperesis	2	3.5%
Parasesthesias	2	3.5%
Cerebellar Syndrome	2	3.5%

Disease Pattern

Diagnosis	Frequency	Percentage
Acute Flaccid Paralysis	1	3.22%
AIDS Dementia Complex	1	3.22%
Cerebellar Syndrome	1	3.22%
Cryptococcal Meningitis	1	3.22%
Toxoplasmosis	1	3.22%
Cerebrovascular Accident	3	9.67%
Guillian Barre Syndrome	1	3.22%
HIV Myelopathy	1	3.22%
Meningoencephalitis (Cause not determined)	1	3.22%
Multiple Granuloma	1	3.22%
Myopathy	1	3.22%
Peripheral Neuropathy	2	6.44%
Pyogenic Meningitis	2	6.44%
Seizure Disorder	2	6.44%
TB Meningitis	11	35.4%
Tuberculoma	1	3.22%

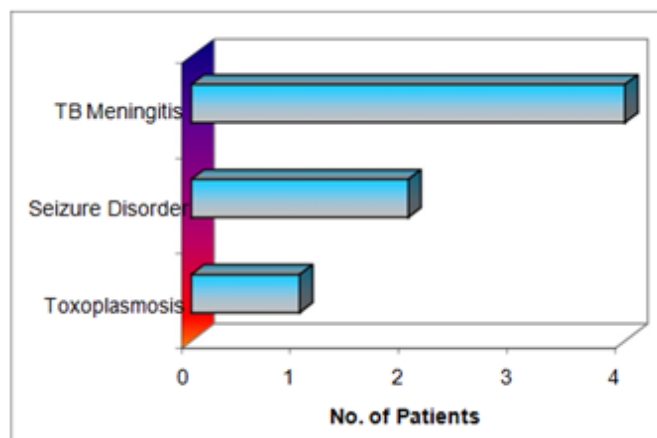
Altered Sensorium



CD4 Correlation with Mortality

Out Come	CD4 Mean	Count SD
Expired	108.38	41.65
Improved	268.60	110.94

Convulsions



CD4 Count Correlation

	CD4 Count	
	Mean	SD
Patient with Neurological Manifestation	179.19	113.16
Patient without neurological Manifestation	225.03	134.58

CD₄ count levels in Patients with neurological manifestations ranged from 11 and 535 with an average of 179.19. The average CD₄ levels in Patients without neurological manifestations was

225.03. There was no statistically significant difference between the two groups. (P>0.05)

The mean CD₄ Count of the patients who expired was 108.38. Mean CD₄ count of the patients and who improved were 231.78 and 268.60. There is a statistically significant correlation of CD₄ count among patients who expired (P-0.003**).

CD₄ Correlation with TB Meningitis

	No. of Cases	Mean	SD
Patients with TB Meningitis	11	140.88	43.161
Patients without Neurological Manifestation	69	245.02	138.585

Mini Mental Score

	Mean	MMSE	
		SD	
Patient with Neurological Manifestation	24.94	2.13	
Patient without neurological Symptoms	26.65	0.84	

Out Come

Out Come	Frequency	Percentage
Improved	20	64.52%
Expired	11	35.48%

11 Patients who had neurological manifestations in the study group expired (35.48%) and 20 Patients had improvement in their clinical condition.

CSF Analysis

Analysis was done for 20 patients in the study. 11 Patients had elevated proteins and predominant lymphocytes. 4 Patients had normal CSF. 2 had elevated proteins and a cellular smear. 2 patients had predominant neutrophils. 1 had elevated proteins and occasional lymphocytes and also had positivity for cryptococcus in India Ink preparation.

CT Brain

24 Patients in the study were subjected to CT Brain among which 3 patients had middle cerebral arterial territory infarct and 1 had multiple calcified granulomata.

MRI

In this study 4 patients had MRI brain done for them. 1 had multiple ring enhancing lesions who was diagnosed to have Tuberculoma and other patients had features suggestive of normal pressure hydrocephalus

Discussion

- In this study, of the 100 seropositive patients, 31 had neurological manifestations (31%). The incidence of neurological manifestations in HIV positive patients according to snider et al was 31% and levy et al was 39%. In India Gupta et al found an incidence of 25.75% in his study.
- Headache is an extremely common symptom in HIV infection, because of the frequency of intracranial infection and mass lesions. Saag, Gray Bill et al has described headache as a common symptom in HIV infection frequently
- Altered sensorium as observed in this study was primarily due to a meningeal infection, tuberculous meningitis being most frequent,
- In our study, the common cause for seizures was neurotuberculosis
- Sanfransisco data revealed altered sensorium as a manifestation in secondary viral infection

Conclusion

- 1) Incidence of neurological illness in HIV infection in our study was 31%.
- 2) All patients in our study had heterosexual transmission of disease
- 3) CNS manifestations in men were more common than in women.
- 4) Headache and altered mentation were the two common symptoms observed in this study.

- 5) Tuberculous meningitis was the most commonest opportunistic infection in our study.
- 6) No significant CD4 count correlation was found between the patients with neurological manifestations and those without neurological manifestations.
- 7) CD4 count when less was associated with increased mortality
- 8) Patients with coexisting tuberculous meningitis and HIV infection had significantly lower CD4 counts
- 9) Tuberculous meningitis was associated with good outcome and pyogenic meningitis had high mortality.
- 10) Patients with neurological manifestations had good outcome and low mortality.

References

1. A.I. Bhigjee MD, S. Madurai Msc, P.L.A. Bill FRCP, et al. Spectrum of myelopathies in HIV seropositive South African patients. *Neurology* 2001;57:348-351.
2. Mamidi A. Central Nervous system infections in individuals with HIV-1 infection. *J. Neurovirol.* 2002 Jun;8(3) : 158-67.
3. Bandyopadhyay D, Sarkar RN, Mandal SK, Bandyopadhyay R. Neurological manifestations of HIV/AIDS. *JAPI* 2005;53:379.
4. Vijay Teja, Vidhya Gulkarni. Spectrum of Neurological Manifestations of HIV/AIDS. *Journal of Neurology* 2005
5. Sokolska V. The Role of brain magnetic resonance studies in the diagnostics of central nervous system lesions in HIV – 1 positive patients. *Wiad Lek.* 2006;59(11-12) : 805-13 : Polish
6. Offiah CE. The imaging appearances of intracranial CNS infections in adult HIV and AIDS patients. *Clin Radiol.* 2006 May; 61(5) : 393-401.
7. Goodkin K, Wilkie FL. Aging and neuro-AIDS conditions and the changing spectrum of HIV-1-associated morbidity and mortality. *J Clin Epidemiol.* 2001.

8. Levy RM, Bredesen DE. Central Nervous System dysfunction in acquired immunodeficiency syndrome. *J Acquir Immune Defic Syndr.* 1998 ; 1(1) : 41-64.
9. Peters M. Meningovascular neurosyphilis in human immunodeficiency virus infection as a differential diagnosis of focal CNS lesions : a clinicopathological study. *J Infect.* 1993 Jul; 27(1) : 57-62.
10. Martinez. The neuropathology and epidemiology of AIDS. A Berlin experience. A review of 200 cases. *Pathol Res Pract.* 1995 Jun; 191(5) : 427-43.