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Neurological Manifestations in the Patients with HIV/AIDS

Authors
Dr Murugesh Pastapur[1], Dr Maitrey Patel[2], Dr Rajiv S Konin[3]
[1]Associate Professor, Department of General Medicine, MRMC, Kalaburgi
[2,3] PG Department of General Medicine MRMC, Kalaburgi
Department of General Medicine, Mahadevappa Rampure Medical College, Kalaburgi, Karnataka, India
Corresponding Author
Dr Maitrey Patel
11 Avi Bunglows, Opp Star Bazaar, Satellite Road, Ahmadabad 380015
Email: *ptlmaitrey@gmail.com, M – 7760378269*

Abstract
Background: *HIV/ AIDS has posed many unprecedented challenges. It causes a wide spectrum of disease manifestations. Neurological diseases is the first manifestation of symptomatic HIV infection in roughly 10-20% of patients, while about 60% of patients with advanced HIV disease will have clinically evident neurological dysfunction during the course of their illness.*
Objectives: *To study the neurological manifestations in patients with HIV/AIDS admitted to MRMC, Gulbarga and to note differences with various other studies carried out in India and in western countries and to evaluate simpler and cost effective diagnostic techniques.*
Methods: *A total of 50 patients admitted in medicine wards in Basaveshwar Teaching & General Hospital attached to M.R. Medical College, Gulbarga during a study period between November 2009 and September 2011, who were found to have HIV infection and history suggestive of nervous system manifestations were enrolled in the study.*
Results: *Of the total 50 patients, 33 were males and 17 were females with M:F ratio of 1.95:1. 88% of patients were between age group of 18-45 years. Meningitis was the most common neurological presentation (58%), comprising 16 patients with tubercular meningitis (32%), 7 patients with cryptococcal meningitis (14%), 5 patients with aseptic meningitis (10%), and 1 patient with bacterial meningitis (2%).*
Fever (66%), headache (64%), altered sensorium (38%) and convulsions (34%) were the commonest neurological symptoms. Tuberculosis was the commonest disease affecting CNS (38%), with 16 patients having meningitis (32%) and 3 patients having tuberculoma (6%). The most common space occupying lesions was toxoplasmosis (10%).
Conclusion: *There is high incidence of neurological manifestations affecting mainly economically reproductive age group (18-45 years) with tuberculosis and cryptococci being the most commonest pathogenic agents in course of HIV infections in this study.*
Keywords: *Human immunodeficiency virus; Tubercular meningitis; Cryptococcus meningitis; Toxoplasmosis.*

Introduction

At the end of 2013, an estimated 35.0 million individuals were living with HIV infection, according to the Joint United Nations Programme on HIV/AIDS (UNAIDS). HIV/ AIDS has generated so much concern because of rapid

dissemination, long incubation period, specific health problem, fatal outcome and great socioeconomic impact.HIV/ AIDS cause a wide spectrum of diseases and manifestations. Up to 70% of HIV patients develop neurological complications. It is not surprising that neurological complications of HIV infections are common and not confined to opportunistic infections. All levels of the neuraxis can be involved, including the brain, meninges, spinal cord, nerve and muscle. Neurological disease is the first manifestation of symptomatic HIV infection in roughly 10-20% of persons, while about 60% of patients with advanced HIV disease will have clinically evident neurological dysfunction during the course of their illness[1-3].

Hence, recognition and early diagnosis of these disorders is crucial because institution of therapy may dramatically change patients quality of life and survival time.

Material and Method

Randomly 50 patients with HIV positive and history suggestive of Nervous system manifestation from November 2009 to September 2011 admitted in Basaveshwar hospital and General Hospital attached to Mahadevappa Rampure Medical College, Gulbarga were selected as study sample. Confirmation of HIV status was done as per the guidelines given by WHO/ NACO. Total 50 number of cases were randomly selected.

Inclusion criteria

All patients with neurological manifestations and diagnosed to be HIV seropositive in age 15-65.

Exclusion criteria

HIV patients with diabetes mellitus , Collagen vascular disease ,HTN ,Vasculitis , Paraneoplastic syndrome

Method of Data Collection

Data was collected in a pretested proforma by meeting the objective of the study. A detailed history, physical findings with thorough neurological examination and necessary investigations were recorded. Treatment and outcome were not included in this study.

Investigations were done-TRIDOT (Rapid Visual Test), ELISA, CD4 count, CSF analysis, CT scan/ MRI (wherever required) , Serology to detect antibody to toxoplasma and CMV, cryptococcal antigen test ,Chest X-ray.

Results

Table-1: Age and sex distribution

Age of patient (years)	No. of patients	Percentage	Males		Female	
			Number	Percent	Number	Percent
18 – 25	8	16.00	5	10.00	3	6.00
26 – 35	17	34.00	11	22.00	6	12.00
36 – 45	19	38.00	13	26.00	6	12.00
46 – 65	6	12.00	4	8.00	2	4.00
Total	**50**	**100.00**	**33**	**66.00**	**17**	**34.00**

From the above table, it can be observed that male constitute 33 cases (66%), while females constituted 17 (34%) with male-female ratio of 1.95:1. The mean age among males was 35.3 years and in female it was 35.5 years. In this observation, 88% of patients were between 18-45 years of age. There were 84% cases, who were married. Among these 84%, males constituted 52% and females 32%. Only 8 patients were unmarried.

Neurological manifestations heralded the onset of HIV in 60% of the cases.40% of the cases were diagnosed to have HIV prior to admission. 98% patients had contracted the disease sexually. Most

of them had the history of multiple exposure i.e., heterosexual behaviour. One (01) person contracted HIV through injection drug use. No patient had any history of transmission through blood transfusion.

Table-2: Neurological signs and symptoms

Route	No. of patients	Percentage %	CNS signs	No. of patients	Percentage%
Headache	32	64.00	HMF	19	38.00
Fever	33	66.00	Cranial nerve	3	6.00
Altered sensorium	19	38.00	Abnormal fundus	14	28.00
Convulsions	17	34.00	Motor system	9	18.00
Weakness of limbs	9	18.00	Sensory system	3	6.00
Sensory deficits	4	8.00	Cerebellar signs	1	2.00
B/B disturbance	4	8.00	Gait	3	6.00
Giddiness	2	4.00	Meningeal signs	23	46.00

Out of 50 patients, most common presenting symptom is fever in 33 patients (66%), followed by headache in 32 patients (64%), altered sensorium 38% and convulsions in 34% of cases.

Out of 50 patients, 32 patients had CD_4 count in between 51-200 (64%), and 16 patients had CD_4 count between 201-500 (32%) and 2 patients had CD_4 count less than 50 (4%).

Table 3: - CSF Analysis in meningitis

CSF Analysis(mean/µl)	Cryptococcus	Tuberculos	Aseptic	bacterial
Cell	79	294	85	900
Protien	84	180	112	350
Sugar	46	38.5	46	29

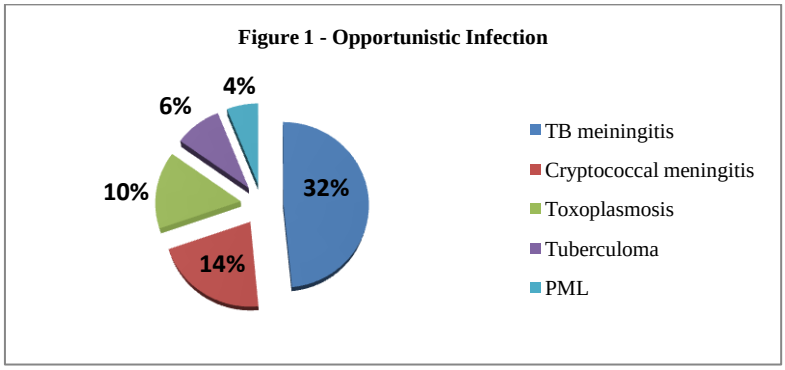

Figure 1 shows, Out of 50 patients, most common opportunistic infection is tubercular meningitis (32%), followed by cryptococcal meningitis (14%), toxoplasmosis (10%), tuberculoma (6%) and progressive multifocal leukoencephalopathy (4%).

Table-4: - Mean CD_{4+} T cell count of patients with different neurological diseases

Disease	No. of patients	Percent	CD_{4+} T range (cells/ μL)	Mean CD_{4+} T count (cells/ μL)
TBM	16	32.00	86 – 300	193
Toxoplosmosis	5	10.00	58 – 150	104
Tuberculoma	3	6.00	154 – 271	212
Cryptococcal meningitis	7	14.00	15 – 235	125
PML	2	4.00	40 – 68	54
Aseptic meningitis	5	10.00	86 – 270	178
Bacterial meningitis	1	2.00	160	160
Transverse myelitis	2	4.00	56 – 127	91
AIDP	4	8.00	120 – 300	210
HIV encephalopathy	2	4.00	60 – 104	82
Idiopathic epilepsy	2	4.00	350 – 400	375
Myopathy	1	2.00	350	350

Discussion

The age ranged from 18 to 65 years. Mean age was 35 years (M-35: F-36) with M: F ratio is 1.95:1. Satya et al[4] in his study observed male to female ratio of 3.7:1. Fragoso et al[5] in his study observed male to female ratio of 1.94:1. In this present study, the most common route of transmission was heterosexual (98%). This finding correlated with Sourab et al[6] (89.26%) and Deshpande et al[7] (92.5%) in which most common route of transmission was heterosexual. This is in contrast to the western studies where homosexual transmission is more common.

Table-5: Comparison of Neurological symptoms and signs with other studies

Symptoms and signs	Satya et al[4] (n=57)	Bolokadze et al[7] (n=76)	Present study (n=50)
Headache	40 (70%)	69 (91%)	32 (64%)
Fever	42 (73.6%)	57 (75%)	33 (66%)
Altered sensorium	18 (31.5%)	--	19 (38%)
Focal neurological deficits	13 (22.8%)	46 (61%)	9 (18%)
Seizures	26 (45%)	12 (15%)	17 (34%)
Meningeal signs	40 (70%)	--	23 (46%)
Papilloedema	20 (35%)	--	14 (28%)

Most of the patients presented with headache (64%) and fever (66%) as the most common complaint. This is also seen in the studies conducted by the Satya et al[4] (70% and 73% respectively) and Bolokadze et al[9] (91% and 75% respectively). But the meningeal signs are commonly seen in Satya et al[4] study when compared to the present study as per table 5.

Table 6 :- Comparison of opportunistic infections with other studies

Opportunistic infection	Satya et al[4](n=57)	Deshpande et al[7] (n=300)	Present study (n=50)
Tubercular meningitis	25 (43.8%)	24 (8%)	16 (32%)
Toxoplasmosis	5 (8.7%)	61 (20.3%)	5 (10%)
Cryptococcal meningitis	16 (28.1%)	51 (17.0%)	7 (14%)
Tuberculoma	1 (1.75%)	48 (16%)	3 (6%)
Progressive multifocal leucoencephalopathy	3 (5.26%)	20 (6.6%)	2 (4%)

Table 6 shows , the most common opportunistic infection in the present study is tubercular meningitis (32%) followed cryptococcal meningitis (14%). This is also seen in the study conducted by Satya et al[4], where the most common opportunistic infection is tubercular meningitis (43.8%) followed by cryptococcal meningitis (28.1%).In Deshpande et al[7] study, toxoplosmosis is more common opportunistic infection, but the sample is very huge when compared to the present study.In this study 2 cases (4%) of PML was diagnosed, Satya et al[4] reported 5.26% of their patients having PML. Levy et al[8] reported 2% of their patients having PML.

Table-7: Comparison of mean CD_4 count with other studies

Opportunistic infection	Satya et al[4] (n=57)	Deshpande et al[7](n=300)	Present study (n=50)
Tubercular meningitis	190 (25)	160 (24)	193 (16)
Toxoplosmosis	115 (5)	150 (61)	104 (5)
Cryptococcal meningitis	135 (16)	114 (51)	125 (7)
Progressive multifocal leukoencephalopathy	104 (3)	108 (20)	54 (2)
AIDP	--	395 (4)	210 (4)
Tuberculoma	--	212 (48)	212 (3)

Table 7 shows In almost all of the diseases, the mean CD_4 count are well correlated with the studies conducted by Satya et al[4] and Deshpande et al[7] except AIDP. In Deshpande et al7 study, the mean CD_4 count in AIDP is 395 cells/μL, when compared to the present study (210 cells/μL). According to DM Simpson et al[10], the condition generally occurs early in the course of HIV disease and may be the initial clinical disorder when seroconversion occurs. When AIDP occurs late in the course of HIV disease, in association with a low CD_4 count, cytomegalovirus may be the primary etiologic agent. So in this scenario CMV may be the etiological agent, which is causing AIDP in the present study, which is unable to diagnose in our set up.

Conclusion

Neurological manifestations in HIV/ AIDS are frequent complications which may affect every level of the nervous system. In the present study, 60% of the patients presented with neurological pathology and were diagnosed to have HIV/ AIDS thereafter. Most common affected age group ranged from 18-45 years with male:female ratio of 1.95:1. This indicate the high prevalence of HIV in economically reproductive age group. Meningitis was the most common neurological presentation in HIV infection in this study i.e., 58%.Tuberculosis is the commonest disease affecting CNS (38%).Headache and fever were the commonest symptoms in HIV patients with neurological pathology. Most common space occupying lesion in the CNS is toxoplosmosis (10%).Most number of patients (64%) are seen in the CD_4 range in between 51-200 cells/ μL.CSF analysis was done in most of the cases and was useful in diagnosing cryptococcal meningitis and providing clue to tubercular pathology.

Limitation

This is a small study carried out over stipulated period of time in a small population and does not indicate the true incidence of prevalence of the disease in the community.

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