NEUROLOGICAL MANIFESTATIONS IN HIV PATIENTS- A HOSPITAL-BASED STUDY OF JAWAHARLAL NEHRU INSTITUTE OF MEDICAL SCIENCES (JNIMS), IMPHAL, MANIPUR

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ABSTRACT

BACKGROUND

The nervous system is the most frequent and serious target of Human Immunodeficiency Virus (HIV) infection. All the levels of neuroaxis can be involved including the brain, meninges, spinal cord and peripheral nerve.

Aims and Objective- Despite the high prevalence of the disease in our state Manipur, very limited study has been done to evaluate the neurological aspects of HIV/AIDS from this part of India. This study is done to characterise various neurological manifestations of HIV/AIDS.

Setting and Design- This cross-sectional observational study was done over a period of 2 years from January 2014 to December 2015 at Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Manipur.

MATERIALS AND METHODS

A total of 142 HIV positive patients of both genders, age > 18 years, who were admitted in hospital due to HIV related symptoms were examined for the presence of neurological dysfunction. A detailed history, physical examination and relevant investigations were carried out.

RESULTS

Out of the 142 patients, 45 were found to have neurological involvement (31.7%). Out of the 45 patients, 26 patients were male (57.8%) compared to 19 female (42.2%). Majority of patients were between 30 - 40 years of age. Tuberculous meningitis was the most common illness (35.6%) followed by cryptococcal meningitis (20%). Distal Sensory Polyneuropathy (DSPN) was the most common primary illness (13.3%). Fever (55.6%) and headache (53.3%) were the most common symptoms.

CONCLUSION

We found a high prevalence of neurological manifestation (31.7%) in this setting. Secondary opportunistic infection were more common than the primary CNS disease.

KEYWORDS

HIV, AIDS, Tuberculous, Cryptococcal, Polyneuropathy, Meningitis, Opportunistic.

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BACKGROUND

HIV is a neurotropic virus, which can produce a large variety of neurological manifestations affecting all levels of the neuroaxis. Clinical disease of the nervous system accounts for a significant degree of morbidity and mortality in a high percentage of patients with HIV infection. At least 40% of HIV infected patients develop neurological symptoms during the course of their illness. In roughly 10% - 20% of person they are the first manifestation of HIV infection, while 60% of patients with advanced disease will have clinical evidence of neurological dysfunction.^{1,2,3} The incidence of subclinical neurological disease is even higher- Autopsy studies of patients with advanced HIV disease have demonstrated pathological abnormalities of nervous system in 70% - 90%

of cases with an average of 80%.^{4,5,6} The neurological problems in HIV may be either primary to the pathogenic process of HIV infection or secondary to opportunistic infections or neoplasm. Virtually all patients with HIV infection have some degree of nervous system involvement with the virus at some point of time. This is evidenced by the fact that CSF findings are abnormal in about 90% patients even during the asymptomatic phase of HIV infection. Although, an ongoing decline in HIV associated CNS disease has been observed in very recent years, the mortality from these disease remains high⁷ and thus emphasising the need for early detection and treatment of these problems. Manipur, despite being a high prevalence state of HIV and with its limited resource, there is limited data regarding neurological manifestations in HIV from this part of India. Thus, the aim of this present study is to highlight the different neurological complications among HIV/AIDS patients.

MATERIALS AND METHODS

This cross-sectional observational study was done over a period of 2 years from January 2014 to December 2015 at Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal, which is the second largest referral hospital in Manipur. A total of 142 HIV seropositive patients of both

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genders above 18 years of age, who were admitted in hospital with HIV related symptoms were evaluated thoroughly for the presence of any neurological disorder. A detailed history was taken and a meticulous physical examination was carried out with special emphasis on nervous system. Routine blood examinations including complete blood count, liver and kidney function test, CSF examination (cytology, protein, ADA, Ziehl-Neelsen staining, Indian Ink staining, Cryptococcal antigen, Fungal culture), Serum antigen for cryptococcus, serum immunoglobulin (IgM, IgG) for Toxoplasmosis, VDRL for Syphilis and Mantoux test were performed along with chest x-ray, CT/MRI of brain or spinal cord and funduscopy examination. Nerve Conduction Velocity (NCV) and Electromyography (EMG) test was performed to demonstrate the presence of neuropathy. The data thus obtained were analysed using mean and percentage.

RESULTS

Out of total 142 HIV patients admitted in hospital, 45 patients were found to have involvement of nervous system (31.7%).

Sex and Age Distribution

Out of the 45 patients with neurological illness, there were 26 (57.8%) male and 19 (42.2%) female patients. Male-to-female ratio was 1.3:1.

In our study, the minimum age of patient was 26 years and maximum was 52 years. The maximum number of patients were in 30 - 40 years of age group with 25 patients (55.6%) followed by 40 - 50 years of age group with 13 patients (28.9%) and 5 patients in 20 - 30 years of age group (11.1%). The least numbers of cases were seen in above 50 years of age group with only 2 patients (4.4%). The mean age of patients was 37.8.

Sex	Number of Patients	Percentage
Male	26	57.8%
Female	19	42.2%
AGE		
20 - 30	5 (M = 3, F = 2)	11.1%
30 - 40	25 (M = 16, F = 9)	55.6%
40 - 50	13 (M = 6, F = 7)	28.9%
> 50	2 (M = 1, F = 1)	4.4%

Table 1. Age and Sex Distribution (n = 45)

M- Male, F- Female

Disease Spectrum

Out of 45 patients with neurological disorder, 16 patients (35.6%) had tuberculous meningitis and out of these 16 patients 4 patients also had intracranial tuberculoma.

Cryptococcal meningitis was present in 9 patients (20%) and cerebral toxoplasmosis in 6 patients (13.3%). HIV Distal Sensory Peripheral Neuropathy (DSPN) was the most common.

Primary neurological disease with 6 patients (13.3%) having it followed by stroke with 4 patients (8.9%) and CIDP with 3 patients (6.7%); 1 patient (2.2%) had lymphoma of brain.

Types of Disease	No. of Patients	Percentage
Tuberculous Meningitis (TBM)	16	35.6%
Cryptococcal Meningitis (CCM)	9	20%
Cerebral Toxoplasmosis (TOXO)	6	13.3%
Distal Sensory Polyneuropathy (DSPN)	6	13.3%
Stroke	4	8.9%
Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)	3	6.7%
CNS Lymphoma	1	2.2%

Table 2. Types of Neurological Manifestation among 45 Patients (n = 45)

Clinical Presentation

Out of 45 patients who had neurological disorder, fever was the most common presenting symptom which was present in 25 patients (55.6%). Headache was seen in 24 patients (53.3%), while 12 patients (26.6%) presented with convulsion. Altered level of consciousness was seen in 13 patients (28.9%), focal weakness was seen in 9 patients (20%) and tingling and numbness was present in 7 patients (15.6%). Papilloedema was seen in 8 patients (17.8%), while 2 patients (4.4%) out of the 4 patients of stroke presented with slurring of speech.

Symptoms	Total No. of Cases	Percentage
Fever	25	55.6%
Headache	24	53.3%
Convulsion	12	26.6%
Focal Weakness	9	20%
Tingling Numbness	7	15.6%
Altered Consciousness	13	28.9%
Papilloedema	8	17.8%
Slurred Speech	2	4.4%

Table 3. Types of different Symptoms and Signs among 45 Patients (n = 45)

Neurological Disorders	Fever	Headache	Convulsion	Focal Weakness	Altered Consciousness	Tingling Numbness	Papilloedema	Slurred Speech
TBM (n = 16)	14 (87%)	11 (68.7%)	3 (18.8%)	2 (12.5%)	7 (43.7%)	0	4 (25%)	0
CCM (n = 9)	6 (66.7%)	6 (66.7%)	3 (33%)	0	3 (33%)	0	1 (11%)	0
TOXO (n = 6)	4 (66.7%)	5 (83.3%)	5 (83.3%)	0	2 (33%)	0	2 (33%)	0
STROKE (n = 4)	0	1 (25%)	0	4 (100%)	1 (25%)	1 (25%)	0	2 (50%)
DSPN (n = 6)	0	0	0	0	0	6	0	0
CIDP (n = 3)	0	0	0	3 (100%)	0	0	0	0
CNS Lymphoma (n = 1)	1 (100%)	1 (100%)	1 (100%)	0	0	0	1 (100%)	0

Table 4

DISCUSSION

The incidence of Human Immunodeficiency Virus (HIV) is increasing in India and central nervous system involvement are seen more frequently.⁸ In our study, the prevalence of neurological involvement among HIV patient was 31.7%. This finding is comparable with the study of Vijay D. Teja et al⁹ and Patil and Patil¹⁰ who found a prevalence of neurological disorder of 26.6% and 42.5%, respectively. In this study out of 45 patients, number of male was 26 (57.8%) and that of female was 19 (42.2%). The M: F ratio was 1.3:1.

The mean age in our setting was 37.8 with maximum number of cases (25 cases, 55.6%) within age group 30 - 40. Again our finding is comparable with the study of Jowi et al,¹¹ who found a male predominance over female (57.35 vs 42.7%) with M: F ratio of 1.3:1 and a mean age of 38.84. In the present study, the incidence of neurological involvement was found to be maximum in age group 20 - 40 years (66.7%), which correlates with a study done by Sircar AR et al¹² in which maximum incidence was seen in age group 20 - 40 years (77.9%). They are the most sexually active age group in our society.

In this study, secondary neurological complication was found in 32 cases (71.1%) and primary illness was found in 13 cases (28.9%). This is similar to the findings of other studies by Shripad R Kausadikar et al,¹³ MD Solu et al¹⁴ and Himanshu M Rana.¹⁵ In our study tuberculous meningitis was the most common infection with 16 patients (35.6%), out of which 4 patients also had intracranial tuberculoma. Next common infections was cryptococcal meningitis in 9 patients (20%) and toxoplasmosis in 6 patients (13.3%). This finding is in concordance with many other studies. In a study from NEIGRIHMS, Shillong, Shri Ram Sharma et al¹⁶ found Tuberculous meningitis (43.95%) to be more common than cryptococcal meningitis (14.2%) followed by toxoplasmosis (2.19%). Similarly, Himanshu M Rana et al¹⁵ found tuberculous meningitis (34%) more common than Cryptococcal meningitis (14%) and cerebral toxoplasmosis (10%). Attili Venkata Satya et al¹⁷ also found the same pattern. In our study, Toxoplasmosis (13.3%) was most common focal brain lesion followed by intracranial tuberculoma (8.8%). This was similar to the findings from NIMS by Vijay D Teja et al.⁹

HIV patients are at increased risk for cerebrovascular disease. In the present study, we found 4 (8.9%) patients with acute stroke due to cerebral infarction. This is comparable to the finding by Patil and Patil, where ischaemic stroke was seen in 9.87%.¹⁰ Shri Ram Sharma et al also found an incidence of 5.49% of CVA in their study.¹⁶ In our study DSPN (13.3%) was the most common primary neurological illness followed by CIDP (6.7%), which is comparable with the study from NIMS⁸ in which DSPN (3.13%) was more common than CIDP (1.83%). In our study, we found only 1 patient (2.2%) with CNS lymphoma, which can be compared with other study.¹⁸ The diagnosis of lymphoma was based on CT/MRI of brain, as biopsy of the lesion was not possible in our setup.

In the present study fever (55.6%), headache (53.3%), altered consciousness (28.9%) and seizure (26.6%) were the most common presenting symptom at the time of admission. This is similar with the findings of MD Solu et al¹⁴ who found fever (64%), headache (56%), altered consciousness (52%) and convulsion (32%) to be the most common symptoms in their study. Himanshu M Rana et al¹⁵ also found fever as the

most common symptoms (88%) followed by headache (82%), altered consciousness (64%) and convulsion (35%). In this study fever, headache, altered consciousness were the most common symptoms in TBM and Cryptococcal meningitis, while convulsion and headache were the most common symptoms of Cerebral Toxoplasmosis. Among 45 cases we studied, 9 patients had focal neurological deficit. Among these 2 (22.2%) had TBM with 4 (44.5%) had stroke and 3 patients (33.3%) had CIDP.

CONCLUSION

We found a high prevalence of neurological complications among the HIV patient. Prevalence of neurological manifestation was highest in young adult with male predominance. The opportunistic infections remain the leading cause of neurological involvement in HIV. Fever was the most common presenting symptom. High index of suspicion of neurological involvement in HIV patients at all stage helped in early diagnosis and hence timely initiation of specific therapy may considerably reduce the morbidity and mortality due to the disease.

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