

ORIGINAL ARTICLE

DIFFERENTIAL DIAGNOSIS OF HIV POSITIVE PATIENTS WITH NEUROLOGICAL MANIFESTATIONS

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ABSTRACT

Introduction: The nervous system is among the most frequent and serious target of HIV infection and is most frequently occur in patient with profound immunosuppression. 40 to 70 percent persons with HIV have neurological disorder. In 10 to 20 percent it is AIDS defining illness. It has higher mortality than other infections. Considering these facts the current study was designed to check the differential diagnosis of various neurological manifestations in HIV patients.

Methodology: All HIV positive patients above 18 years presenting with neurological manifestations and ready to give informed written consent to participate in the study were included in the study. Detailed clinical history with special emphasis on consciousness, convulsions and headache was taken. Thorough clinical examination included mental status examination including MMSE, sensory, motor and cranial nerves examination.

Results: The present study comprises 50 HIV infected patients with neurological manifestation presenting at the hospital. There were total 15 (30%) patients diagnosed with primary neurological illness. Most of the patients were having DSPN as primary neurological illness. ADC is one of the common neurological manifestations. 4% of our patients had ADC which is diagnosed by MMSE (mini mental status examination) score. Out of total 50 patients, 35 (60%) patients were diagnosed as Secondary Neurological Illness. Out of these, TBM was the most common illness, Other common secondary illnesses were Cryptococcal Meningitis (16%), Toxoplasmosis (10%) and PML (8%).

Conclusion: Tubercular Meningitis and Distal sensory polyneuropathy were the most common cause of neurological manifestation among HIV positive patients.

Keywords: HIV, Distal sensory polyneuropathy, TB Meningitis, AIDS dementia complex, Cryptococcal Meningitis

INTRODUCTION

Acquired immunodeficiency Syndrome (AIDS) is caused by Human Immunodeficiency virus (HIV). It is a serious disorder of immune system in which normal defense of body breaks against infection leading to life threatening conditions. Since the first detection of acquired immunodeficiency syndrome (AIDS) cases in summer of 1981 among Homosexuals in USA, the number of Human Immunodeficiency Virus (HIV) positive individuals and AIDS cases has increased explosively.¹

The nervous system is among the most frequent and serious target of HIV infection and is most frequently occur in patient with profound immunosuppression.¹ 40 to 70 percent persons with HIV have neurological disorder. In 10 to 20 percent it is AIDS defining illness.² It has higher mortality than other infections. It has also higher morbidity. Neurological

problems that occur in HIV infected individual may be either primary to pathological process of HIV infection or secondary to opportunistic infections or neoplasms.¹ It may be inflammatory, demyelinating or degenerative in nature.

In assessment of neurological symptoms, it should be kept in mind that multiple HIV associated disorders may coexists in a patient simultaneously.² even in absences of specific complains careful neurological examination frequently reveals evidence of CNS or PNS dysfunction. Although extensive studies on HIV and AIDS have been done in west, there is pressing need for elaborate studies in India owing to the differences in social economic, cultural and education background.

Considering these facts the current study was designed to check the differential diagnosis of various neurological manifestations in HIV patients.

METHODOLOGY

This was a cross sectional study among HIV patients attending medicine OPD and admitted patients in SMIMER, a tertiary care hospital in Surat, Gujarat.

All HIV positive patients above 18 years presenting with neurological manifestations and ready to give informed written consent to participate in the study were included in the study.

Permission of Institutional Ethical Committee was obtained before conducting study. There were total 50 HIV infected patients showing clinical evidence of nervous system involvement were ready to consent and included in the study.

Detailed clinical history with special emphasis on consciousness, convulsions and headache was taken. Thorough clinical examination included mental status examination including MMSE, sensory, motor and cranial nerves examination.

Apart from routine investigations, CD4 count was measured using standard flow cytometry. Diagnostic investigations like MRI brain with contrast, cerebrospinal fluid (CSF) examination and electromyography-nerve conduction study (EMG-NCS) were done as and when required.

RESULTS

The present study comprises 50 HIV infected patients with neurological manifestation presenting at the hospital. Following observations were noted during this study.

Table 1: Age distribution of study subjects (n=50)

Age (in Years)	No. (%)
18-20	3 (6)
21-40	39 (78)
>41	8 (16)

Table 2: Primary neurological illness (n=50)

Primary neurological illness	No. (%)
DSPN (Distal sensory polyneuropathy)	11 (22)
ADC (AIDS dementia complex)	2 (4)
AIDP (acute inflammatory demyelinating polyneuropathy)	2 (4)

Table 3: Secondary neurological illness (n=50)

Secondary Neurological Illness	No. (%)
TBM (TB meningitis)	18 (36)
Cryptococcal Meningitis	8 (16)
Toxoplasmosis	5 (10)
PML (Progressive Multifocal Leukoencephalopathy)	4 (8)

Maximum number of patients (79%) were from age group of 21 to 40 years. 8 (16%) patients were above the age of 41 years. Among study subjects, 37 (74%) were male and 13 (26%) were female.

There were total 15 (30%) patients diagnosed with primary neurological illness. Most of the patients were having DSPN as primary neurological illness. ADC is one of the common neurological manifestations. 4% of our patients had ADC which is diagnosed by MMSE (mini mental status examination) score which included questions for assessment of orientation, memory, attention and concentration ability, recall, language, etc.

Out of total 50 patients, 35 (60%) patients were diagnosed as Secondary Neurological Illness. Out of these, TBM was the most common illness, Other common secondary illnesses were Cryptococcal Meningitis (16%), Toxoplasmosis (10%) and PML (8%).

DISCUSSION

HIV-infected individuals can experience a variety of neurological abnormalities due either to opportunistic infections and neoplasm or to direct effects of HIV or its products. With regard to the latter, HIV has been demonstrated in the brain and CSF of infected individuals with and without neuropsychiatry abnormalities. The main cell types that are infected in the brain in vivo are those of the monocyte/macrophage lineage, including monocytes that have migrated to the brain from the peripheral blood as well as resident microglial cells. HIV entry into brain is felt to be due, at least in part, to the ability of virus infected and immuneactivated macrophages to induce adhesion molecules such as Eselectin and vascular cell adhesion molecule-1 (VCAM-1) on brain endothelium.

HIV-infected individuals may manifest white matter lesions as well as neuronal loss. Given the relative absence of evidence of HIV infection of neurons either in vivo or in vitro, it is unlikely that direct infection of these cells accounts for their loss. Rather, the HIV-mediated effects on brain tissue are thought to be due to a combination of direct effects, either toxic or function-inhibitory of gp120 on neuronal cells and effects of a variety of neurotoxins released from infiltrating monocytes, resident microglial cells, and astrocytes. In this regard, it has been demonstrated that both HIV-1 NEF and Tat can induce chemotaxis of leukocytes, including monocytes, into the CNS. Neurotoxins can be released from monocytes as a consequence of infection and/or immune activation. Monocyte-derived neurotoxic factors have been reported to kill neurons via the N-methyl-D-aspartate (NMDA) receptor. In addition, HIV gp120 shed by virus-infected monocytes could cause neurotoxicity

by antagonizing the function of vasoactive intestinal peptide (VIP), by elevating intracellular calcium levels, and by decreasing nerve growth factor levels in the cerebral cortex.

Clinical disease of the nervous system accounts for a significant degree of morbidity in a high percentage of patients with HIV infection. The neurologic problems that occur in HIV-infected individuals may be either primary to the pathogenic processes of HIV infection or secondary to opportunistic infections or neoplasms.¹ The likelihood that HIV or its products are involved in neuropathogenesis is supported by the observation that neuropsychiatric abnormalities may undergo remarkable and rapid improvement upon the initiation of antiretroviral therapy, particularly in HIV-infected children.¹

In our study the incidence of neurological involvement was found maximum (78%) in age group 21-40 years. This is closely related with A.R Sircar study³ in which maximum incidence (77.9%) was found in age group 21-40 years. This is the sexually active age group and hence increased prevalence of HIV and its neurological manifestation were found in this age group. This is a social danger as this is the most productive group of society so it is going to affect growth of nation and next generations also. So it is an issue of major concern for further prevention of disease.

There were 37 males (74%) and 13 female (26%) are affected in our study and Male: Female ratio was 2.9:1 comparable to study done by A.R. Sircar³ and AKD Study⁴ in which male: female ratio was 3.1:1 and 3:1 respectively. Male have high chances for HIV infection and its neurological manifestation

probably because of high risk sexual behavior than female.

DSPN was most common primary neurological illness. DSPN was found in 22% cases accounting most common primary HIV illness. ADC was found in 4% of cases and AIDP in 4% of cases. Our results are comparable with results of NIMS study.⁵

In our study Tuberculous meningitis was found in 36% of cases while in AKD study⁵⁶ it was 10%. Cryptococcal meningitis found in 16% in our study while in AKD study it was 21% which is comparable. TBM is most common secondary neurological illness. Overall TBM is most common neurological illness.

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