

PROFILE OF CASES OF INFECTIOUS MENINGITIS IN HIV PATIENTS

Yarram Rajeswara Rao¹, Gudi Srinivas²

¹Assistant Professor, Department of General Medicine, Rajiv Gandhi Institute of Medical Sciences, Ongole.

²Associate Professor, Department of General Medicine, Rajiv Gandhi Institute of Medical Sciences, Ongole.

ABSTRACT

BACKGROUND

Central nervous system (CNS) involvement is one of the common manifestations of acquired immunodeficiency syndrome (AIDS). About one-fifth of AIDS patients die of CNS diseases.

MATERIALS AND METHODS

A hospital-based cross-sectional descriptive study was conducted in Rajiv Gandhi Institute of Medical Sciences, Ongole. 50 HIV patients with clinical features suggestive of meningitis were selected for the study. A brief history and detailed investigations were carried out for the patients.

RESULTS

Out of the 50 study population, majority (56%, n= 28) belonged to 30 - 39 years' age group and majority (60%, n= 30) were females. Tuberculous meningitis was found to be the most common cause of meningitis in HIV patients. In the present study, 30 patients (60%) were found to have tuberculous meningitis and 5 patients (10%) were found to have cryptococcal meningitis. 46 patients had CD4+ T-cell count < 500/uL, among whom 18 patients had CD4+ T-cell count < 200/uL. All the patients with tuberculous meningitis and cryptococcal meningitis were found to have CD4 count < 500/uL.

CONCLUSION

Tuberculous meningitis was found to be the most common cause of meningitis in HIV patients.

KEYWORDS

Meningitis, HIV, AIDS, Tuberculous Meningitis, Cryptococcal Meningitis.

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BACKGROUND

AIDS is the most important pandemic of the 20th and early 21st centuries. It was first recognised in 1981 through a growing number of reports of rare opportunistic infections.

HIV infection is characterised by an acquired and usually profound depression of cell-mediated immunity. It is this failure of immune function that explains the development of a wide range of opportunistic infections and unusual neoplasms.^[1]

Virtually, all organ systems are vulnerable including all parts of the CNS, the peripheral nerves and roots and muscle. Moreover, the nervous system is susceptible to a number of unusual syndromes that are the direct result of the AIDS virus infection.^[2]

Central nervous system (CNS) involvement is one of the common manifestations of acquired immunodeficiency syndrome (AIDS). About one-fifth of AIDS patients die of CNS diseases. Tuberculosis, cryptococcosis, cytomegalovirus infection, human immunodeficiency virus (HIV) encephalopathy, lymphomas and toxoplasmosis are by far the commonest AIDS diagnostic diseases of the CNS.^[3]

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Corresponding Author:

Dr. Gudi Srinivas,

House No. 19/28/351,

Near Railway Station,

Clough Pet, 4th Lane,

Ongole-523001, Prakasam, Andhra Pradesh.

E-mail: drsrinivasgudi@gmail.com

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MATERIALS AND METHODS

Source of Data

Meningitis patients admitted in Rajiv Gandhi Institute of Medical Sciences, Ongole who are seropositive for HIV antibodies- 50 cases were selected by simple random sampling technique.

Selection Criteria

Inclusion Criteria

HIV patients with clinical features suggestive of meningitis were included in the study.

Study Site

Department of General Medicine, Rajiv Gandhi Institute of Medical Sciences, Ongole.

Study Type

Cross-sectional descriptive study.

Study Duration

From January 1st 2015 to December 2017.

Definitions

Meningitis: Inflammation of the meninges of the brain and the spinal cord, most often caused by a bacterial or viral infection and characterised by fever, vomiting, intense headache and stiff neck.

Clinical Features of Meningitis

Headache, Vomiting, Fever, Altered sensorium, Nuchal rigidity, Kernig's sign, Brudzinski's sign Papilloedema on fundoscopy, plantar extensor.

Investigations

All patients were investigated with the following:

1. Complete Haemogram.
2. ESR.
3. RBS.
4. Urine analysis.
5. HIV testing.
6. Fundus examination.
7. CSF analysis: Cell count, Cell type, Sugar, Protein, Chloride, ADA levels, Gram stain, AFB staining, Fungal stain, Cryptococcal antigen testing, Culture.
8. Chest x-ray- PA view.
9. Sputum AFB.
10. Smear for Malaria parasite.
11. CT brain.
12. CD4 count.

Diagnostic Criteria Followed

1. Diagnosis of tubercular meningitis was based on:
 - History of meningitis,
 - Cerebrospinal fluid (CSF) showing increased protein levels
 - Lymphocytic pleocytosis along with
 - Raised Adenosine deaminase levels
 - And presence of acid-fast tubercular bacilli (AFB)
2. Cryptococcal meningitis was diagnosed by:
 - India ink method, or culture demonstrating Cryptococcus or Cryptococcal antigen testing.

Statistical Analysis

Statistical analysis was done using Microsoft Excel 2010 version. Data was presented in percentages and proportions. Numerical data was expressed in mean and standard deviation.

RESULTS

Out of the 50 study population, majority (56%, n= 28) belonged to 30 - 39 years' age group with mean age being 37.5 ± 5.3 years. Sex distribution found that 30 (60%) were males and 20 (40%) were females.

Types of Meningitis	No. of Patients	Percentage
Tuberculous	30	60%
Cryptococcal	5	10%

Table 1. Prevalence of Cryptococcal and Tuberculous Meningitis in HIV Patients

Table 1 shows the prevalence of tuberculous meningitis and cryptococcal meningitis in our study group. Tuberculous meningitis was found to be the most common cause of meningitis in HIV patients. In present study, 30 patients (60%) were found to have tuberculous meningitis and 5 patients (10 %) were found to have cryptococcal meningitis.

Clinical Features

In this study, HIV patients with tuberculous meningitis had headache as the most common symptom (80%) followed by fever (73%). Most common sign was neck stiffness (100%).

Headache is the most common symptom, which is seen in 100% of patients of cryptococcal meningitis in the study

followed by fever and altered sensorium with neck stiffness as the most common sign.

Distribution of HIV patients with meningitis based on CD4+ T-cell count:

In present study 46 patients had CD4+ T-cell count <500/uL, among whom 18 patients had CD4+ T-cell count <200/uL.

All the patients with tuberculous meningitis and cryptococcal meningitis were found to have CD4 count <500/uL.

CSF	Mean Value
CSF Cell Count (Mean ± SD)	68 ± 34.20
Cell Type	Lymphocytes
Protein	84 ± 49.74
Sugar	40 ± 19.44
Fungal Stain	5 (100%) Positive
Cryptococcal Antigen	5 (100%) Positive

Table 2. CSF Findings in Cryptococcal Meningitis

In the present study, in HIV patients with cryptococcal meningitis the CSF cell count varied from 40 - 110. Mean CSF cell count is 68 ± 34.20. All the patients had predominantly lymphocytes. Mean CSF protein in mg% is 84 ± 49.74. Mean CSF glucose in mg% is 40 ± 19.44. Fungal stain and cryptococcal antigen testing is positive in all cases (100%).

CSF	Mean Value
CSF Cell Count (Mean ± SD)	133 ± 94.28
Cell Type	Lymphocytes
Protein	264 ± 184
Sugar	38 ± 20.86
ADA Levels	19 ± 6.41
AFB Staining	10 (33%) Positive

Table 3. CSF Findings in Tuberculous Meningitis

In the present study in the HIV patients with tuberculous meningitis, the CSF cell count varied from 12 - 500. Mean CSF cell count was 133 ± 94.28. All the patients had predominantly lymphocytes. Mean CSF protein in mg% was 264 ± 184. Mean CSF glucose in mg% was 38 ± 20.86.

Mean ADA levels were 19 ± 6.41. AFB staining was positive in 33% of cases.

Mortality of HIV Patients with Meningitis

In the present study 6 patients died, out of which 4 patients had tuberculous meningitis and 2 patients had cryptococcal meningitis.

DISCUSSION

Tuberculosis is the commonest cause of meningitis in patients with AIDS in developing countries. Cryptococcal meningitis is the common type of meningitis in patients with AIDS in developed countries.

This study entitled "Profile of cases of infectious meningitis in HIV patients" was carried out at Rajiv Gandhi Institute of Medical Sciences, Ongole, during the period from January 1st, 2015 to December 2017.

Age

In the present study, the incidence of meningitis was maximum in age group 30 - 39 years (56%). 76% of patients were in the age group of 30 - 49 years. Sonkar et al^[4] found that majority were in the age group of 31 - 40 years (49%). Teja et al^[5] found that most patients were in the age group of 30 - 40 years.

Sex

In this study of 50 patients, it was observed that the majority of patients were males 60% in comparison to female population which was 40%. Sonkar et al^[4] and Teja et al^[5] found that majority were males.

Prevalence of Tuberculous and Cryptococcal Meningitis in HIV Patients

In this study of 50 patients, we found that tuberculous meningitis is more common in HIV patients with meningitis. In this study, 30 patients (60%) were found to have tuberculous meningitis and 5 patients (10%) were found to have cryptococcal meningitis.

Comparing present study with those of other investigators, we found that most investigators^[4,5,6,7,8,9] concur with our finding, i.e. tuberculous meningitis was more common than cryptococcal meningitis in HIV patients.

Clinical Features

In this study, HIV patients with tuberculous meningitis had headache as the most common symptom (80%) followed by fever (73%) and had neck stiffness as the most common sign (100%).

Headache is the most common symptom, which is seen in 100% of patients of cryptococcal meningitis in this study followed by fever and altered sensorium.

Wadhwa et al^[6] found that headache is the most common symptom followed by fever in meningitis in HIV patients. Sonkar et al^[4], Rana et al^[8] and Attili VS et al^[9] found that fever and headache are the most common symptoms.

Correlation between CD4+ T-cell Count and Aetiology of Meningitis

In this study, all the patients with tuberculous meningitis were found to have CD4 count < 500/uL. In this study, all the patients with cryptococcal meningitis had CD4 count < 200/uL. 43% of patients with tuberculous meningitis had CD4 count < 200/uL, but 100% of patients with cryptococcal meningitis had CD4 count < 200/uL.

Wadhwa et al^[6] found that cryptococcal meningitis occurred in patients with CD4 count < 200/uL. Sonkar et al^[4] found that 55% of patients with tubercular meningitis had

CD4 count less than 200, but in cryptococcal meningitis 83% patients had CD4 less than 100/uL. Rana et al^[8] found that cryptococcal meningitis patients had CD4 less than 100/uL.

CONCLUSION

The present study which has been done in a tertiary level hospital found that Tuberculous meningitis is the most common cause of meningitis in HIV patients followed by Cryptococcal meningitis. Lower CD4 count was found in all the patients with tuberculous and cryptococcal meningitis. Present study findings in Indian patients is similar to most studies.

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