ORIGINAL ARTICLE

Socio Demographic and Clinical Factors associated with TB Meningitis among HIV Positive Patients

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ABSTRACT

Introduction: Infection with HIV is associated with increased risk of activation of latent infection of Tuberculosis.. Furthermore, TB Meningitis have found that co-infection with HIV is associated with an increased risk of mortality. The present study was done with the objective of exploring socio demographic and clinical factors associated with TB Meningitis among HIV positive patients.

Methodology: The present study was done among Patients Living with HIV/AIDS (PLHA) admitted patients in medicine department. Records of all HIV positive patients diagnosed with TB meningitis during the study period of one year were obtained. Records of presenting symptoms, Socio-demographic variables, all laboratory investigations including CD4 count, past history of TB and outcome of past TB of these patients were recorded in separate case record sheet and evaluated further for the study.

Results: Maximum of patients (33.33%) were from age group of 31 to 40 years. Males were common among study participants. Previous history of Tuberculosis is important for the patients with TB meningitis in HIV patients. Mean CD 4 count in participants was 140 cells/µL. More than 70% patients of TBM had the CD4 count less than 200 cells/microL. Risk of TBM increased with CD4 count less than 200 cells/microL.

Conclusion: TB Meningitis is mostly affecting HIV patients from age group of 21 to 40 years. Males are commonly affected. Previous history of Tuberculosis is important for the patients with TB meningitis in HIV patients. For TB meningitis patients fever, headache and altered sensorium are common presenting symptom.

Key words: TB, Meningitis, HIV/AIDS, PLHA

INTRODUCTION

Meningitis is the most devastating manifestation of tuberculosis. The HIV-infected individual is at greater risk of developing TB Meningitis (TBM), particularly at a stage of more advanced immunesuppression. Furthermore, most observational studies of TBM have found that co-infection with HIV is associated with an increased risk of mortality. Infection with HIV is associated with increased risk of activation of latent infection, as well as increased risk of rapid progression of primary infection, without an intervening period of latency. Without HIV infection, individuals with latent infection have 10% -20% lifetime risk of developing tuberculosis.[1]

In contrast, the HIV-infected individual will carry a 10% annual risk of progression to active infection, with increasing risk as the CD4+ count declines.[2] Patients with HIV and active tuberculosis have an increased risk of extrapulmonary tuberculosis, and this risk will also increase with declining CD4+ count.[3]

This increased risk of extrapulmonary disease leads to an increased risk of meningitis.

As a consequence of the overlapping HIV and tuberculosis epidemics, in some populations tuberculosis has become the dominant cause of meningitis, more common than acute bacterial infections such as Neisseria meningitidis, Haemophilus influenzae, and Streptococcus pneumoniae.[4]

In a recent case series from the United States, 17% of patients with tuberculous meningitis (TBM) died during the first 9 months of therapy.[5] In countries with a high incidence of tuberculosis, the mortality rate may be greater than 50%,[6] and survivors may be left with significant neurologic disabilities. Diagnostic delays of TBM are also associated with increased risk of mortality.

Several observational studies comparing the clinical presentation of TBM in patients with and without HIV infection have found that presenting symptoms such as fever, headache, vomiting, and weight loss are similar in both groups.[7,8,9]

On examination, HIV-infected patients may be more likely to have lymphadenopathy and hepatosplenomegaly.[7,10] An altered level of consciousness may be more prominent in HIV-infected individuals. Among

patients with TBM in India, impaired cognition was exclusively seen in HIV-infected patients.[8]

The present study was done for exploring socio demographic and clinical factors associated with TB Meningitis among HIV positive patients.

METHODOLOGY

The present study was done among Patients Living with HIV/AIDS (PLHA) admitted patients in medicine department of Surat Municipal Institute of Medical Education and Research (SMIMER), a tertiary care hospital in Surat, Gujarat, India. Records of all HIV positive patients diagnosed with TB meningitis; admitted in medicine department of SMIMER during the study period of one year were obtained.

Prior permission of hospital authority was obtained to access the records and to conduct the study. Records of presenting symptoms, Socio-demographic variables, all laboratory investigations including CD4 count, past history of TB and outcome of past TB of these patients were recorded in separate case record sheet and evaluated further for the study. There were total 21 HIV positive patients diagnosed with TB meningitis were admitted during the study period. Out of these, records of 6 patients were excluded due to incompleteness. Thus finally total records of total 15 patients were included in the study.

Permission of Ethical Committee was Institute obtained before conducting study. Strict confidentiality of all data were maintained at all level of the study. Data was cleaned entered and analyzed in Microsoft Excel.

RESULTS

The present study was a record based study. The complete records of all total 18 HIV positive patients diagnosed with TB meningitis were obtained from the hospital.

Table 1 shows some of the important variables associated with TB meningitis in HIV patients. Maximum number of patients (33.33%) were from age group of 31 to 40 years. Around 72% of patients were from age group of 21 to 40 years. Males were common among study participants. Total 10 (55.56%) patients were residing in rural areas. Around 7 (38.89%) patients were single and 5 (27.78%) patients were currently married. Previous history of Tuberculosis is important for the patients with TB meningitis in HIV patients. 12 (66.67%) of study participants were having previous history of Tuberculosis. Out of these 12 patients, only 3 (25.0%) were properly treated and cured. Mean CD 4 count in study participants was 140 cells/microL. More than 70% patients of TBM had the CD4 count less than 200 cells/microL.

Table 1: Different variables associated with study participants

Variables	Cases (%)
Age (Years)	
<20	1 (5.56)
21-30	7 (38.89)
31-40	6 (33.33)
41-50	2 (11.11)
>50	2 (11.11)
Gender	
Male	13 (72.22)
Female	5 (27.78)
Residence	
Rural	10 (55.56)
Urban	8 (44.44)
Marital Status	
Single	7 (38.89)
Married	5 (27.78)
Divorced	2 (11.11)
Widow/Widower	4 (22.22)
Previous History of TB	
Yes	12 (66.67)
No	6 (33.33)
Outcome of Previous TB (n=12)	
Cured	3 (25.0)
Default	5 (41.67)
Treatment Continue	4 (33.33)
CD4 Level (cells/microL)	
0-50	4 (22.22)
51-100	3 (16.67)
101-150	3 (16.67)
151-200	2 (11.11)
201-250	3 (16.67)
>250	3 (16.67)

Table 2: Neurological manifestation of study participants (N=18) (Multiple responses)

Neurological manifestation	Cases (%)
Fever	17 (94.44)
Headache	16 (88.89)
Altered sensorium	14 (77.78)
Signs of meningeal irritation	13 (72.22)
Convulsion	6 (33.33)
Focal deficit	4 (22.22)

Multiple neurological presenting symptoms were present in patients. Out of total 18 patients, fever was present in 94% patients, headache was present in 88% of patients, altered sensorium was present in 77% of patients and signs of meningeal irritation was found in 72% patients. Altered sensorium is more in our study due to late presentation in hospital

DISCUSSION

Neurological TB, occurs in 5 to 8% in HIV infected patients; five times more frequent than in patients

without HIV. [11] TBM accounts for approximately 1% of all cases of TB.[12]

There were total 18 HIV positive patients diagnosed with TB meningitis during the study period and their records were obtained from the hospital.

Maximum number of patients were from age group of 31 to 40 years. Males were common among study participants. Previous history of Tuberculosis is important for the patients with TB meningitis in HIV patients. 12 (66.67%) of study participants were having previous history of Tuberculosis. Out of these 12 patients, only 3 (25.0%) were properly treated and cured. TBM occurs most often in persons over 45 years, frequently appearing as a reactivation of a latent infection.[13] This could be explained by the young age of our population and the high incidence of TB in our country. Mean CD 4 count in study participants was 140 cells/microL. More than 70% patients of TBM had the CD4 count less than 200 cells/microL.

Patients with HIV and active tuberculosis have an increased risk of extrapulmonary tuberculosis, and this risk will also increase with declining CD4+ count.[3] Clinical features were useful in orientating clinical suspicion towards CNS disease, though they usually were non-specific and not outstanding. In present study, fever, headache and altered sensorium were among the most common presenting symptoms.

Several observational studies comparing the clinical presentation of TBM in patients with and without HIV infection have found that presenting symptoms such as fever, headache, vomiting, and weight loss are similar in both groups.[7,8,9,10,14]

On examination, HIV-infected patients may be more likely to have lymphadenopathy[10] and hepatosplenomegaly.[7] An altered level of consciousness may be more prominent in HIV-infected individuals. Among patients with TBM in India, impaired cognition was exclusively seen in HIV- infected patients.[8] In contrast, studies of adults in Vietnam[14] and Spain[15] found no difference in rates of alerted mental status on presentation. In South Africa, HIV-uninfected children were more likely to have impaired consciousness on initial presentation.[7]

CONCLUSION

TB Meningitis is mostly affecting HIV patients from age group of 21 to 40 years. Males are commonly affected. Previous history of Tuberculosis is important for the patients with TB meningitis in HIV patients. For TB meningitis patients fever, headache and altered sensorium are common presenting symptom. Risk of TBM increased with CD4 count less than 200 cells/microL.

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