

Clinico-epidemiological Profile of HIV Patients with Respiratory infections and Tuberculosis in Western India

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ABSTRACT

In this study, 50 HIV seropositive patients who attended the Pulmonary Medicine Clinic of a tertiary care teaching institute in western India were enrolled. Of these, 39 were men and 13 were women. The mean age of the study subjects at the time of diagnosis was 34.96 years. Heterosexual contact was the commonest mode of transmission in 34 (68%) patients, followed by blood transfusion in 9(18%). A history which was suggestive of a risk factor for HIV transmission could not be elicited in 7

(14%) patients. Cough (96%), weight loss (96%), fever (88%), chronic diarrhoea (70%) and dyspnoea (52%) were the common presenting symptoms. Tuberculosis was the commonest respiratory infection (72%), followed by bacterial pneumonia (22%), pneumocystic jiroveci infection (6%) and fungal infection (4%). Among the 32 patients who had a diagnosis of active pulmonary TB infection, the tuberculin test was positive in 20 patients and it was negative in 16 patients.

Key Words: HIV, TB, Lung infection

INTRODUCTION

The HIV infection is a global pandemic. With the availability of highly active anti retro viral therapy and the use of prophylactic antibiotics, the occurrence of opportunistic infections has decreased. Despite the use of prophylactic antibiotics over the years, AIDS most frequently affects the lungs, and hence, the failure of the respiratory system is one of the leading causes of death in HIV/AIDS patients. It has been estimated that 90% of the HIV infected persons live in the developing countries [1], [2]. Overall, the average prevalence rate of HIV among adults in India is about 0.9% and it accounts for 10% of the global HIV burden and 65% of that in south and south-east Asia.^{3,4} In India, there were 2.5 million people living with HIV and AIDS at the end of 2007, while the incidence of TB was approximately 1.8 million cases per year [3].

AIMS AND OBJECTIVES

The primary objective of this study was to assess the relative prevalence of pulmonary infections and TB among HIV seropositive patients. It was also aimed to study the occurrence, the clinical and the radiological profile and the pattern of the pulmonary infections in the HIV disease.

MATERIAL AND METHODS

The present study was conducted at a tertiary care teaching institute in Gujarat, western India. Those patients who visited the Department of Pulmonary Medicine between November 2004 to July 2005 were included in the study. The Ethics Committee of the Institute approved the protocol. A written informed consent was taken from all the patients. Their history was recorded on a pre-designed schedule, which included the socio-demographic profile of the patients, the mode of transmission, the presenting symptoms, opportunistic infections, etc. A detailed physical examination was done for all included patients.

The diagnosis of HIV was confirmed by ELISA and a rapid test, as recommended by the National AIDS Control Organization (NACO).

Each patient was also subjected to routine hematological, biochemical, and bacteriological investigations (sputum acid fast bacilli smears, sputum gram staining and cultures). X-ray of the chest

was taken in all the patients. The Hepatitis B surface antigen and VDRL tests were also done in all the patients.

Special investigations like Giemsa staining and Indian ink preparation staining of the sputum, the computed tomography chest, ultrasound of the chest/ abdomen and body fluid examination were also performed in the patients when indicated. A Trimethoprim-Sulphamethoxazole (TMP/SMX) prophylaxis was given when indicated.

CD4 counts were not done due to financial constraints.

RESULTS

During the period of the study, 50 patients were included in the study. Their socio-demographic characteristics are given in [Table/ Fig 1].

Characteristics	No	Percentage
Gender		
Male	39	78
Female	11	22
Age in years	Male Female	
21-30 yrs	14 5	38
31-40 years	15 4	38
>40 years	10 2	24
Mode of transmission		
Heterosexual contact	34	68
Blood Transfusion	09	18
Not known	07	14
Occupation		
Laborer	18	36
Driver	12	24
Diamond cutter	07	14
Unemployed	13	26
Marital status		
Married	36	72
Spouse status		
Living	32	
Expired	4	
Unmarried	14	28

[Table/Fig 1]: Socio-demographic characteristics of the patients

The commonest mode of acquiring the infection was through heterosexual contact (68%), followed by a blood transfusion history in 18% of the patients, while 14% of the patients did not give any specific history. None of the patients gave a history of drug abuse or homosexual behaviour in our study. The patients were from the lower socio-economic class and were working as labourers (36%), drivers (24%) and diamond cutters (14%), while 26% were unemployed at the time of the hospital visit. The most common presenting complaints were cough, weight loss, fever and chronic diarrhoea. The presenting complaints of the patients are shown in Table /Fig 2. The radiological findings of all the patients are shown in Table/Fig 3. [Table/Fig 2], [Table/Fig 3]

Presenting complaints	No	Percentage
Cough	48	96
Wt loss	48	96
Fever	44	88
Dyspnoea	26	52
Chest pain	25	50
Hemoptysis	12	24
Chronic diarrhoea	35	70

[Table/Fig 2]: Showing presenting combinations among patients when presented to our hospital.

Type of lesion	No of cases	Percentage
Pleural effusion	9	18
Mediastinal lymphadenopathy	8	16
Hydro pneumothorax	1	2
Infiltrates:	32	64
Upper zone	8	16
Lower zone	9	18
Disseminated	15	30
Cavitation	5	10
Upper zone	4	8
Lower zone	1	2
Miliary	5	10

[Table/Fig 3]: Radiological findings among patients in present study: (N=50)

Tuberculosis (72%) was the commonest respiratory infection in the present study, while other infections were found in various proportions in a decreasing frequency, as shown in [Table/Fig 4].

Diagnosis	No	Percentage
Tuberculosis	36	72
Pulmonary	17(47)	
Extra pulmonary	19(53)	
Tuberculin skin test induration:		
0 mm	10	20
1-4 mm	20	40
5-10 mm	13	26
11-20 mm	7	14
Pneumonia	11	22
Streptococcal pneumonia	7(64)	
Staphylococcal pneumonia	3(27)	

Klebsiella pneumonia	1(9)	
Pneumocystis Jiroveci pneumonia	3	6
Cryptococcal meningitis with pulmonary infiltrate	2	4

[Table/Fig 4]: Opportunistic infections diagnosed in HIV positive patients.

The tuberculin test was done in all the 50 patients. The results are shown in [Table/Fig 5].

Tuberculosis	TT positive	TT negative
Pulmonary TB	13	13
Extrapulmonary TB	7	6

[Table/Fig 5]: Showing Tuberculin test (TT) results among TB patients

All the patients with TB were started on the anti TB treatment under the revised national TB control programme.

Bacterial pneumonia was the second most common infection (22%). Among the 11 patients, 7 had streptococcal pneumonia, 3 had staphylococcal pneumonia and 1 had klebsiella infection. The clinical presentation and the outcome of the pneumonia were found to be same, as was seen in the non-HIV patients. They were treated with antibiotics according to their sensitivity profile and their response to treatment was similar to that which was seen in the HIV seronegative patients.

Pneumocystic jiroveci pneumonia was found in 3 (6%) cases. The diagnosis was based on the typical symptoms of malaise and dyspnoea, serum LDH elevation and the X-ray findings of ground glass opacities and low peripheral O₂ saturation. An induced sputum/ bronchoalveolar lavage for pneumocystis was done for all the patients; however, it turned out to be negative. TMP/SMX along with steroids was given to all the patients. Adverse reactions to the therapy were mild and tolerable. One patient died of respiratory failure during the treatment.

Two patients (4%) were diagnosed to have pulmonary fungal infections. One patient had cryptococcal meningitis which was secondary to a lung infection. He was treated with intravenous Amphotericin B, but he succumbed to his illness after 3 days of treatment.

DISCUSSION

The respiratory system is very commonly involved in HIV infected patients. The spectra of respiratory infections include mild community acquired pneumonia to severe life threatening infections and diseases like malignancy. However, we did not find severe and rare cases in the present study. The male to female ratio was 3.55:1. Blood transfusion and heterosexual exposure were the commonest risk factors. Most of the women acquired the infection through their husbands, who in turn got it from commercial sex workers, which was similar to that which was reported by other studies in India [5-8] None of the patients gave a history of intravenous drug abuse or homosexuality. In a study which was conducted by S.Bhagyavatidevi et al in Manipur, intra venous drug abuse was main risk factor (87%), followed by heterosexual exposure and promiscuity(13%) [9]. This may be due to an increased rate of intravenous drug abuse in the north eastern part of India as compared to the western part of India [10-13].

The spectra of the opportunistic infections which were observed in this study were similar to those which were reported from the southern and the northern parts of the country [8], [14]. The prevalence of tuberculosis (38.8%) was highest among the opportunistic infections in HIV seropositive patients. This finding was consistent with those of the studies which were conducted by Neeraj et al and Shrama et al [8], [11] Extra-pulmonary tuberculosis was more

common than pulmonary tuberculosis (47% vs 53%) in the present study, which was in contrast to the studies which were conducted by Zuber Ahmed et al (38% vs 80%), S. Bhagyabati et al (22% vs 77%) [9], [12]. The diagnostic reliability of the skin test was reduced due to the anergy which was caused by HIV. A recent analysis by Saumya Swaminathan et al also confirmed that the tuberculin skin test has a low positive predictive value (18.8-48.8%) in patients with HIV and tuberculosis [13]. Diffuse pulmonary infiltrates/opacities, mediastinal adenopathy and pleural effusions were the dominant radiological presentations and cavitation was uncommon (Table 3) in the present study. This was consistent with the findings of the studies which was conducted by Swaminathan et al and Zubeer Ahmed et al [12], [14].

The second common pulmonary infection was bacterial pneumonia (22%). In all published series, typical pyogenic bacteria and more particularly, *S. pneumonia*, *Staph aureus* and *Klebsiella* were the major responsible bacteria. The kinds of pathogens and their relative frequencies in the present study were consistent with those in most of the published reports [15-17]. In a vast majority of cases, the clinical presentation of HIV-infected subjects with bacterial pneumonia, was similar to that of HIV sero-negative patients with community-acquired pneumonia [18]. The onset was acute or subacute with fever, cough, purulent sputum, dyspnoea and chest pain [19-24]. The physical examination revealed abnormalities, mainly crackles, which was comparable with those reported by previously published series of studies [16]. The radiological findings were also similar to that of the previously reported series of studies and they consisted of multilobar consolidation, bilateral involvement with either patchy bronchopneumonia or alveolointerstitial infiltrates [16], [21]

Though, *Pneumocystis jiroveci* pneumonia remains the commonest AIDS defining illness in the western population, [15] its incidence was much lower in our study (6%). This correlated with other previously and recently published data from India [14], [25-27]. The clinical presentation and the radiological features in our patients were similar to that which were reported by a study which was conducted by Udwardia et al [28].

Similarly Kaposi's sarcoma, atypical mycobacterial infections and disseminated cytomegalovirus disease, which are common in western literature, were not seen in this study. Similar trends were observed in other studies from other parts of India [9], [10], [13]. The incidence of pulmonary fungal infections was low, with a poor outcome.

The strength of our study was that our data came from a tertiary care referral center that caters to general patients and treats HIV/AIDS patients on a day to day basis and so, our results reflect the real situation in a general population of Gujarat, though we had only a small sample size. A limitation of our study was that CD4 counts were not done due to the nonavailability of the lab tests for it inside the hospital and due to financial constraints on the part of the patients due to which they could not get it done from outside laboratories. This was a hospital-based study and the patients who were included were those who reported with respiratory symptoms to the Pulmonary Medicine Clinic. Thus, we may have missed the group of not seriously ill/asymptomatic patients who may have opted to not attend the hospital for care.

CONCLUSION

HIV infection is one of the major infectious diseases in developing countries like India and due to the chronicity of the illness, it has a huge impact as compared to other infectious diseases. People with high-risk behaviour and the spouses of the affected people need to be educated for the primary and the secondary prevention of the disease. Ultimately, we conclude that while managing HIV infected patients, a high degree of suspicion, a detailed clinical history and clinical examination along with the intelligent use of investigations, would help in an early diagnosis of the pulmonary

manifestations and this in turn, would help in the better control and prevention of the complications, morbidity and the spread of drug resistant infections to other populations.

There are not many studies published from western part of India on similar issues, and this data may be helpful for future larger population based survey.

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