Study on the Prevalence of Tuberculosis in HIV Seropositive patients attending the ART Centre, KIMS, Hubli

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Abstract

Background: The incidence of Tuberculosis (TB) has seen a significant rise in association with Human Immunodeficiency Virus (HIV) infection worldwide, in the recent years. It is evident that immunosuppression due to the HIV infection has resulted in modification of the clinical presentation of TB, thereby presenting with atypical signs and symptoms, and also sometimes affecting extra-pulmonary sites.

Objectives: To determine the pattern of presentation and prevalence of TB in HIV Seropositive patients and to study various socio-demographic factors associated with the same seen in the patients attending the Anti-Retroviral Therapy (ART) Centre, Karnataka Institute of Medical Sciences (KIMS), Hubli.

Methods: A cross-sectional study was conducted among 109 HIV Seropositive patients attending ART Centre in KIMS, Hubli, for a period of 2 months. A pretested, semi-structured questionnaire was applied to collect the data from the study participants after obtaining the verbal informed consent.

Results: The prevalence of HIV-TB among the study participants was estimated to be around 34.9%. Although HIV infection was found to be more in females in the study, TB with HIV infection was seen majorly in males. The commonly affected age group was 31-40 years, both in HIV infection alone and TB co-existing with HIV. Pulmonary TB was the commonest type of TB i.e., 92.1% among the HIV patients of the study. The prevalence of TB was found to be maximum in the cases with CD4 count of range less than 250 cells/cu.mm.

Conclusion: The prevalence of TB in HIV Seropositive patients was more than one third as per the study and hence it is of utmost concern that HIV patients should be screened and treated for TB as early as possible, and the prophylaxis of TB in HIV patients must be considered.

Key Words: *Prevalence, Tuberculosis (TB), Human Immunodeficiency Virus (HIV), Acquired Immunodeficiency Disease Syndrome (AIDS)*

Introduction

Recognized as an emerging disease only in the early 1980s, HIV infection has rapidly established itself throughout the world and is likely to endure and persist well into the 21st century. HIV infection has evolved from a mysterious illness to a global pandemic which has infected tens of millions in less than 20 years.

According to the recent estimates by the WHO and Joint United Nations Programme on HIV/AIDS (UNAIDS), nearly 36.7 million people were living with HIV/AIDS worldwide, up from 28.9 million in 2001.[1,2] Globally, TB remains the most common cause of death among patients with HIV/AIDS, killing 1 of 3 patients.[3]

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As per estimates, about 2.1 million people were living with HIV infection in the year 2015, in India, with around 86,300 new HIV infections.[4] About half of them are co-infected with Mycobacterium Tuberculosis; thereby gradually develop active TB in association with HIV infection.[5]

Available evidence on prevalence of HIV infection and future statistical projections shows signs of stabilization of HIV epidemic in India at national level. However, one thing must be remembered in case of HIV-TB, as both these diseases are a deadly combination; they are far more destructive together than either disease alone. HIV infection is the strongest of all known risk factors for development of TB. An individual who is HIV Seropositive has 10 times increased risk of developing TB compared to an HIV Seronegative person.[5]

As a result of HIV/AIDS, incident rates of TB in certain countries have gone up by more than 6 percent per year, crippling the already overburdened health care resources.[5] HIV infection and TB are also intricately linked to malnutrition, unemployment, alcoholism, drug abuse, poverty and homelessness. The direct and indirect costs of illness due to TB and HIV infection are enormous. It has a catastrophic impact on the economy in the developing world. Thus, co-infection with HIV and TB (HIV-TB) is not only a medical malady, but a social and an economic disaster and is aptly described as the "cursed duet".

Hence, this study was undertaken to determine and to ascertain the prevalence of TB in HIV Seropositive patients and the pattern of presentation of TB in HIV infected patients seen at ART centre, KIMS Hubli. It also added the details to the pool of local data on patients presenting with these dreaded diseases.

Methods

A cross-sectional study was conducted for a period of 2 months, to study the prevalence of TB in HIV Seropositive cases attending ART Centre of Karnataka Institute of Medical Sciences, Hubli.

Before approaching the patients, permission was taken from the Medical Officer of ART Centre at KIMS Hubli. A convenient sample size of total 109 subjects were included in the study. The patients who are aged above 18 years and confirmed to be HIV Seropositive through necessary investigation reports were considered for the study. CD4 count of the patients were also obtained from the records.

The data was collected by personal interview of the participants with verbal informed consent after explaining in their own language (Kannada, Hindi, and English). The confidentiality of the details of the patients were maintained throughout the study. Those who were reluctant to participate in the study or hesitant to share the information were excluded from the study. A pre-tested, semi-structured questionnaire was used to collect the demographic information and other relevant details of the study participants.

Statistical Analysis

Data was entered in MS-Excel and analysed using SPSS-21 software. The results were expressed in frequencies and percentages in the tables and figures. Appropriate statistical tests were used wherever required.

Results

Among 109 study participants who were HIV Seropositive, majority were females i.e., about 59 (54.2%) and remaining 50 (45.8%) were males. The participants of the study ranged from the age of minimum 21 years to maximum 65 years. Majority of them i.e., 40.4% belonged to the age group 31-40 years. In the study, about 45.8% of the patients fall into Socio-Economic Status (SES) of middle class as per Modified BG Prasad Classification. Most of the study subjects were married i.e., 56.9%, followed by widowers, and only a few were either separated or single. (Table 1)

Table 1: Distribution of study participants based on their socio-demographic characters

Socio-demographic Characters		Frequency	Percentage
Gender	Male	50	45.8%
	Female	59	54.2%
Age Group (in years)	21-30	26	23.8%
	31-40	44	40.4%
	41-50	27	24.8%
	51-60	7	6.4%
	> 60	5	4.6%
SES	Upper Class	0	0.0%
	Upper Middle	27	24.8%
	Middle	50	45.8%
	Lower Middle	32	29.4%
	Lower Class	0	0.0%
Marital Status	Married	62	56.9%
	Widower	35	32.1%
	Separated	8	7.3%
	Single	4	3.7%

In the study, about 38 of the HIV Seropositive patients i.e., 34.9% of them were co-infected with TB (Figure 1). On further analyses, the co-existence of TB with HIV infection was found to be more in males, and common in the age group 31-40 years. Patients belonging to Hindu religion, who were married, and also unskilled by their occupation were more prevalent in having TB along with HIV infection. However, all these findings were not statistically significant. The only finding which was found to be statistically significant in the study was locality of the study subjects, indicating that people from urban areas were more prone to develop both HIV infection and TB. (Table 2)

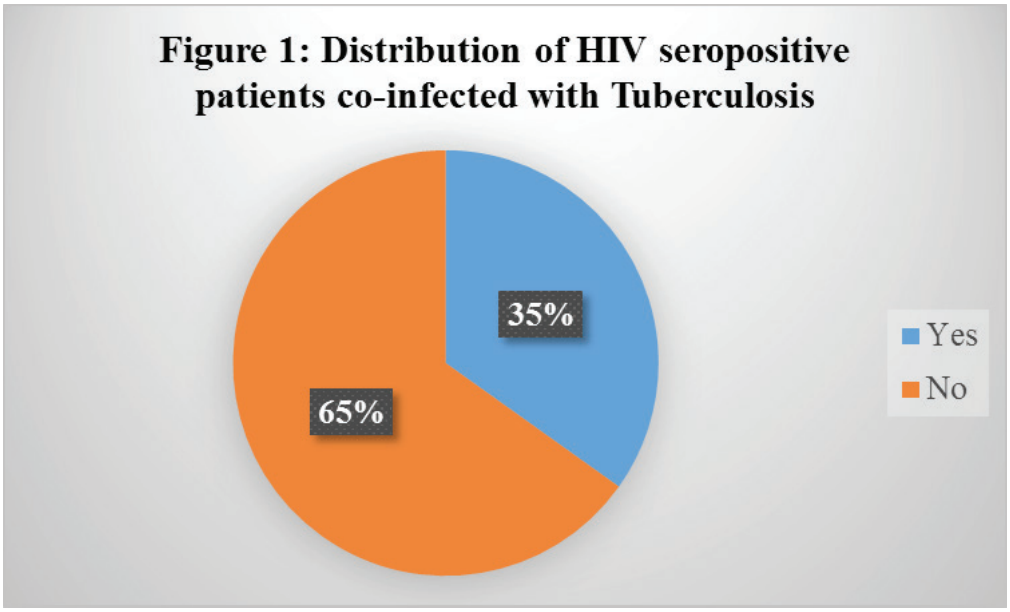


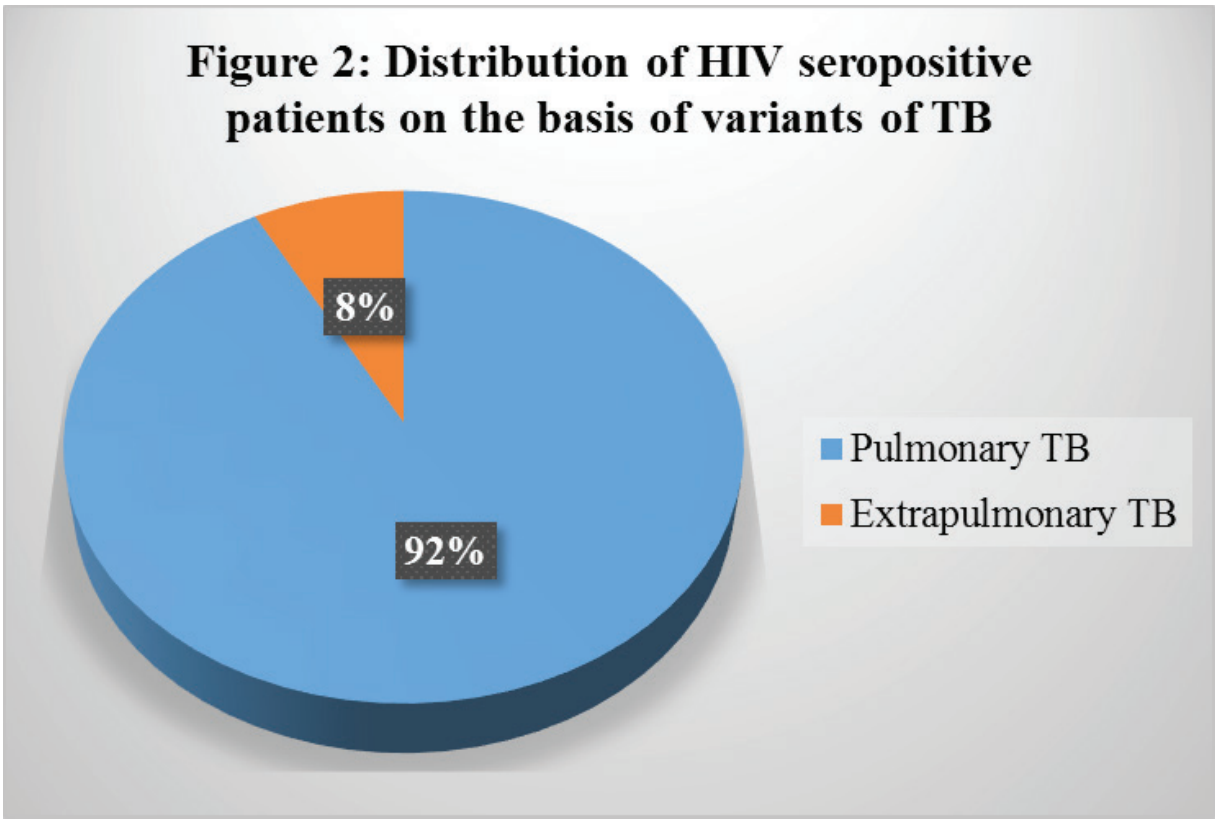
Table 2: Prevalence of Tuberculosis among HIV Seropositive patients with respect to their socio-demographic characters

Socio-demographic Characters		TB Present	TB Absent	Chi-square value	p-value
Gender	Male	20 (52.64%)	30 (42.25%)	1.0737	0.30
	Female	18 (47.36%)	41 (57.75%)		
Age Group (in years)	21-30	9 (23.69%)	17 (23.94%)	0.7518	0.94
	31-40	15 (39.47%)	29 (40.84%)		
	41-50	10 (26.32%)	17 (23.94%)		
	51-60	3 (7.89%)	4 (5.64%)		
	> 60	1 (2.63%)	4 (5.64%)		
Religion	Hindu	32 (84.21%)	60 (84.51%)	0.0017	0.97
	Muslim	6 (15.79%)	11 (15.49%)		
Locality	Urban	27 (71.05%)	36 (50.71%)	4.2018	<0.05
	Rural	11 (28.95%)	35 (49.29%)		
Marital Status	Married	23 (60.53%)	39 (54.92%)	5.2688	0.07
	Widower	8 (21.05%)	27 (38.02%)		
	Separated	5 (13.15%)	3 (4.23%)		
	Single	2 (5.27%)	2 (2.83%)		
Occupation	Unemployed	10 (26.32%)	23 (32.39%)	3.521	0.47
	Unskilled	11 (28.95%)	24 (33.81%)		
	Semi-skilled	9 (23.69%)	17 (23.93%)		
	Skilled	4 (10.52%)	2 (2.83%)		
	Semi-professional	4 (10.52%)	5 (7.04%)		

Among the total population studied, majority i.e., around 66.9% of them were having the count of CD4 cells less than 250 per cubic millimetre. Even this was same on considering the patients with both HIV infection and TB, thereby implying that HIV Seropositive patients with CD4 count less than 250 cells/cu.mm. are at higher risk in developing TB (Table 3). In the figure 2, it is observed that out of 38 patients who are having both HIV infection and TB, most had developed Pulmonary TB i.e., 35 of them. (Figure 2)

Table 3: Prevalence of Tuberculosis among HIV Seropositive patients with respect to the count of CD4 cells

CD4 cells Count (in cells/cu.mm)	TB Present	TB Absent	Chi-square value	p-value
0-250	28 (73.69%)	45 (63.38%)	3.9858	0.26
251-500	5 (13.15%)	19 (26.75%)		
501-750	2 (5.27%)	5 (7.04%)		
>751	3 (7.89%)	2 (2.83%)		



Discussion

In the current study, the prevalence of Tuberculosis in HIV Seropositive cases was estimated to be 34.9%. Although this is quite significant value, it is less compared to previous other studies.[6] One important observation which should not be missed is that these patients might have either had TB earlier or developed during the course of the HIV infection. The commonest type of TB found among the study subjects was pulmonary TB accounting for 92.1% of cases, while extra-pulmonary TB accounted for only 7.9% of cases. This relatively low prevalence of extra-pulmonary TB could be attributed to the unavailability of required diagnostic facilities.

As per the study, the most common age group of patients both in case of HIV infection alone and co-infection with HIV and TB was 31-40 years. This is almost similar to the findings obtained from the study done by Affusim CC et al.[7] In the study, majority of the HIV Seropositive patients were females. However, in case of HIV Seropositive patients who also have been diagnosed with TB, males were leading in the proportion. This could be due to the fact that males are more exposed to outer environment compared to females.

The distribution of TB cases among HIV Seropositive patients was found to be commoner in those who are residing in urban areas i.e., 71%. This is contrast to the study conducted by SK Jain et al where the majority cases were from rural areas.[8] This is more likely due to the limitation in catchment area of our study. The religion of the patients in the study who are infected with both HIV and TB was noted that majority of them were Hindus. This matches with the findings from the report by Preetish et al.[9]

Conclusion

The results of this study provide the information regarding the high risk of development of active TB in the persons infected with HIV. Such that more than one third of the study participants who had been diagnosed as HIV Seropositive were found to be co-infected with TB also. In the developing countries, tuberculosis is the commonest opportunistic infection among patients with HIV/AIDS. This calls for important steps to be taken to prevent the TB infection among the HIV Seropositive through proper measures, and to treat TB as soon as possible if it has already been developed.

Limitations

· The sample size of the study was limited to only 109 patients

· Duration of study was short.

· Study was conducted in only one ART Centre.

· Convenient sampling was done because of the time constraints.

Recommendations

· It is strongly recommended that a large scale multicentre prospective study is to be done to see the real TB/HIV co-morbidity and the course of TB in HIV infected cases.

· Better diagnostic facilities should be made available to reduce the morbidity and mortality owing to TB among HIV Seropositive patients.

· Prophylaxis of TB among HIV Seropositive patients should be taken into consideration as this could significantly reduce the associated morbidity. This also holds good with the public health point of view.

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Declaration

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Ethical approval: Not required

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