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Original Research Article

Prevalence of coinfection of human immunodeficiency virus and tuberculosis in a semi urban area in Telangana

Jahnavi K., Leelabati Toppo*

Department of General Medicine, Mallareddy Medical College for Women, Hyderabad, India

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***Correspondence:**
Dr. Leelabati Toppo,
E-mail: jahnavikodidela@gmail.com

ABSTRACT

Background: HIV is known to be one of the major risk factors for the progression of active tuberculosis. Seronegative individuals have 10% risk of developing tuberculosis in an endemic region, while those infected with HIV have 60% chances. Moreover, this incidence varies with different geographical area.
Methods: 1330 of HIV patients and 1800 suspected TB patients had undergone testing for HIV. All the suspected TB patients had undergone X ray evaluation and sputum examination.
Results: 482 were positive for tuberculosis among 1800 patients of whom 286 were males and 196 were females. Out of a total of 3130 patients who have undergone HIV test, 115 were found to be HIV Seropositive with 68 (3.6%) males and 47 (3.8%) females.
Conclusions: It is essential to impart proper education to the people as they are from a low socioeconomic background regarding the usefulness of the HIV and the TB testing and the government protocols and measures taken to eradicate this disease.

Keywords: Coinfection, HIV, Tuberculosis

INTRODUCTION

Human Immunodeficiency Virus associated Tuberculosis form a very grave public health hazard. HIV is one of the most significant challenges faces globally, especially in the lower economic and middle-income countries of the world. In 2012, it was estimated that approximately 35.3 million people worldwide were living with HIV, with around 8 million new cases every year. Of these 32.1 million were adults, 17.7 million were females and 3.3 million were children under 15 years of age.[1] In the year 2009, 2.6 million individuals had become newly infected. 1.8 million persons had died of AIDS that year alone.[2,3] In India, the estimate of HIV seropositive individuals has been estimated to be 2.5 million.[4]

9.6 million people globally have been estimated to have TB in 2014 with 5.4 million of them being men, 3.2 million women and 1.0 million children. There were 1.5 million deaths in this year due to the disease.[5,6] India is said to have the largest number of tuberculosis (TB) cases in the world with about 14 million cases living with TB it is estimated that about 1.8 million incident cases of TB occur in India every year of which 0.82 million are highly infectious smear positive cases.

It has been reported that the prevalence of tuberculosis infection is higher in HIV positive individuals.[5] It is also reported that when the HIV seropositive patients become infected with tuberculosis, the risk of developing the clinical disease is higher and faster. The coinfection of TB in the HIV positive patients is on an alarming rise in

the developing countries where both these infections are independently being prevalent in large numbers. WHO has now given alarming estimated of the coinfection and has recognized TB to be one of the most important opportunistic infections of HIV, which is of great concern.[7] It is seen that when a person is infected with both the diseases, one is known to speed up the other. In other words, not only does HIV speed up the latent infection of TB into an active one, TB is also known to accelerate the progression of HIV infection.[8]

It has been estimated that 33.3 million people are living with HIVHIV is known to be one of the major risk factors for the progression of active tuberculosis. Seronegative individuals have 10% risk of developing tuberculosis in an endemic region, while those infected with HIV have 60% chances.[9] Moreover, this incidence varies with different geographical area. Therefore, effective diagnosis and treatment is of utmost importance, else if this disease goes undetected, there is a good chance in the rise in mortality. This study was therefore conducted to evaluate the prevalence of the coinfection of HIV and TB in our geographical area.

METHODS

The study was conducted in Mallareddy medical college for women during March 2014 to February 2017. 3130 samples were collected from patients attending the Tertiary Care Hospital. Out of these, 1800 had attended the TB clinic and 1330 had attended the HIV centre (ICTC).

To all the patients who had attended the integrated counseling and testing centre for HIV, the testing for HIV and its importance was explained in the counseling centre of our hospital as per the NACO norms in total confidentiality. Informed consent was obtained from the patient and 5ml blood samples were collected from all of them in plain tubes. The tubes were sent to the respective department for analysis, where they were centrifuged and tested with TRIDOT method. Confirmation was done with two other methods with different principles as per NACO protocols when the serum was seropositive. All patients who were seropositive were sent for TB testing.

All the patients who had attended the TB and chest department of the hospital, complete physical and clinical examination was done. All the patients who were suspected for TB were included into the study and were sent for chest X-ray and sputum for acid fast bacilli test. These patients were asked to give 2 samples, one random and one early morning sample. All these samples were tested in the Direct microscopy centre of our hospital by performing the acid-fast staining technique for the identification of Mycobacterium tuberculosis. HIV test was done as per the protocol for all these patients with informed consent.

RESULTS

Out of 1800 samples suspected for TB, 997 were male and 803 were females. 482 were positive for tuberculosis among these. Among 286 male members, the highest prevalence was observed in the 41 to 50 age group in the males and 51- 70 age group in the females (Table 1).

Table 1: Distribution of tuberculosis according to age and gender.

Category	Male			Female		
Age	**Positive**	**Negative**	**Total**	**Positive**	**Negative**	**Total**
5-10	19 (24.4%)	59 (75.6%)	78	19 (13.8%)	119 (86.2%)	138
11-15	45 (25.4%)	132 (74.6%)	177	27 (19.1%)	114 (80.9%)	141
21-30	61 (24.3%)	160 (63.7%)	251	28 (19.3%)	117 (80.7%)	145
31-40	91 (32.7%)	187 (67.3%)	278	31 (30.1%)	72 (69.9%)	103
41-50	42 (40%)	63 (60%)	105	40 (26.8%)	109 (73.2%)	149
51-70	28 (25.9%)	80 (74.1%)	108	51 (40.1%)	76 (59.8%)	127
Total	286 (28.7%)	681 (68.3%)	997	196 (24.4%)	607 (75.6%)	803

Table 2: Distribution of HIV sero positive and co-infection tuberculosis according to age and sex.

Category	HIV male			HIV female		
Age	**Positive**	**Negative**	**Total**	**Positive**	**Negative**	**Total**
5-10	4 (2.3%)	167 (97.7%)	171	1 (0.7%)	126 (99.3%)	127
11-20	8 (2.2%)	350 (97.8%)	358	6 (3.2%)	183 (96.8%)	189
21-30	13(2.7%)	474 (97.3%)	487	12 (4.2%)	274 (95.8%)	286
31-40	23 (5.8%)	373(94.2%)	396	13 (5.1%)	241 (94.9%)	254
41-50	14 (5.1%)	258 (94.9%)	272	11(4.4%)	180 (95.6%)	191
51-70	6 (2.9%)	201 (97.1%)	207	4 (2.1%)	188 (97.9%)	192
Total	68 (3.6%)	1823 (96.4%)	1891	47 (3.8%)	1192 (96.2%)	1239

This study shows that a total of 3130 patients who have undergone HIV test, 115 were found to be HIV Seropositive. Age group of 31-40 are at a higher risk of HIV due to the sexually active age group. Of the total HIV positive cases, 68 (3.6%) were male and 47 (3.8%) were females (Table 2).

Table 3: Co-infections in HIV and TB positive individuals.

Gender	Tuberculosis	HIV	Co-infection
Male	286	68	7
Female	196	47	4
Total	482	115	11

*includes 1800 of TB cases.

Co infection in the present study was observed in 11 (0.4%) of the cases. Out of these, 7 were males and 4 were females (Table 3).

DISCUSSION

A coinfection of TB and HIV is a global public emergency. Both of these diseases, individually are of great concern to man and with these together is highly detrimental. This is more in the developing countries, where the TB is endemic in nature with 1 in every 3 individuals affected and HIV picking up speed. The coinfection in the Asia-Pacific region is still poorly understood as there is not much data regarding its prevalence. Moreover, the treatment of the coinfected patient is also of a great concern due to the debilitating nature of the drugs of both the diseases.[10]

This study shows that a total of 3130 patients who have undergone HIV test, 115 were found to be HIV Seropositive. Age group of 31-40 are at a higher risk of HIV due to the sexually active age group. Of the total HIV positive cases, 68 (3.6%) were male and 47 (3.8%) were females. This study was corroborated by a similar study by Saha et al, were in most of the HIV seropositive cases were in the 31-40 age group, which is a sexually active age, and most of them were away from their family for a long time11. Only 1% of the cases in this study were transfusion related. However, in a study by Gupta et al, 75% of the HIV positive patients belonged to the 45-60 years age group.[12]

Co-infection in the present study was observed in 0.4% of the cases. In a study in Udipi, a very high prevalence of 18.6% of a coinfection of TB and HIV was observed. It was found to be more in the case of males as in our study, especially in the sexually active, males, where the education was poor and living in the rural areas, and belonging to the lower socioeconomic strata.[13] This was similar in other studies conducted in different parts of India.[14-17]

Around the world however, a wide variation was observed in the rate of coinfection ofthese two deadly diseases. 66% of newly diagnosed TB patients in a study in Uganda were found to be HIV positive, while 60% reported in a study in Zambia.[18,19] However, a low prevalence of 3.4% was observed in a study in U.S.A.[20]

There was a wide variation found in India too. In a study by Solomon et al, only 0.77% of the TB patients were found to be seropositive for HIV, which was similar to our study.[21] Banavaliker et al also reported an incidence of 0.5% of HIV in hospitalized TB patients.[22] Jaiswal et al reported a higher rate of 4% in Pune, while Mohanty et al reported an alarming 10.15% in Mumbai.[23,24]

CONCLUSION

This study has shown a low incidence, probably because study hospital is situated in a semi urban area, where the social stigma of TB and HIV is high. It is a possibility that the patients shy away from the testing for both these diseases. It is therefore essential to impart proper education to the surrounding areas regarding the usefulness of the HIV and the TB testing and the government protocols and measures taken to eradicate this disease.

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