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RESEARCH ARTICLE

HIV SEROPREVALENCE AMONG TUBERCULOSIS PATIENTS IN EAST MIDNAPORE DISTRICT OF WEST BENGAL, INDIA

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ABSTRACT

HIV is the most important known risk factor that promotes progression to active TB in people with *Mycobacterium tuberculosis* infection. The lifetime risk of tuberculosis in immune competent persons is 5% to 10%, but in HIV positive individuals, there is a 5% to 15% annual risk of developing active TB disease. In India, there were 2.5 million people living with HIV and AIDS (PLWHA) at the end of 2007 while the incidence of TB was approximately 1.8 million cases per year. Hence, the present study was undertaken to determine the prevalence of HIV amongst a cohort of TB patients registered in selected Tuberculosis Units (TUs) of Revised National Tuberculosis Control Program (RNTCP) in East Midnapore, West Bengal, India. The present study shows that the prevalence of HIV among TB patients registered under RNTCP is 3.9% at three T.Us. of East Midnapore district of West Bengal, India. HIV was more prevalent among men than women (2.8% vs 1.1%).

INTRODUCTION

Human immunodeficiency virus infection/acquired immunodeficiency syndrome (HIV/AIDS) is a disease of the human immune system caused by infection with human immunodeficiency virus (HIV) (Sepkowitz, 2001). During the initial infection, a person may experience a brief period of influenza-like illness. This is typically followed by a prolonged period without symptoms. As the illness progresses, it interferes more and more with the immune system, making the person much more likely to get infections, including opportunistic infections and tumors that do not usually affect people who have working immune systems. The increasing rate of human immunodeficiency virus (HIV) infection in many countries has had an impact on tuberculosis (TB) epidemiology. TB incidence continues to rise, especially in countries most severely affected by the HIV epidemic. HIV is the most important known risk factor that promotes progression to active TB in people with *Mycobacterium tuberculosis* infection (TB/HIV a Clinical Manual, 2004). The lifetime risk of tuberculosis in immunocompetent persons is 5% to 10%, but in HIV positive individuals, there is a 5% to15% annual risk of developing active TB disease (Swaminathan *et al.,* 2000).

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WHO estimated 9.2 million new cases of TB globally in 2006 (139 per 100,000); of whom 7,09,000 (7.7%) were HIV positive (World Health Organization, 2008). India, China, Indonesia, South Africa and Nigeria rank first to fifth in terms of incident TB cases. TB is a leading cause of morbidity and mortality in patients with HIV/AIDS (Harris *et al*., 2004 and Raviglione *et al*., 1992). The 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" (Russel *et al*., 2004).

In India, there were 2.5 million people living with HIV and AIDS (PLWHA) at the end of 2007 while the incidence of TB was approximately 1.8 million cases per year (WHO, Release 2007; RNTCP, 2008). In a survey carried out among new tuberculosis patients by the Revised National TB control Program (RNTCP) in 2007, HIV sero-prevalence varied widely and ranged from 1% to 13.8% across the 15 districts (Central TB Division, unpublished observations). Adverse interaction between human immunodeficiency virus (HIV) infection and tuberculosis (TB) poses difficult challenges to public health programmes (Havlir *et al.*, 2008). Detection of HIV infection among TB patients offers the opportunity to deliver prompt HIV care, such as cotrimoxazole prophylaxis and antiretroviral treatment, which can reduce suffering and death.

The dual impact of the diabetes and HIV epidemic on RNTCP can be devastating. Public health measures to contain the epidemics need to be initiated at the earliest to combat the impact of either HIV or diabetes on tuberculosis. The initial step in this effort is an accurate assessment of the magnitude of these diseases in tuberculosis patients registered under the RNTCP. Hence, the present study was undertaken to determine the prevalence of HIV amongst a cohort of TB patients registered in selected Tuberculosis Units (TUs) of Revised National Tuberculosis Control Program (RNTCP) in East Midnapore, West Bengal, India.

MATERIALS AND METHODS

Study area

East Midnapore has 9 Tuberculosis Units (TU). Three of these nine TUs were selected at random for undertaking the present study. The three TUs were Egra, Moyna and Paikpari. So, in reference in my study regarding the prevalence of HIV among Tuberculosis patients, I intend my research work in the area consisting of Moyna T.U., Egra T.U. and Paikpari T.U. that covers the population approx 15 lakhs .

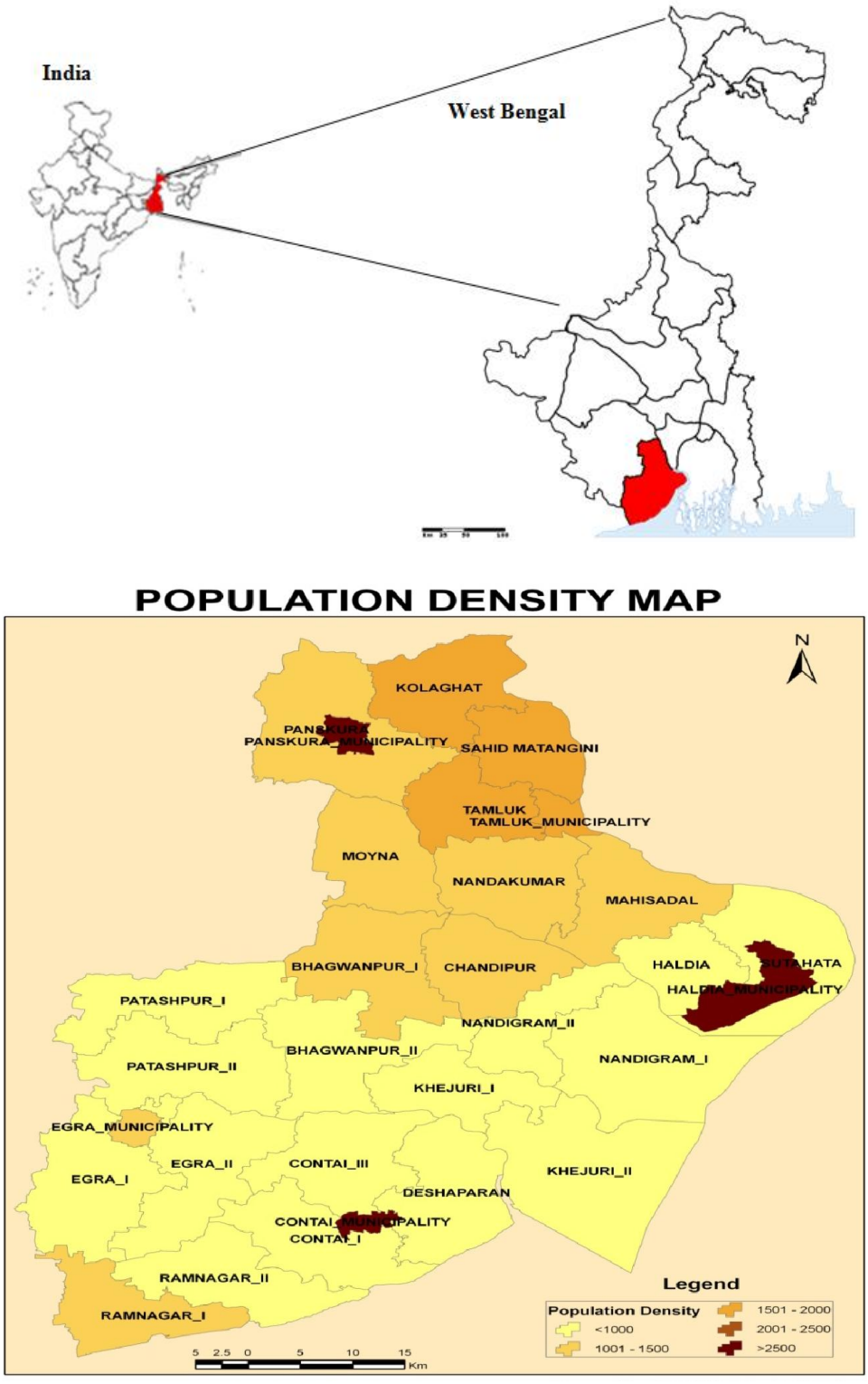

Fig. 1. Location of Selected Tuberculosis Units (T.U.) of East Midnapur District, West Bengal, India

Egra TU is situated in the north/east/west/south of the district. It serves two blocks namely Egra-I, Egra-II and Pataspur-II catering to a population of 600975. It is a predominantly urban TU and the TU headquarters are at Egra which is 90 kms away from the district town of Tamluk.

Moyna TU is situated in the north/east/west/south of the district. It serves two blocks namely Moyna and Nandakumar, catering to a population of 496143. It is a predominantly rural TU and the TU headquarters are at GarMoyna which is 20 kms away from the district town of Tamluk.

Paikpari TU is situated in the north/east/west/south of the district. It serves two blocks namely Panskura-1 and Panskura-II catering to a population of 622989. It is a predominantly rural TU and the TU headquarters are at Uttar Mechogram which is 35 kms away from the district town of Tamluk.

Study population

All patients registered in the Tuberculosis Register of the three study units.

Study period

Survey was conducted throughout 36 Months (2011- 2013).

Study design

This cross-sectional study was designed to collect data from the TB of all patients registered under the RNTCP.

Study variables

The study variables collected for the present study were

- Name & Address
- Age
- Sex
- Occupation
- Family members
- Earning members
- Monthly income
- Pulmonary / Extra Pulmonary
- Category
- Result of Diagnosis
- Blood Sugar Status (P.P.)
- HIV Status

Study tools

- Predesigned and pretested proformas to collect data from the tuberculosis registers.
- Whole Blood Finger pick test kits , ELISA test kits (comb-I, comb-II, comb-III) for the diagnosis of HIV (Annexure 7)

Diagnosis of HIV

Venous blood was drawn and serum collected from a diagnostic patient. According to RNTCP guideline all TB patients for referred for HIV Test to ICTC. HIV status was determined using two rapid tests. HIV Tests was based on ELISA.

Whole Blood Finger Print Test: This test done for screening. If the result was negative, then blood is to be considering free of HIV. If positive, the patient was referred to ICTC for confirmation.

Principles of ELISA

ELISA is the most commonly performed screening test. An ELISA consist of either HIV antigen or antibody (depending on the principle), attached on a solid phase and incorporate on conjugate and substrate detection system. Viral antigen may be whole virus lysates, recombinant or synthetic peptides. The matrix can be well or strips of microplate, plastic beads or niro-cellulose paper. Conjugates are most often antibodies (IGG, sometimes IgM and LgA Also) coupled to enzymes (alkaline phosphates or horse-radish peroxide), fluorochromes or other reagents that will subsequently bring about a reaction that can be visualized. In case of enzyme conjugate the signal generated is a colour reaction and in case of fluorochrome, it is fluorescence. ELISA tests are generally easy to perform but require careful adherence to procedure any deviation in incubation times and / or temperature and pipetted volume can dramatical change tests results.

ELISA - I, II, III

- **Strategy I:** Serum is subjected to ELISA / Simple / rapid test for HIV. If results were negative the serum is to be considered free of HIV. If positive the sample is taken HIV infected

- **Strategy II:** A serum sample is considered negative for HIV if the first ELISA report is so, but if reactive, it is subjective to 2nd ELISA confirm the report of the first ELISA.

- **Strategy II:** It is similar to strategy II with the added confirmation of a third reactive ELISA test being required for a sample to be reported HIV positive Strategy III is used to diagnose HIV infection in a symptomatic individual indulging a high-risk behavior.

Data analysis

After the data had been collected from each facility, the results were entered inMS-Excel software (Microsoft Corp.) Data cleaning was done using the MS-Excel. Both tabular and graphic presentations were made from the quantitative data. Means (averages), medians, ranges and proportions for the variables were generated using the Epi-info software. Comparison between the facilities was done using the chi-square test (3*2 tables). Bar graphs were created using Microsoft Excel that showed how the indicators in the different facilities might vary.

RESULTS

Table 1 shows that the age group of the study subject was <14 years 5 (1.4%). 358 (8.6%) out of 363 patients were aged more than 14 years. The screening of HIV among Tuberculosis patients was 14 (3.9%) out of 363 patients and 349 (96.1%) patients was HIV negative out of 363 patients.

Table-2 shows that out of 363 patients 324(90%) have pulmonary TB and among them 258(71%) were males and 66(18%) were female. Among the 363 patients only 14(3.8%) HIV positive and among them 10(2.7%) are males and 4(1.1%) are female.

Table1. Disease characteristics of the cohort

Variable		Number	%
Disease type	Pulmonary	324	89.3
	Extra pulmonary	39	10.7
Category	I	323	89.0
	II	40	11.0
Sputum grade at diagnosis	Negative	70	19.3
	Scanty	25	6.9
	1+	161	44.4
	2+	44	12.1
	3+	63	17.4
Diabetes	Diabetes	45	12.4
	Non-diabetes	518	87.6
HIV	Positive	14	3.9
	Negative	349	96.1

Table 2. Differences in disease characteristics among males and female diabetic tuberculosis patients

Variable		Male	Female	Chi Square	p- value
Disease type	Pulmonary	258	66	10.64	0.01*
	Extra pulmonary	22	17		
Category	I	246	77	1.58	0.21
	II	34	6		
Sputum grade at diagnosis	Negative	46	24	10.12	0.04*
	Scanty	16	9		
	1+	125	36		
	2+	35	9		
	3+	38	5		
Diabetes	Diabetic	41	4	5.69	0.02*
	Non-diabetic	239	79		
HIV	Reactive	10	4	0.27	0.60
	Non-reactive	270	79		

DISCUSSION

The burden of HIV among Tuberculosis patients varies widely in India. The distribution of HIV, however, is highly heterogeneous, and HIV prevalence may be increasing in some area, while stable or decreasing in others (NACO. 2006). The present study shows that the prevalence of HIV among TB patients registered under RNTCP is 3.9% at three T.Us. of East Midnapur district of West Bengal, India. HIV was more prevalent among men than women (2.8% vs. 1.1%).This survey has important implications for the Indian Tuberculosis control programme and HIV/AIDS control Programme.

The association of HIV with TB in this study similar to that of findings of WHO (2004). The prevalence of HIV among Tuberculosis patients exceeded 5% in eight of nine districts from states consider to have high HIV prevalence (Andhra Pradesh, Karnataka, Maharashtra, and Tamil Nadu).

Conclusion

The burden of HIV among Tuberculosis patients varies widely in India. The prevalence among TB patients is 3.9% in my study area. HIV was more prevalent among men than women.

REFERENCES

Harries, A., Maher, D. and Graham S. TB/HIV: a clinical manual. 2nd edition. Geneva: World Health Organization; 2004.WHO/ HTM/TB/2004; 329.

Raviglione, M. C., Narain, J. P. and Kochi, A. HIV-associated tuberculosis in developing countries: clinical features, diagnosis and treatment. *Bull World Health Organ* 1992; *70*: 515-25.

Russell, S. The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/ acquired immunodeficiency syndrome. *Am J Trop Med Hyg* 2004; *71* (Suppl 2): 147- 55.

Swaminathan, S., Ramachandran, R., Baskaran, G., Paramasivan, C. N., Ramanathan, U., Venkatesan, P., Prabhakar, R. and Datta, M. 2000. Risk of development of tuberculosis in HIV infected patients;*Int. J. Tuberc. Lung Dis.* 4 839–844

TB/HIV, A Clinical Manual, WHO 2004 accessed from *http://libdoc.who.int/publications/2004/9241546344.pdf on 25/05/2008*

Havlir, D. V., Getahun, H., Sanne, I. and Nunn, P. Opportunities and challenges for HIV care in overlapping HIV and TB epidemics. JAMA 2008; 300: 423–430. Illn 3: 228–245.

National AIDS Control Organization, Ministry of Health and Family Welfare, India. HIV sentinel surveillance and HIV estimation, 2006. Incidence. BMC Public Health 7: 234.

Ruslami, R., Aarnoutse, R. E., Alisjahbana, B., van der Ven, A. J. and van Crevel, R. 2010. Implications of the global increase of diabetes for tuberculosis control and patient care. Trop Med Int Health 15: 1289–1299.

Sepkowitz, K. A. 2001. "AIDS the first 20 years". *N. Engl. J. Med.* 344 (23): 1764–72. doi:10.1056/NEJM200106073442306. PMID 11396444.

The STOP TB Partnership; Stop TB partnership and World Health Organization. Global plan to Stop TB 2006-15. World Health Organization, Switzerland; 2006.

Tuberculosis Research Centre, Chennai. Trends in the prevalence and incidence of tuberculosis in south India. *Int J Tuberc Lung Dis* 2001;5:142-157.

World Health Organization. Interim policy on collaborative TB/HIV activities, 2004.

World Health Organization. Interim policy on collaborative TB/HIV activities, 2008.

World Health Organization (2007) Tuberculosis Fact Sheet No. 104. Available: http://www.who.int/mediacentre/ factsheet/ fs104/en/print.html. Accessed 25 Setpember 2007.

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