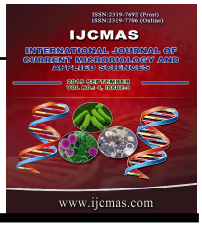
International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 9 (2015) pp. 744-748**
http://www.ijcmas.com



Original Research Article

Prevalence of HIV-TB Co-Infection and Study of its Epidemiological Variant among Patient's Attending ICTC and RNTCP Center of Government Medical College & Hospital, Akola in Maharashtra, India

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Keywords

Human immune-deficiency virus, Tuberculosis, Co-infection.

A B S T R A C T

Diagnosing tuberculosis in Human Immunodeficiency Virus (HIV) infected person is a major public health challenge. Aim: To find the number and percentage of patients co-infected with HIV-TB in Government Medical College & Hospital, Akola of Maharashtra in view of the significance of TB in HIV. Its association with age and gender was also determined. All newly diagnosed HIV positive patients from the Integrated Counseling and Testing Centre (ICTC) were enrolled in the TB screening study and all TB positive patient having sign and symptom suggestive of HIV were also included. As per RNTCP guidelines two sputum samples were collected from each patient for smear examination by Ziehl Neelsen technique. The study population consists of total 184 patients with HIV infection. The overall prevalence with co infection of *Mycobacterium tuberculosis* (MTB) and HIV was 17.93 %. Out of these 21 were males and 12 were females. Conclusion: Screening of all HIV positive patients for TB and all HIV suspected TB positive patient as per our national programs has increased the rate of diagnosis of co infected patient helping to institute early therapeutic management of such patient and increased survival rate

Introduction

Human Immunodeficiency Virus (HIV) and Tuberculosis (TB) are closely associated. HIV promotes the progression from latent TB infection to active disease and TB is the leading infectious killer of people living with HIV.

The worldwide epidemic of HIV infection has contributed to a resurgence of TB, now a leading cause of HIV related morbidity and mortality (Dye, 2006).

An HIV positive person co-infected with MTB has 50-60% life time risk of developing TB disease, as compared to an HIV negative person who has a 10% life-time risk of developing TB disease. Thus TB mortality is influenced by the MTB/HIV co-infection which was shown out in various studies carried out in India. In India, the TB epidemic is pre-dominantly driven by the non-HIV positive TB cases. It is estimated that nearly 5% of all TB patients are infected with HIV. The periodic HIV survey in TB patients, which was carried out in 4 districts in 2005-06, was scaled up to 15 districts in 2006-07. The 2007 survey represents the most detailed evaluation to date of HIV epidemiology among TB patients in India. The survey demonstrated that the prevalence of HIV among TB patients varied substantially across the geographic regions between 1% and 13.8% across the 15 surveyed districts.(The HIV-TB Co-infection available at http://www.naco online.org) The diagnosis of TB has been based on clinical and laboratory parameters. An integral component of the World Health Organization (WHO) strategy for reducing the burden of HIV related TB disease is intensified case finding (ICF) for TB among HIV infected person. (Maher *et al.*, 2005) (World Health Organization; 2004, Intrim policy)

The aim of the present study was to estimate the number and percentage of patients co-infected with HIV-TB and it's association with age and gender was also determined at Government Medical College & Hospital, Akola in Maharashtra

Material and Methods

HIV diagnosis

This study was conducted at Government medical college & hospital, Akola in Maharashtra, over a period of eight months from April 2014 to November 2014. All newly diagnosed HIV positive patients from the Integrated Counseling and Testing Centre (ICTC) & similarly, all Acid Fast Bacilli (AFB) smear positive TB patient who were referred to ICTC were enrolled in the study. HIV testing was done by testing the serum by three ELISA/ Rapid/ Supplemental tests protocol as per the guidelines laid down by NACO. We included all the persons with documented HIV infection. Similarly patients of RNTCP OPD were evaluated for TB as per RNTCP guidelines.

Tuberculosis diagnosis

According to RNTCP case definition for TB "at least 2 initial sputum smear examination (direct smear microscopy) positive for AFB Or TB in a patient with one sputum examinationpositive for AFB and radiographic abnormalities Or TB in patient with one sputum specimen positive for AFB and culture positive for Mycobacterium Tuberculosis."(RNTCP- A manual for sensitization, Maharashtra State TB Control Society, Mumbai; 2004)

According to WHO case definition for HIV prevalent setting. "A smear positive pulmonary TB" (PTB+) case was defined as TB in a patient with (a) at least One initial sputum smear positive for acid fast bacilli (AFB) by direct microscopy (b) One initial sputum smear positive for AFB by concentrated method, or (c) One initial positive culture for Mycobacterium Tuberculosis. (World Health Organization; 2007. Recommendations for HIV- prevalent and Resource- Constrained Setting).

Sputum microscopy is the most reliable, rapid single method in diagnosis and control of Tuberculosis. Two sputum samples were

collected from each patient for smear examination. (Spot- early). New slides were used for smear preparation. Smears were prepared from the thick purulent part of the sputum. Smears were dried and heat fixed andstained by the Ziehl- Neelsen technique. Stained smears were examined under oil immersion objective. Acid fast bacilli were seen as bright red rods while the background was blue. Smears were graded depending on number of bacilli seen.

Results and Discussion

The study population consists of 184 confirmed HIV patients. The overall prevalence of co infection of MTB and HIV was 17.93% (Table 1). Out of these 21(63.63%) were males and 12 (36.36%) were females (Table 2). The prevalence of co infection also varies with age of the patient. It was highest among HIV patients aged 21-40 years(57.57%) followed by those aged 41-60 years (30.30%), 1-20 years(12.12%) (Table 3). Of total co infected patient 12 (36.36%) were laborer by occupation, 3(9.9%) were driver and remaining 16 (48.48) were working in private sector. Two patient were in pediatric age group. Out of 33 co-infected patient 22 (11.95%) were referred from ICTC to RNTCP and 11 were referred from RNTCP to ICTC. First time CD_4 count of all these patients varies from maximum 1319 to minimum 27, median value being 107.

Rate of co-infection

TB is the leading infectious killer of people living with HIV. The fight against HIV/TB remains among the higher priorities for WHO. This study demonstrated the rate of co infection from Government medical college & hospital, Akola in Maharashtra is 17.93%. This is different from other studies such as from South Africa, Cambodia Ethiopia are 7% to 10,(Day J. H. *et al.*,2006) (KimerlingM.E *et al.*,2002)(Mohammed A *et al.*,2004)(Sarita Shah *et al.*,2009), in New York 9.8%,(Friedman L. N *et al.*,1996), in Haiti 7.5%. (Pape J. W *et al.*,1993)

Table.1 HIV-TB co-infection at GMC Akola (Maharashtra) from April-November 2014

Referral	**Referral from ICTC to RNTCP**		**Referral from RNTCP to ICTC**		**TOTAL**
Total Cases	**HIV-TB Co infection**	**Percentage of HIV-TB**	**TB-HIV co infection**	**Percentage of TB-HIV**	**TOTAL**
184	22	11.95%	11	5.97%	17.93%

Table.2 Gender wise distribution of co infected patients

Referral	**Referral from ICTC to RNTCP**	**Referral from RNTCP to ICTC**		
Sex of the patients	**HIV-TB**	**TB-HIV**	**TOTAL**	**%**
MALE	14	7	21	63.63%
FEMALE	8	4	12	36.36%
TOTAL	22	11	33	100 %

Table.3 Age wise distribution of co infected patients

Referral	**Referral from ICTC to RNTCP**	**Referral from RNTCP to ICTC**	
Age	**HIV-TB**	**TB-HIV**	**%**
1-20yr	3	1	12.12
21-40yr	13	6	57.57
41-60yr	6	4	30.30
>60yr	0	0	00.00
TOTAL	22	11	100

Age and Gender Correlation

One of the study conducted Manipur, India shows co infection rate of 55% in 2005.[13]Another study conducted from Ahmednagar district of Maharashtra in 2014 shows prevalence of HIV-TB co infection of 21.59% of which 53.2% are male patient and 46.8% are female. Maximum incidence (71.43%) is found in 30-45 yr age group (Gautam L *et al.,* 2014). In our study maximum incidence is found in age group 21-40yr (Table 3) which is also sexually active age group.

The trends observed over the year's highlights the importance of continuous surveillance and in time appropriate preventive measures. The use of HAART reduces the risk of developing TB disease amongst HIV positive patients. The effect of HAART on the risk of TB disease amongst HIV positive patients has been examined in several studies. In patients given HAART, the risk of TB disease was unto 80% lower than in patients not on antiretroviral therapy. (Nahid P *et al.,* 2007) The combination of antituberculous drug and HAART reduces mortality in co- infected patients (Dheda K *et al.,* 2006). Tuberculosis and HIV co-infection remains a complex disease where there are hurdles to cross at each stage.

Screening of all HIV positive patients for TB and all HIV suspected TB positive patient as per our national programs has increased the rate of diagnosis of co infected patient helping to institute early therapeutic management of such patient and increased survival rate.

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