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STUDY TO DETECT THE CD4 COUNT AND INCIDENCE OF TUBERCULOSIS AMONG HIV PATIENTS ATTENDING A TERTIARY CARE HOSPITAL

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Abstract

Introduction: Tuberculosis is a public health challenge specially in developing countries like India. The incidence of TB HIV co-infection is gradually increasing. Due to paucity of studies in eastern India regarding the incidence of TB in HIV infected persons this study was conducted.

Materials and Methods: The study is an observational prospective study conducted on 102 HIV positive patients enrolled in ART centre of a tertiary care hospital. After taking consent detailed history and clinical examination with relevant laboratory and radiological investigations were done after fulfilling inclusion and exclusion criteria. Data was entered in excel and analysed with proper statistical methods.

Results: Most of the patients belonged to age group 25-34 years. Most of them had good immune status as per CD4 counts. Most developed pulmonary TB.

Conclusion: There is a strong association between incidence of TB and HIV infection. Early diagnosis and treatment are essential to reduce mortality and morbidity in people living with HIV.

Keywords: Tuberculosis, HIV AIDS, Mantoux test

Introduction

Tuberculosis the disease of antiquity that has long been a public health challenge in the world particularly in developing countries like India.[1] The risk of developing tuberculosis after an infectious contact has been estimated to be 5 to 15% per year in HIV infected patients.[2] The pandemic of HIV infection and acquired immuno-deficiency syndrome (AIDS) has caused marked increase in tuberculosis notifications in some countries. Because it destroys the immune system of the body HIV has emerged as the single most important risk factor for progression of dormant tuberculosis infection to clinical disease.[3] It is estimated that India had approximately 1.2 lakh new HIV infections in 2009, the 6 high prevalence states account for 39% of the cases, while the states of Orissa, Bihar, West Bengal, Uttar Pradesh, Rajasthan, Madhya Pradesh, and Gujarat account for 41% of the new infections. When we look at our state West Bengal, as per the HIV estimation in India in 2007, 10% of the total persons living with HIV/AIDS (PLHA) of the country live in West Bengal. Nonetheless, the state is categorised as a low prevalence state and their pockets of high prevalence mainly driven by subpopulations that have higher risk of exposure to HIV.[4] People living with HIV need early diagnosis and treatment of active tuberculosis. If TB is not present they should receive Isoniazid preventive therapy (IPT). The treatment should be free of charges and is not expensive for the health system of the 1.5 million people reported to newly enrolled in HIV care in 2010; just 12% (almost 1,80,000) were put on isoniazid preventive therapy. With 24% of all TB being associated with HIV, 13% of new TB cases being among people living with HIV and 22% of HIV related deaths caused by TB.[5] TB represents a serious health risk based on the aforesaid observations the present study was conducted aiming at identifying active tuberculosis among HIV infected patients over one year follow up and study search for correlation between tuberculosis and CD4 counts of these patients. There is paucity of studies in eastern India regarding the incidence of TB among HIV infected persons and to see the CD4 counts in which these infections develop.

Materials and Methods:

The study is a prospective observational study conducted over a period of one year in a tertiary care medical college in Department of pulmonary medicine in collaboration with ART Centre after taking clearance from ethical committee. The study included 102 cases of newly diagnosed HIV patients by consecutive sampling who gave consent after being enrolled at ART centre of the medical college who had positive serological test for HIV, no evidence of tuberculosis, no past history of ART intake. Patients having evidence of tuberculosis or history of anti-tubercular drug intake, patients with very poor general condition and patients already taking ART were excluded from the study. After taking consent history taking and thorough clinical examination for evidence of tuberculosis or other

opportunistic infections were performed. Laboratory investigations like ZN stain, histopathological demonstration of caseous granuloma were done and suggestive clinical profile and empirical response to anti-tubercular therapy were noted. Radiological investigations like Chest X-ray were performed as and when required. Pleural fluid and ascitic fluid analysis for tuberculosis suspect were done as and when required. The data were checked and entered into Excel sheet and analyzed with Microsoft Excel and SPSS version 19. Percentage, mean, standard deviation were calculated And chi-square test, Fisher exact test were performed where applicable.

Results:

Table 1: Distribution of study population according to age:

Age (years)	Male (%)	Female (%)
<15	2(3.4)	3(7)
15-24	5(8.5)	10(23.2)
25-34	25(42.4)	15(34.9)
35-44	22(37.3)	12(27.9)
>=45	5(8.4)	3(7)

Mean age for males is 32.8, for females is 29.56.

Table 2: Distribution of study subjects according to their initial CD4 counts:

CD4 counts/mm3	Number	Percentage
<200	17	16.7
200-349	9	8.8
350-499	54	52.9
>=500	22	21.6

Table 3: Distribution of subjects according to type of tuberculosis among affected patients:

Type of tuberculosis	Number	Percentage
Pulmonary	8	66.7
Extra pulmonary	4	33.3

Annual risk of TB is 7.1/100 P-Y

Table 4: Relationship of development of active TB and initial Mantoux reactivity:

Mantoux reactivity	TB	Non TB
Positive	7	36
Negative	5	54

Chi square value =1.46, df= 1, p=0.031

Discussion:

In this study we found that 57.8% of the total 102 patients were male and 42.2% were female mean age of the population was 32.8 which was greater than the mean age of female subjects that was 29.56 majority of the subjects were from 25 to 34 years age group followed by 35 to 44 years age group patient from less than 15 years age group 4.9% were more than 45 years old patients were 7.8% of the total study median age of male voice 34 years and that of female was 30 years it indicates that majority of the patients were in sexually active period of life. Similar results were observed in number of studies on HIV aids patients in a similar study on 87 patients In Shimla Himachal Pradesh Jayral et.at all found maled were affected more than females the most common affected age group in the study was 31 to 40 years and mean age of the patient was 34.94 years.[6] Similar results were found in study by ong et.al. where majority of the patients were of the age 35-59 years.[7] Jayral et.al. in the study found 43 patients had CD4 count less than 100 cells per microlitre, 71 had CD4 count less than 200 cells per microlitre and 16 had CD4 count more than 200 cells per microliter.[6] Another study conducted in Benin city of Nigeria by Affusim et.al. found that a total of 181 patients were found to have CD for count less than 201 and 104 patients had CD4 count between 201-499. The remaining 45 patients had CD4 count 500 and above.[8] This was similar to our study where mean CD4 count was 406.06. Out of 102 patients 54 had CD4 counts between 350-499 whereas 22 had counts more than 500. Less than 200 counts were found in 17 patients and 9 patients had CD4 count between 200-349.

During our year study 12 patients had developed active tuberculosis or of which 8 were diagnosed to be pulmonary TB AND 4 extra pulmonary TB. Annual risk of TB is 7.1/100 person years (P-Y). According to a similar study conducted at TRC Chennai Swaminathan et.al. found 24 developed TB during follow up, giving a breakdown rate of 6.9/100 person years. The attack rates were similar in tuberculin positive and negative patients.[9] There was a trend towards higher mortality in patients who developed TB compared to those who did not. Affusim et.al. conducted a study where pulmonary TB was the commonest, seen among 88 patients out of the 112 patients with both infections. The least common was disseminated TB. Fourteen patients were found to have tuberculous adenitis while 7 patients had abdominal TB. Chi square test was done to see initial Mantoux reactivity and later development of active TB. 8 Significant positive correlation was found between Mantoux positivity and TB . In our study attack rate of TB was 11.05/100 P-Y among TST positive subjects and 4.24 among TST negative subjects. Whalen et.al. found the risk of TB in controls was 3.1/100 p-y in TST negative and 3.4/100 p-y in TST positive individuals in Uganda.[10] Hawken et.al. found the risk of TB to be 8.0/100 p-y in TST positive and 2.7/100 p-y in TST negative individuals in Kenya.[11] Similarly, Mwinga et.al. also found a higher attack rate among TST positive persons compared to TST negative persons.[12] In another study conducted in Tanzania, Ngowi et.al. had shown 20 among 233 study subjects had developed tuberculosis.[13]

In our study commonest infection was lower respiratory tract infection or pneumonia, total 26 events were detected which was 38.2% of the total events. But Jayral et.al. found in their study oral candidiasis as the commonest opportunistic infection.[6]

Conclusion:

We can conclude that as the incidence of TB is increasing in general population it is more commonly seen among HIV infected people. Strong implementation of programmes is necessary to control the burden of dual infection in resource poor countries like India. It is essential that patients with diagnosed tuberculosis are screened for HIV and patients diagnosed as HIV infected be screened for TB. Detailed clinical examination is necessary to detect TB at an early stage to reduce mortality and morbidity among PLHA.

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