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Original Research Paper

Lung Manifestations in PLHIV in A Highly Prevalent State

Medical Science

KEYWORDS : HIV, Tuberculosis, Pneumonia, Prevalence, Mortality.

B Chakradhar — Postgraduate, Department of Pulmonary Medicine, NRI Medical College, Chinakakani, Guntur, Andhra Pradesh, India – 522 503

D Pragati Rao — Associate Professor, Department of Pulmonary Medicine, NRI Medical College, Chinakakani, Guntur, Andhra Pradesh, India – 522 503

ABSTRACT

Human immunodeficiency virus infection & Acquired immune deficiency syndrome (HIV / AIDS) is a disease of the human immune system caused by infection with human immunodeficiency virus (HIV). People with advanced HIV infection are vulnerable to infections called 'opportunistic infections' like tuberculosis, bacterial pneumonias, herpes zoster, staphylococcal skin infections and septicaemia. Pneumocystitis jeroveci pneumonia, toxoplasmosis & cryptococcosis can also develop. Guntur District in Andhra Pradesh had the highest number of HIV positive cases since 2012-13.

Because of its prevalence in this part of country, the incidence of HIV & the consequent opportunistic infections, a detailed study of HIV related diseases in this area was undertaken. The study may help to draw plans in reducing the mortality & morbidity in HIV patients.

INTRODUCTION:

India has the third-highest number of people living with HIV in the world with 2.1 million Indians accounting for about 4 out of 10 people infected with the deadly virus in the Asia -Pacific region, according to a United nation acquired immune deficiency syndrome (UNAIDS) report in 2013. TB accounts for 25% of deaths among People Living with HIV and AIDS (PLHIV) in India. Although only 5% of incident TB patients are HIV-infected, in absolute terms it means more than 100,000 cases annually, ranks second in the world and accounts for about 10% of the global burden of HIV-associated TB. However, HIV positivity among PLHIV varies from states /districts in the country, the proportion of HIV positive among TB patients over 10% in high HIV burden states to up to 40% in some high burden districts.

METHODOLOGY:

SOURCE: The patients in this study included both inpatients and out patients of dept of Pulmonary Medicine, ICTC & ART Centre, NRI General Hospital, Chinakakani, Guntur from October 2013 to September 2015.

INCLUSION CRITERIA :

All sero-positive HIV patients with respiratory symptoms attending Pulmonology Department, ICTC & ART Centre NRIGH are evaluated.

Subject of either sex / aged more than 12years are included.

Procedure: After fulfilling the inclusion criteria, consent for participation in this study was obtained. After obtaining the consent, a detailed proforma was filled for each patient, covering various aspects like preliminary information (name, age, sex &occupation), history of patient respiratory symptoms, past history, treatment history, family history & personal history. This was followed by detailed physical examination of the patient including general examination, examination of respiratory system & other systems. All patients were subjected to required investigations like routine blood investigations & urine examination. Sputum analysis for AFB, gram stain, culture and sensitivity & malignant Cytology, Chest radiographs, HRCT or CECT, PFT, Bronchoscopy.

Literature Survey:

Pulmonary involvement occurs in 75% of all HIV infected patients with Tuberculosis, Deivanayagam et al 2001; Ahmad and Shameem 2005, TB/HIV, a Clinical Manual 2004[1].

As the CD4 count declines to <500 cells/μL, episodes of bacterial pneumonia may be recurrent and mycobacteria other than *M tuberculosis* (eg, *M kansasii*) may occur.[1,2] At a CD4 count of <200 cells/μL, bacterial pneumonia is often accompanied by bacteremia and sepsis and *M tuberculosis* infection is often extrapulmonary or disseminated. In addition, PCP and pneumonia/pneumonitis caused by *Cryptococcus neoformans* become significant considerations. At a CD4 count of <100 cells/μL, bacterial pathogens such as *Staphylococcus aureus* and *Pseudomonas aeruginosa* and pulmonary involvement from Kaposi sarcoma or *Toxoplasma gondii* are increasingly diagnosed.[3]At a CD4 count of <50 cells/μL, respiratory diseases caused by endemic fungi (eg, *Histoplasma capsulatum*, *Coccidioides immitis*), certain viruses (most commonly cytomegalovirus), mycobacteria (*Mycobacterium avium* complex) and nonendemic fungi (eg, *Aspergillus* spp) occur.

Typical manifestations occur with higher CD4 count and atypical symptoms occur as immunity declines. Extrapulmonary Tuberculosis becomes more frequent ranging from 46% to 79%, kumaraswamy et al 2005; Sharma et al 2005.

Peter, F barnes stated that Delayed therapy of tuberculosis in HIV-infected patients at our medical center was common and was not due to atypical manifestations of tuberculosis. In most cases, delays could have been avoided if adequate number of sputum samples for acid-fast smear and mycobacterial culture had been obtained, and if empiric anti tuberculous therapy had been given to symptomatic patients in whom chest roent-genographic findings were suggestive of mycobacterial disease.[6]

RE Hirschtick, J Glassroth, MC Jordan observed bacterial pneumonia is more frequent in HIV-positive persons than in sero negative controls, and the risk is highest among those with CD4 lymphocyte counts below 200 per cubic millimeter and among injection-drug users.[7]

J Ferrer in European Respiratory Journal stated that tuberculous pleural effusions occur in up to 30% of patients with tuberculosis. It appears that the percentage of patients with pleural effusion is comparable in HIV-positive and HIV-negative individuals, although there is some evidence that HIV-positive patients with CD4+ counts <200 cells/mL are less likely to have atuberculous pleural effusion.[8]

G Madeddu, AG Fois, GM Calia, S Babudieri, V Soddu evidenced a high prevalence of respiratory symptoms and

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COPD among HIV-infected patients. HIV infection, current cigarette smoking and previous bacterial pneumonia seem to play a significant role in the development of respiratory symptoms and COPD.

Thus, our results suggest that the most at-risk HIV-infected patients should be screened for COPD to early identify those who may need specific treatment.[9]

JC WEISSLER, ANNR MOOTZ concluded that Pneumocystis carinii pneumonia (PCP) remains one of the most common opportunistic disease in AIDS patients, though its incidence on bronchoscopy has declined and empiric therapy often occurs without a specific diagnosis.

J Karp, G Profeta, PR Marantz reported adeno carcinoma of the lung in seven patients with human immunodeficiency virus (HIV) infection. They compared age, clinical findings and survival data with a sex-matched control group of HIV negative patients with adeno carcinoma of the lung. Median age of HIV-infected patients with lung cancer was lower than in control patients with lung cancer.

AC Furman, J Jacob identified 31 patients with human immunodeficiency virus (HIV) infection and lung abscess. All patients had advanced HIV disease, and the mean CD4 cell count was 17/mm3 (range, 2-50/mm3). The microbiological etiology was established for 28 patients, and the pathogens recovered were bacteria (65%), Pneumocystis carinii (6%), fungi (3%), and mixed microorganisms (16%).

RESULTS AND DISCUSSION:

There are 76 males & 24 females in this study [Figure 1]. Payam Nahid et al[10], San Francisco reported 87.9% males, Pratima Gupta et al[11] reported 71.42 % males, Mohan rani Suhadev et al[12] reported 94% males, Zuber Ahamad et al[13] reported 85% males, S K Agarwal et al[14] studied 31 cases and reported 30 males and 1 female patient. Sowmya Swaminathan et al[15] from Chennai also reported 87% male cases.

Highest number of cases in the age group from 31 – 40 (34%) [Table 1]. Because these people are more active sexually. There were No cases recorded in age groups of 71 – 80 & 91 – 100. This data is in co-relation with the studies done by Pratima Gupta et al[11].

Pulmonary Tuberculosis New cases were the highest (32%) [Table 2]. In this study also the most common opportunistic infection affecting HIV patients is tuberculosis in comparison with other pulmonary diseases that effect HIV patients. This scenario is same because the prevalence of HIV & tuberculosis is more in this area. This may be because of lack of knowledge regarding prophylaxis & treatment of these diseases & inadequate health consciousness among people in this study zone. The distribution of tuberculosis cases [Table 3] were parenchymal TB are 83%, pleural TB 10%, TB Lymphadenitis 7%. Out of 100 sero-positive HIV patients, 60 cases were tuberculosis in these 60 cases 30(50%) were new sputum positive (NSP), 20(33.3%) cases were new sputum negative (NSN), 6(10%) cases were TB Pleural effusions & 4(6.7%) cases were TB Lymphadenitis.

These findings were compared with study done by Pratima Gupta et al[11] in which they studied 27 pulmonary TB cases, out of which 11 (40.74%) were sputum positive and 16(59.24%) were sputum negative.

In our study 20% of the sero-positive HIV patients suffered from pneumonia, bacterial pleural effusion in 6%. B POLSKY, JWM GOLD, E WHIMBEY diagnosed 18 episodes of community acquired bacterial pneumonia in 13 patients among 336 with the acquired immune deficiency syndrome (AIDS) at Memorial Sloan-Kettering Cancer Center. Bacterial pathogens isolated in 16 of 18 episodes were Haemophilus influenzae in 8, Streptococcus pneumoniae in 6, group B streptococcus in 1 & Branhamella catarrhalis in 1. Eight episodes were presumed Pneumocystis jeroveci pneumonia until cultures obtained at bronchoscopy confirmed a bacterial cause, specific antibacterial therapy was curative in 16 of 18 episodes; 2 patients died.[16]

In this study of 100 sero-positive HIV patients there are 4% cases with pneumocystis jeroveci.

5% of sero-positive HIV patients suffered from COPD and 3%had asthma in this study. HIV infection, current cigarette smoking and previous bacterial pneumonia seem to play a significant role in the development of respiratory symptoms and COPD.CD Poirier, N Inhaber, RG Lalonde in american journal of 2001 stated that HIV infection is associated with immune dys-regulation primarily affecting T-cell function, whereas asthma is related to excessive T-cell activity. They compared the prevalence of asthma and related conditions among adult seropositive men with the prevalence among men of similar age drawn from the general population. Seropositive men had a significantly more frequent occurrence of wheezing (54.4 versus 21.2%), bronchial hyper-responsiveness (BHR) to methacholine (26.2 versus 14.4%), and an elevated total serum IgE (37.8 versus 25.7%).

Generally Carcinoma is rarely seen in HIV patients, only 1 case of adeno carcinoma is seen in this study, No case of Kaposi sarcoma is diagnosed in this study.

CONCLUSION:

Pulmonary tuberculosis is the most common opportunistic infection in sero-positive HIV patients in this area and 2nd common pulmonary disease being pneumonia. Other pulmonary diseases diagnosed in this study are Bacterial pleural effusions TB pleural effusions COPD, PCJ, Bronchial asthma, Bronchogenic carcinoma and Lung abscess.

Even though other pulmonary diseases are relatively rare, but they are seen in this Area. It is essential to evaluate all sero positive HIV patients for associated pulmonary diseases (both opportunistic infections & other diseases), in order to make an early diagnosis & to provide timely treatment for better quality of life & prolonged life span for people living with HIV & AIDS.

FIGURE 1: Sex Distribution

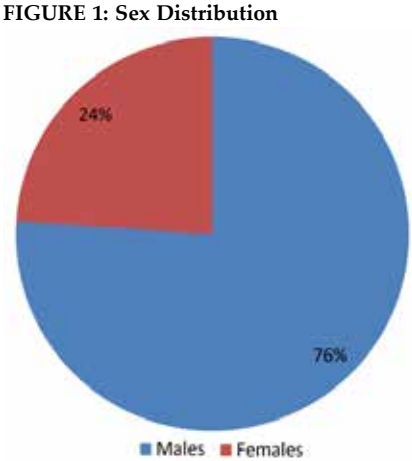


TABLE 1: Age Distribution

SL.NO	Age Distribution	No. of Cases	% of Cases
1	11 – 20	4	4
2	21 – 30	17	17
3	31 – 40	34	34
4	41 – 50	32	32
5	51 - 60	10	10
6	61 - 70	2	2
7	71 - 80	0	0
8	81 - 90	1	1
9	91 - 100	0	0

TABLE 2: Aetiology

SL.NO	Pulmonary Disease	No. of Cases	% of Cases
1	PTB New Case	32	32
2	Pneumonia	20	20
3	PTB Sequelae	10	10
4	PTB Defaulter	7	7
5	TB PLEF	6	6
6	Bacterial PLEF	6	6
7	COPD	5	5
8	TB Lymphadenitis	4	4
9	PCP	4	4
10	Bronchial Asthma	3	3
11	PTB Relapse	1	1
12	Lung Carcinoma	1	1
13	Lung Abscess	1	1

E 3: Pathological distribution

SL.NO	Types of Tuberculosis	No. of Cases	% of Cases
1	Parenchymal TB	50	83
2	Pleural TB	6	10
3	TB Lymphadenitis	4	7

REFERENCES:

1) Deivanayagam C N, Rajasekaran S, Senthilnathan V, Krishnarajasekhar R, Raja K, Chandrasekar C, Palanisamy S, Samuel Dinesh A, Jothivel G and Elango S V 2001 Clinicoradiological spectrum of tuberculosis among HIV sero-positives - a Tambaram study; *Indian J. Tuber.* **48** 123–127.
2) Burke DS, Recombination of HIV - An Important Viral Evolutionary Strategy, Emerging Infectious Diseases, 1997; 3(3): 253-259.
3) Marras TK, Morris A, Gonzalez LC, and Daley CL. Mortality prediction in pulmonary Mycobacterium kansasii infection and human immunodeficiency virus. Am J Respir Crit Care Med., 2004; 170(7): 793-798.
4) Afessa B and Green B. Bacterial pneumonia in hospitalized patients with HIV infection: the Pulmonary Complications, ICU Support, and Prognostic Factors of Hospitalized Patients with HIV (PIP) Study. Chest., 2000; 117(4): 1017-1022.
5) Richard E. Chaisson, Gisela F. Schecter, Charles P. Theuer, George W. Rutherford, Dean F. Echenberg, and Philip C. Hopewell "Tuberculosis in Patients with the Acquired Immunodeficiency Syndrome: Clinical Features, Response to Therapy, and Survival", American Review of Respiratory Disease, Vol. 136, No. 3 (1987), pp. 570-574.
6) Branes PF, Bloch AB,Davidson PT, et al. Tuberculosis in patients with human immunodeficiency virus infection. N Engl J Med 1991; 324:1644-50.
7) Robert E. Hirschtick, M.D., Jeffrey Glassroth, M.D., Matthew C. Jordan, M.S., Timothy C. Wilcosky, Ph.D., Jeanne M. Wallace, M.D., Paul A. Kvale, M.D., Norman Markowitz, M.D., Mark J. Rosen, M.D., Bonita T. Mangura, M.D., Philip C. Hopewell, M.D. Bacterial Pneumonia in Persons Infected with the Human Immunodeficiency Virus N Engl J Med 1995; 333:845-851
8) J Ferrer.Pleural tuberculosis,Eur Respir J 1997; 10: 942–947
9) G Madeddu, AG Fois, GM Calia, S Babudieri, V Soddu Chronic obstructive pulmonary disease: an emerging comorbidity in HIVinfected patientsin the HAART era. **Clinical and Epidemiological Study** Infection April 2013, Volume 41, Issue 2, pp 347-353
10) Payam Nahid Leah C. Gonzalez, Irina Rudoy, Bouke C. de Jong, Alon Unger, L. Masae Kawamura, Dennis H. Osmond1, Philip C. Hopewell, and Charles L. Daley Treatment Outcomes of Patients with HIV and Tuberculosis Am J Respir Crit Care Med Vol 175. pp 1199–1206, 2007
11) Pratima Gupta, Jagdish Rawat, Girish Sindhwani, Ramjee Prasad and Manju Talekar HIV sero-prevalence and tuberculosis in Uttaranchal, Indian J Tuberc 2006; 53:96-100.
12) Mohanarani Suhadev, Soumya Swaminathan, S. Rajasekaran, Beena E. Thomas, N. Arunkumar,M. Muniyandi and D. Meenalochani feasibility of community dot providers for tuberculosis treatment in HIV infected individuals - A pilot study, Indian J Tuberc 2005; 52:179-183
13) Zuber Ahmad, Rakesh Bhargava, D.K Pandey and K. Sharma HIV infection seroprevalence in tuberculosis patients, Ind J Tub 2003,50,151.
14) S K Agarwal,Aman Makhija , N P Singh,Anupam Prakash & U K Baveja Tuberculosis in HIV/AIDS patients in tertiary care hospital in Delhi ,Ind J Tub 2003, 50,163.
15) Sowmya Swaminathan,M Sangeetha, N Arunkumar, P A Menon, Beena Thomas, K Shibi, Ponnuraja,S Rajshekhar. Pulmonary tuberculosis in HIV positive individuals: preliminary report on clinical features and response to treatment, Ind J Tub,2002,49,189.
16) B Polsky, Jwm Gold, E Whimbey Bacterial pneumonia in patients with the acquired immunodeficiency syndrome *Ann Intern Med.* 1986;104(1):38-41