|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article Volume 3, Issue 9; September: 2019; Page No. 232-235

PLEURAL EFFUSIONS IN PATIENTS HAVING HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION/ AIDS

Nalin Joshi[1], Ramakant Dixit[2]
[1]Ex Professor, Institute of Respiratory Disease, S M S Medical College, Jaipur
[2]Professor, Department of TB & Chest Disease, JLN Medical College, Ajmer

Article Info: Received 11 August 2019; Accepted 09 September. 2019
DOI: https://doi.org/10.32553/ijmbs.v3i9.579
Corresponding author: Dr. Nalin Joshi
Conflict of interest: No conflict of interest.

Abstract
Background: Pleural effusions are common in patients with HIV infection, however; there is paucity of data on type and description of pleural effusions in HIV infected patients from countries like India where the disease is highly rampant.
Objectives/aims: Present study describes the clinical, radiological, pathological and bacteriological profile of pleural effusionsin HIV infected patients.
Methods: Patients with HIV infection having pleural effusion were subjected to detailed clinical evaluation followed by in depth diagnostic workup including radiological assessment, sputum examination, pleurocentesis, pleural fluid biochemistry, cytology, smear and/or culture for bacteria, mycobacteria, fungi, pleural biopsy, tuberculin skin testing etc.
Results: Pleural effusion was seen in 32 (22.6%) cases out of 150 patients with HIV infection.. All pleural effusions were exudates in nature. In 20(58.8%) cases, underlying pulmonary parenchymal disease was evident. Pleural effusion was more common on left side (47%). Tuberculosis was the underlying cause of pleural effusion in 28(82.3%) cases. Four (11.7%) cases had empyema thoracis.
Conclusion: Tuberculosis is the most common cause of pleural effusion in patients having HIV infection followed by bacterial pneumonia from this varies part of country.
Key words: HIV infection, pleural effusion

INTRODUCTION

Pulmonary diseases are common cause of morbidity in patients infected with human immunodeficiency virus (HIV) infection. Respiratory problems accounts for up to 70% of acquired immunodeficiency syndrome (AIDS) defining illnesses and are the cause of death in at least one third of all AIDS patients[1]. Given the multiple impairments in host defense that occur during HIV infection, patients with AIDS are at risk for a variety of pleural infection and neoplasms[2]. Causes of HIV related pleural diseases differ markedly in the developed and developing world[3-6]. In India only few studies has mention pleural effusion in HIV/AIDS[7-9]. In this regard this study highlights the types of pleural effusion in HIV infected patients for the first time from western part of the country.

Material & Methods:

Patients of respiratory diseases with high suspicion of HIV/AIDS were subjected to HIV serology after taking informed consent. One hundred and fifty of them were found to be reactive for HIV serology using different Elisa kits. Thirty four among them having pleural effusion constituted the final study group. All such patients were assessed clinically for their presenting symptoms and sign apart from other parameters. All these were subjected to following investigations- skiagram chest, computerized tomographic scan in selected cases, tuberculin shin testing, diagnostic and/or therapeutic pleurocentesis, pleural fluid analysis, pleural biopsy using Abram's pleural punch biopsy forceps etc. Other investigations conducted were sputum for acid fast bacilli (AFB) by smear/concentration method, culture for organisms, mycobacterium and fungus examination etc.

Pulmonary tuberculosis was diagnosed if clinical features were strongly suggestive of tuberculosis; sputum/pleural fluid smear for acid fast bacilli/ culture for mycobacterium tuberculosis become positive, radiological features on chest roentgenogram were compatible with tuberculosis or FNAC/biopsy showing caseating epitheloid granulomas and/ or AFB.

Results:

Pleural effusion was seen in 34 out of 150 patients that were subjected to testing for HIV infection, giving an overall incidence of 22.6%. There were 26 males and 8 females; the mean age of patients was 30.7 years. In 28 (82.3%) patients history of extra marital sex was present. Four patients gave history of blood transfusion and two patients had history of having drug abuse. 28 out of 34 (82.3%) patients were belonging to lower socioeconomic group.

On clinical assessment, 16 (47%) patients were suffering from illness for not more than 3 months. In 14 (41.1%) patients the average duration of illness was between 4 to 6 months. Fever (47%) and weight loss (41.1%) were the commonest general symptoms followed by night sweat and joint pain (11.7%). Among the respiratory symptoms cough (76%), chest pain (52.9%) and shortness of breath (52.9%) were commonly seen.

Pleural fluid smear and/ culture for AFB/Mycobacterium tuberculosis were positive in 14(41.1%) cases and in 20(58.8%) cases these were negative. Pleural biopsy was performed in 20(58.8%) cases that on histological examination showed features consistent of tuberculosis in 14(70%) and non specific inflammatory reaction in 6 (30%) cases. In 14 cases, pleural biopsy could not be performed in view of minimal pleural effusion or lack of consent.

On radiological assessment, pleural effusion was evident in 32(94.1%) and pneumothorax in two cases. Among two cases of pneumothorax, one patient had sequential bilateral pneumothorax, first on right side and then on left while another one had pneumothorax on right side with underlying COPD. Pleural effusion was left sided in 16(47%) patients, right sided in 10(29.4%) and bilateral in six (17.6%). Of the 16 cases of left sided pleural effusion, in 4 cases it was massive empyema thoracis. In one case of bilateral pleural effusion also, there was a moderate empyema thoracis on right side and pleural effusion with refilling on left side. Pericardial effusion with cardiomegaly was also seen in two cases of bilateral pleural effusion.

Underlying pulmonary parenchymal disease was evident in 20(58.8%) cases. Among them, patchy infiltrates were seen in 10(29.4%) cases, cavitary lesions in 6(17.6%), and miliary shadows in 4(11.7%). In 14(41.1%) cases no underlying parenchymal disease could be detected on chest x-ray. Tuberculosis was the underlying cause of pleural effusion in 28(82.3%) patients. Non tubercular empyema thoracis was observed in four (11.7%) cases that on further investigations were found to be due to Klebsiella, Citrobacter species and streptococcus faecalis in one case each. In one case, no definite organism could be identified.

Discussion

Although progressive depletion of CD4 lymphocytes is an immunogenic hallmark of HIV infection, multiple impairment in host defense occur in the lungs of HIV infected individuals, making them susceptible to a variety of infectious and neoplastic processes[10].The studies reported from developed countries has contrary those from developing countries in the perception of the occurrence of pleural disease in HIV infected patients commonly interrelated with the incidence of causal pulmonary infections and neoplasm's [3-6].

In this series, the incidence of pleural effusion was 21.3% while this has been reported to be 27% at United States[3], 24% at Harare[11], 18.7% at Madras[9], 14.6% at Florida[12], 13.7% at Pondicherry[7], 8% at Vienna[4] and 4.6% at Bombay[8].

Pleural effusion in HIV infected individuals is caused by a variety of pleural infections and neoplasm. Of the infectious causes, bacterial parapneumonic effusions, empyema and tuberculosis pleuritis occurs more frequently than the effusions caused by Pneumocystis carinii[2]. Rarely these can be due to Cryptococcal infection[13], histoplsmosis[14], disseminated candidiasis[7] etc. Malignant pleural effusions in HIV infection are frequently associated with Kaposi's sarcoma followed by non Hodgkin's lymphoma. Other causes of pleural effusions in HIV co infected individuals are hypoalbuminemia causing transudative pleural effusion[3], HIV related dilated cardiomyopathy with left ventricular failure and renal failure[15, 16]. In one series pancreatitis was the fifth leading cause of pleural effusion in patients with AIDS[12]. In our series, 82% cases were due to underlying tuberculosis similar to the reports from Rawanda[6] and Pondicherry[7]. Whereas tuberculosis contributed 8% cases in United States[3], 15% in French series[5] and 21% from Vienna[4], reflecting the high case rate of tuberculosis in the developing countries. We could not find any case due to neoplastic process or heart failure in this study.

Tuberculosis pleural effusions are usually immune phenomenon. The entry of small numbers of Mycobacterium tuberculosis organisms from sub pleural pulmonary parenchymal foci results in an inflammatory reaction in the pleural space of a previously sensitized host[17]. This might be the reason that HIV infected individuals with CD4 counts greater than 200/mm3 are more likely to present with tubercular pleurisy, reflecting that pleurisy requires intact immunity[18]. In our series also 2/3rd of the patients were having normal CD4 counts.

Pleural fluid characteristics of tubercular pleural effusion in HIV infected individuals include turbid or serosangunious appearance, exudative chemistries and mean WBC counts of about 4000 cell/µl[19]. About 2/3 of such effusions are lymphocytes predominant and a third are neutrophil predominant. Pleural fluid culture are positive in more than 90% of cases with smears positive in only a few percent; however pleural biopsy tissue show positivity in up to 75% of reported cases[20]. In the present study all effusions were found to be exudates on fluid biochemistry. AFB were demonstrable in pleural fluid smear and /or culture in 41% cases similar to 40% cases in Spain[21] and slightly less compares to 53% cases from New York[20]. Pleural biopsy showed features suggestive of tuberculosis in 70% cases where it was performed while it was reported in 88% cases in New York[20] and only 42% in Spain[21]. The granulomas on pleural biopsy are less well formed in some patients with HIV-positive with numerous AFB reflecting the degree of immunesuppression[22].

HIV diseased persons have commonly development of empyema or parapneumonic effusions. Streptococcus pneumonia, Staphylococcus aureus and gram negative bacilli including pseudomonas[23, 24] are common pathogen compared to other less reported pathogens such as Rhodococcus aqui[25] etc. We observed four such cases; however the identified pathogens among three were Klebsiella, Citrobector and Streptococcus faecalis. Although the distribution of organisms responsible for parapneumonic effusion in HIV infected individuals is similar to those without HIV, the empyema in HIV with less CD4 count in more complex and often requires open decortications and drainage[26].

In conclusion, this study highlights pleural effusion in 1/5th of cases having pulmonary disease with HIV infection/AIDS. Tuberculosis pleural effusion and pleurisy are the most common type of pleural effusion in such patients even in the absence of marked immune suppression. Like in Rwanda[6], pleural effusion should be considered as a marker of tuberculosis as well as HIV infection in our country that is also facing this lethal association at an alarming speed.

References:

1. Chan ISF, Neaton JD, Saravolatz LD, et al. Frequencies of opportunistic diseases prior to death among HIV infected persons. AIDS 1995; 9: 1145-51.
2. Beck JM. Pleural diseases in patients with AIDS. Clin Chest Med 1998; 19: 341-49.
3. Joseph J, Strange C, Sahn A. Pleural effusions in hospitalized patients with AIDS. Ann Intern Med 1993; 118: 856-59.
4. Armbruster C, Schalleschak J, Vetter N, et al. Pleural effusions in HIV infected patients: co relation with concomitant pulmonary disease. Acta Cytol 1995; 39: 698.
5. Cadranel JL, Chouaid C, Denis M, et al. Causes of pleural effusion in 75 HIV infected patients. Chest 1993; 104: 655.
6. Batungwnayo J, Taelman H, Allen S, et al. Pleural effusion: Tuberculosis and HIV-1 infection in Kigali, Rawanda. AIDS 1993; 7: 73-79.
7. Arora VK, Gowrinath K, Panda BN. Pleural effusion in HIV infection-clinico radiological profile and prognostic significance. Indian J Chest Dis Allied Sci 1994; 36: 113-17.
8. Mohanty KC, Bashir PM. Changing trends of HIV infection and tuberculosis in a Bombay area since 1988. Indian J Tuberc 1995; 42; 117-20.
9. Thanasekaran V, Krishnarajasekar OR, Madhavi S, et al. Pulmonary disease in HIV infected patients. Lung India 1994; 12: 123-28.
10. Newbury RL, Beck JM. Pulmonary immunology in HIV infected individuals. Semin Respir Crit Care Med 1995; 16: 161-72.
11. Houston S, Ray S, Mahari M, et al. The association of tuberculosis and HIV infection in Harare, Zimbabwe. Tubercle Lung Dis 1994; 75: 220-26.
12. Afessa B. Pleural effusion and pneumothorax in hospitalized patients with HIV infection: the pulmonary complications, ICU support and prognostic factors of hospitalized patients with HIV infection(PIP) study. Chest 2000; 117: 1031-37.
13. Katz AS, Niesenbaum L, Mass B. Pleural effusion as the initial manifestation of disseminated cryptococcosis in AIDS- Diagnosis by pleural biopsy. Chest 1989; 96: 440-41.
14. Marshall BC, Cox JK Jr, Carroll KC, et al. Histoplasmosis as a cause of pleural effusion in AIDS. Am J Med Sci 1990; 300: 98-101.
15. Hielman RB, Chunng WS, Chernoff DN, et al. Cardiac manifestation of HIV infection: a two dimentional

echocardiographic study. Am Coll Cardiol 1989; 13: 1030-36.

16. Light RW. Pleural effusion due to acquired immunodeficiency syndrome, other viruses, mycoplasma pneumonia and rickettsiae. Pleural Diseases; 6th edition. Philadelphia: Lippincott Williams & Wilkins; 2013: pp 277-86.

17. Beck JM. Immunologically mediated pleural effusions. Semin Respir Med 1991; 12; 238-41.

18. Jones BE, Young SMM, Antoniskis D, et al. Relationship of the manifestations of tuberculosis to CD4 counts in patients with HIV infection. Am Review Respir Dis 1993; 18: 1292-97.

19. Frye MD, Pozsik CJ, Sahn SA. Tuberculosis pleurisy is more common in AIDS than in non-AIDS patients with tuberculosis. Chest 1997; 112: 393-97.

20. Ralkin F, Aranda CP, Garay SM, et al. Pleural tuberculosis and HIV infection. Chest 1994; 105:1338-41.

21. Gil V, Cordero PJ, Grese JV, Soler JJ. Pulmonary tuberculosis in HIV infected patients. Chest 1995; 107: 1775-76.

22. Luzze H, Elliot AM, Joloba ML, et al. Evaluation of suspected tuberculous pleurisy: clinical and diagnostic findings in HIV-1 positive and HIV-1 negative adults in Uganda. Int J Tuberc Lung Dis 2001; 5: 746-53.

23. Pena GN, Alfageme MI, Munoj MJ, et al. Thoracic empyema in HIV infected patients: microbiology, management and outcome. Chest 1998; 113: 732-38.

24. Kielhofner M, Atmar RL, Hamill RJ, et al. Life threatening pseudomonas aeruginosa infection in patient with HIV infection. Clin Infect Dis 1992; 14: 403-22.

25. Calore EE, Vazquez CR, Perez NM, et al. Empyema with malakoplakic like lesions by rhodococcus equi as a presentation of HIV infection. Pathologica 1995; 87: 525-27.

26. Khwaja S, Rosenbaum DH, Paul MC, et al. Surgical treatment of thoracic empyema in HIV infected patients: severity assessment and mortality is associated with CD4 counts status. Chest 2005; 128: 246-49.