Human Immunodeficiency Virus and Pneumothorax: A retrospective study of 21 patients

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ABSTRACT

HIV is a growing pandemic threatening world with disease itself and opportunistic diseases it causes. Pneumothorax is a medical emergency seen in causalities, ICUs and wards. Bacterial infections Tuberculosis, PCP pneumonia are the most common infections encountered in HIV seropositive individuals that may result in pneumothorax. Here there is a retrospective study of 21 HIV seropositive patients who attended casualty with pneumothoraces. The cases studied were diagnosed to have pneumothorax clinically and radiologically. Most common cause of pneumothorax in these HIV seropositive individuals was tuberculosis followed by pneumocystis infection.

Keywords: HIV seropositivity, Pneumothorax, Tuberculosis

Introduction

Pneumothorax is a frequently encountered medical emergency in Respiratory Medicine. Spontaneous pneumothorax occurs 450 times more frequently in patients with acquired immunodeficiency syndrome (AIDS) versus the general population and is now the leading cause of non traumatic pneumothorax in the urban population, to include both those with and without AIDS (1). The incidence of spontaneous pneumothorax in human immunodeficiency virus (HIV)-seropositive individuals is estimated to be about 2-5% of overall total cases (2).

Aims and Objectives

To know the cause of Pneumothorax in HIV seropositive individuals.

Material and Method

A Hospital based retrospective observational study, conducted at Department of Pulmonology, Siddhartha Medical College; Vijayawada was done for a period of 18 months. All cases were collected consecutively and analysed on a excel sheet and descriptive statistics applied wherever necessary. All the patients studied in the group gave valid informed consent. The study group patient were thoroughly examined and subjected to radiological investigations. Then diagnosed cases were further subjected to further routine investigations and treatment was initiated with intercostal tube drainage. Investigations done were Chest x-ray, sputum for AFB, Sputum for culture and sensitivity, Pleural Fluid Analysis for sugars, protein, and ADA (Adenosine Deaminase Enzyme) .Treatment follow-up, complications encountered were also recorded and reported.

Results

There were 10 males and 11 females in the study group. There were 11(52.4%) females and 10 (47.6%) males in the study. There were 4 males and 8 females below the age group of 40 and 6 males and 3 females above the age of 40 years. Pneumothorax was left sided in 8 cases (38.1%) and right sided in 12 (57.4%) and one case (4.7%)showed bilateral disease. There were 7 cases of pneumothorax (2 were right sided ,4 were left sided and one bilateral),7 cases of hydropneumothorax (5 were right sided and 2 were left sided)and 7 cases of pyopneumothorax (5 right sided and 2 left sided).Most of the patients were suffering from shortness of breath,dry cough chest pain and haemoptysis.There was habit of smoking in 6 males and 1 female. Six patients were suffering from diabetes (males-2 and females -4).Hypertension in two males and two females. There was history of Tuberculosis and use of Antituberculosis treatment in 4 males and 6 females. Sputum for Acid fast bacilli showed positive in 13 patients (males-6 and females-4).

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Table No.1: Age and sex distribution(n=21)

	Males	Females	Total
<40 years age	4 (19%)	8 (38.1%)	12 (57.14%)
>40 years age	6 (28.6%)	3 (14.3%)	9 (42.86%)
total	10 (47.6%)	11 (52.4%)	21 (100%)

Table No.2: Sputum for AFB in HIV seropositive and (n=21)

	Males	females	Total
Sputum for AFB Positive	6 (28.57%)	7 (33.33%)	13 (61.9%))
Sputum for AFB negative	4 (19.04%)	4 (19.04%)	8 (38.1%)
Total	10 (47.61%)	11 (52.38%)	21 (100%)

In the study period, the treatment was given with Intercostal tube drainage, appropriate antibiotics. The Anti tuberculosis treatment was started as sputum reports. Six patients in the study group had total lung expansion (3-male and 3-female). Five patients had total lung expansion with pleural thickening (2-males and 3- females) Four cases (1-male and 2 –female) had expansion with pleural fibrosis. Two patients suffered from bronchopleural fistula .Two cases absconded and two cases expired during the study. The cause of pneumothorax in these 21 HIV seropositive individuals was tuberculosis in 15 cases, PCP in 4 cases and two cases had bacterial pneumonia.

Table No: 3 Showing aetiologies in the study group (n=21)

S.No	Aetiology	Number of patients
1	Tuberculosis	15(71.45%)
2	PCP	4(19.05%)
3	Bacterial pneumonia	2(9.5%)
4	Total	21 (100%)

Discussion

The occurrence of PTX in HIV-infected patients was first reported in 1984 [3]. The aetiology of spontaneous pneumothorax in HIV patients seems to be related to the patients risk practices and to their degree of immunosuppression. Pneumothorax in immunocompromised is usually have documented pulmonary infection (4). Bacterial pneumonia and pulmonary tuberculosis can cause spontaneous pneumothorax in patients with HIV Infection (5). The incidence of active or old tuberculosis infections among HIV-seropositives with pneumothorax is estimated to be from 15% (2) to 30%, depending the immune status of HIV-infected patients. The HIV and tuberculosis co-infection has come to be known as a deadly duet, a difficult and frequently fatal combination. Tuberculosis is the most common opportunistic infection in HIV infected persons in several countries, including India. Twenty-five to 65% of HIV infected persons have been reported to have active tuberculosis of one organ or the other in developing countries (6). In the present study seropositive patients with Tuberculosis were accounting to 71.45%.In our study 21 seropositive 13 patients showed sputum for AFB positivity, 6 were males and 7 were females. 2 more cases were diagnosed to have pulmonary tuberculosis (sputum negative for AFB) based on radiological findings and other investigations.

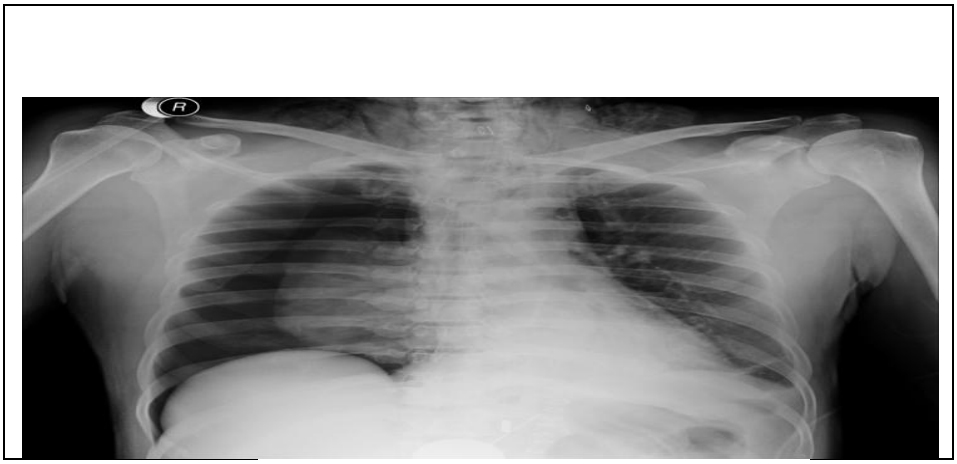

Fig 1: Chest x-ray showing Right Pneumothorax

Pneumothoraces in miliary Tuberculosis could have occurred during chemotherapy also (7). In the present study there were 3 cases of miliary tuberculosis co infected with HIV presenting as pneumothorax.The aetiology of spontaneous pneumothorax in HIV patients seems to be related to the patients risk practices and to their degree of immunosuppression. Thus, the most common cause among intravenous drug users and in patients with a CD4+ lymphocyte count of more than 200 cells/mL is bacterial pneumonia, and on the other hand, among sexually transmitted HIV-infected individuals and those with less than 200 cells/mL or with AIDS is *Pneumocystis jiroveci* infection (2).Four cases in the study were diagnosed to have pneumocystis jiroveci pneumonia (19.05%).The cases were diagnosed as PCP based on clinical features like non-productive cough, dyspnoea and radiological features showing cavitations who were already seropositive for HIV at the time of diagnosis. The sputum samples collected under aseptic conditions were sent to Microbiological Laboratory for Grocott-Gomori's Methanamine Silver staining for confirming PCP diagnosis. Pneumothorax in HIV seropositive individual should always raise suspicion of PCP. Pneumocystis jiroveci pneumonia is a common opportunistic infection affecting immunosuppressed patients and previous or active Pneumocystis infection appear to be a risk factor for developing of pneumothorax. Among radiological findings of Pneumocystis jiroveci pneumonia are cysts, pneumatoceles and spontaneous pneumothoraces (8).

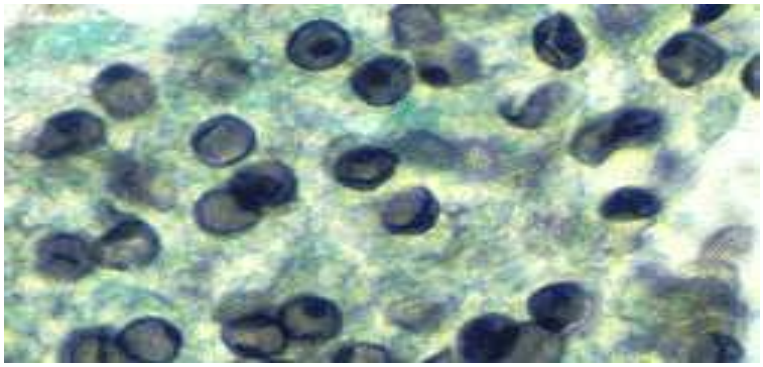

Fig 2: Grocott-Gomori's Mehanamine silver stain Pneumocystis carnii

Clinical presentation of HIV infected subjects with bacterial pneumonia, was similar to that of HIV-seronegative patients with community acquired pneumonia. The onset was acute or subacute with fever, cough, purulent sputum, dyspnoea, chest pain. The physical examination reveals, abnormalities like crackles. These patients in due course of illness can go into secondary spontaneous pneumothorax, which could be life threatening.As concurrent HIV infection increases the susceptibility to bacterial and other opportunistic infections, many of these lung infections can be implicated to the development of pneumothorax in HIV-infected individual as causes of pulmonary cavitation. Among bacterial infections as causes of spontaneous pneumothorax in HIV-seropositives has been reported necrotizing pneumonias caused by *Pseudomonas aeruginosa , Salmonella spp. , Staphylococcus aureus and Streptococcus pneumonia* .In present study there were only two cases (9.5%)which were pneumothorax in HIV seropositive individuals who showed streptococcus pneumonia on sputum for culture and sensitivity.

Conclusion

The most common cause of pneumothorax in HIV seropositive individuals was found to be tuberculosis in our study followed by Pneumocystis carnii Pneumonia and Bacterial Pneumonia.

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