Annals of African Medicine
Vol. 4, No. 1; 2005: 7 – 9

RADIOGRAPHIC FEATURES OF PULMONARY TUBERCULOSIS AMONG HIV PATIENTS IN MAIDUGURI, NIGERIA

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Key words
HIV, pulmonary tuberculosis, radiographic features, Nigerians

Abstract

Background: Tuberculosis infection may develop at any stage of HIV infection. Pulmonary tuberculosis produces a broad spectrum of radiographic abnormalities among HIV patients.

Method: A cross-sectional study of the radiographic features of pulmonary tuberculosis in 60 consecutive confirmed HIV-seropositive patients aged between 18 and 55 years (Mean ± SD: 33.9 ± 8.42) comprising of 34 males and 26 females. Chest x-rays were evaluated for the presence of apical opacities with or without cavitation (typical) or miliary, lower or mid-zone and reticulonodular opacities, pleural effusion, hilar adenopathy and normal radiograph (atypical).

Results: The commonest clinical manifestation was productive cough (100%). Oral thrush (87%), weight loss (83%), night sweats (78%), fever (75%), chest pain (50%) and herpes zoster (5%) also occurred in the patients. Normal radiographs constitute the commonest radiographic finding and were seen in 15 (25%) patients. Hilar adenopathy was noted in 5 (8%) patients. Pleural effusion was seen in 10 (16.7%) patients (mean 194.5 ± 82.9/μl). Lower/mid-zone and reticulonodular opacities occurred in 7 (11.6%) and 2 (3%) patients respectively.

Conclusion: Majority of patients in our study had normal chest radiographs. Absence of changes in chest radiographs should not exclude the diagnosis of PTB.

Mots clés
VIH, la tuberculose pulmonaire, les caractéristiques radiographiques, Nigérians

Résumé

Fond: L'infection de tuberculose peut se développer à n'importe quelle étape de l'infection par le HIV. La tuberculose pulmonaire produit un large éventail des anomalies radiographiques parmi des patients d'VIH.

Méthode: Une étude transversale des dispositifs radiographiques de latuberculose pulmonaire dans 60 malades de VIH-séropositifs consécutifs et confirmés âgés entre 18 et 55 ans (moyen ±: 33.9 ± 8.42) comportant de 34 mâles et de 26 femelles. Des radiographies de la poitrine ont été évaluées pour la présence des opacités apicales avec ou sans la cavitation (typique) ou miliaire, bas ou mi-zone et opacités reticulonodulaires, effusion pleurale, adénopathie hilar et radiographie normale (atypiques).

Résultats: La manifestation clinique la plus commune était la toux productive (100%). La grive oral (87%), la perte de poids (83%), les sueur de la nuit (78%), la fièvre (75%), la douleur de poitrine (50%) et zoster d'herpès (5%) se sont également produits dans les malades. Les radiographies normales constituent la conclusion radiographique la plus commune et ont été vues dans 15 (25%) malades. Adénopathie de hilar a été noté dans 5 (8%) malades. L'effusion pleurale a été vue dans 10 (16.7%) malades (± 82.9/ de moyen 194.5ml). Bas/ mi-zone et des opacités reticulonodulaires se sont produites dans 7 (11,6 %) et 2 (3%) malades respectivement.

Conclusion: la Majorité de malades dans notre étude avait les radiographies

de poitrine normales. L'absence de changements dans les radiographies de poitrine ne doit pas exclure le diagnostic de PTB.

Introduction

The recent increase in the prevalence of tuberculosis (TB) globally, particularly in Africa has been attributed to the increase in number of human immunodeficiency virus (HIV)-infected patients.[1, 2] There is rising incidence of TB, especially pulmonary TB (PTB) in HIV-infected patients as well as a high rate of HIV in patients suffering from tuberculosis in Nigeria and other parts of the world.[3] The reported HIV-seroprevalence rates among TB patients in Nigeria range between 5.3% and 36%, [4-7] whereas the reported HIV-seroprevalence rates range between 12% and 55% in Africa and 39% worldwide.[8]

The clinical manifestations of PTB are productive cough, oral thrush, weight loss, night sweats, fever, chest pain and herpes zoster.

Tuberculosis infection may develop at any stage of HIV infection.[3] Pulmonary tuberculosis produces a broad spectrum of radiographic abnormalities among HIV patients. These include consolidation of the middle or lower lobe or anterior segment of the upper lobe, cavitation, pleural effusion, hilar and mediastinal adenopathy, miliary disease and a normal chest radiograph in the primary phase of the disease .[4, 5,9] Typical lesions are seen in post-primary TB, these include upper lobe fibrosis, consolidation and cavitation. [,9,10]

The aim of the study was to document the radiographic features of pulmonary tuberculosis among HIV-positive patients in Maiduguri, northeastern Nigeria.

Materials and Methods

This was a cross-sectional study carried out at the University of Maiduguri Teaching Hospital, Maiduguri, Nigeria from September 2001 to August 2002. A total of 60 consecutive patients with sputum smear positive pulmonary tuberculosis, positive for HIV antibodies as detected by enzyme-linked immunosorbent assay (ELISA) (Genscreen HIV1/HIV2 version 2. Sanofi-Pasteur) and confirmed by immonocomb II (IMMUNOCOMBFIRM) (HIV1/HIV2 combfirm Orgenics) were studied.

Patients on immunosuppressive therapy, antiretroviral therapy longer than one week, antituberculous therapy for more than one month and those who denied consent as well as patients with diabetes mellitus, chronic renal failure, nephrotic syndrome, sickle cell disease and widespread malignancies were excluded from the study.

Standard posteroanterior chest radiographs were obtained with film-screen at 90–140 KVp in all patients. All films were reviewed independently by two consultant Radiologist. The data obtained were analyzed using SPSS version 11.0.

Results

Thirty four males (56.7%) and 26 females (43.3%) were enrolled into the study. The age range was 18 - 55 years with a mean (± SD) of 33.9 ± 8.42 years and median of 33 years.

Table 1. Clinical features of 60 patients at presentation

Clinical features	No. (%)
Cough	60 (100)
Sputum production	60 (100)
Oral thrush	52 (87)
Weight loss	50 (83)
Night sweats	47 (78)
Lymphadenopathy	46 (77)
Fever (T>37.4^{o}C)	45(75)
Chest pain	30 (50)
Pruritic Dermatitis	15 (25)
Haemoptysis	6 (10)
Herpes Zoster	3 (5)

Table 2. Chest x-ray findings among 60 patients with HIV-related pulmonary tuberculosis

Radiographic features	No.	%
Normal	15	25
Miliary opacities	12	20
Pleural effusion	10	16.7
Apical opacity ± cavitations	9	15
Lower/mid zone opacity	7	11.7
Hilar adenopathy	5	8.3
Reticulo-nodular opacities	2	3.3

The major clinical features at presentation are shown in table 1. The duration of symptoms prior to presentation ranged from 3 weeks to 8 months. Using the 1993 CDC Surveillance Case Definition of AIDS, [16] 26 of the patients were in category C3, 32 in C2 and only 2 in C1.

The distribution of radiographic features of PTB is shown in table 2. Normal radiographs constitute the highest number of patients (25%), followed by milliary opacities in 20%. Reticulonodular opacities (3.3%) and hilar adenopathy (8.3%) were the least radiograghic features seen.

Discussion

The mean (± SD) age of the patients in this study is similar to the observations of other workers [11 - 13] and Hsieh *et al*[14] in Taiwan who reported a similar

age distribution among HIV–associated PTB patients. This corroborates the fact that HIV is more common in people in their productive and sexually active age groups.[15] The male: female ratio of 1.3: 1 shows the near unity in sex distribution of HIV infection in Nigeria. However, it differs from the findings of other workers in other parts of the world[16] and Nigeria[11 - 13] who reported male preponderance. This may be due partly to time difference between this and other studies. However, polygamy in this part of Nigeria, early female marriages, freedom to remarry after divorce or death of a spouse might have contributed to this disparity.

The chest X-ray findings in this study are similar to those of Awoyemi et al [17] in Ibadan. However, the higher rates of normal radiographs in our patients may be related to immune status, as immunosuppressed patients may not mount adequate immune response to *M. tuberculosi*s. The finding of normal chest radiograph in our HIV-related PTB patients is similar to others. [4, 16, 18, 19]

Kawooya et al [9] reported a prevalence of 98.7%, 43.3%, 41.3%, 25.3% and 2% for lung opacities, cavitation, lymphadenopathy, pleural effusion and miliary pattern, respectively among HIV-seropositive patients studied in Uganda. These high rates may be accounted for by other conditions like diabetes mellitus, malnutrition and other infections as well as environmental socio-economic factors which also cause immunosuppression – a factor they have in common with HIV. Similarly, Woodring et al [20] in their series found a prevalence of 37.5%, 25%, 3.1%, 6.2% and 17.2% for consolidation, cavitation, military, adenopathy and pleural effusion, respectively. This study included only patients that were non-immunocompromised which may explain the low rates of military pattern.

Majority of patients in our study had normal chest radiographs. Absence of changes in chest radiographs should not exclude the diagnosis of PTB.

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