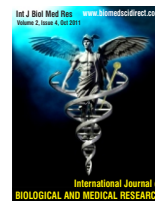


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### Original Article

# Prevalence of Tuberculosis among HIV/AIDS Patients In Obafemi Awolowo University Teaching Hospital Complex Oauthc, ILE -IFE

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#### ABSTRACT

In this study, the prevalence of Tuberculosis (TB) among HIV/AIDS patients in Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) Ile-Ife was investigated. In addition, the comparison between microscopical and radiological techniques of TB diagnosis was studied as well as the specimen of most diagnostic value. Out of 86 confirmed Acquired Immunodeficient Syndrome (AIDS) patients examined microscopical with Ziehl Neelson (ZN) cold staining method for Acid Fast Bacilli (AFB) in sputa, were positive for AFB showing a prevalence of 13.8%. the prevalence of TB in AIDS patients with regards to age group and sex distribution showed the highest number of positive cases to be in age group 21-30 yr (5.8%), males made up of 7 (8.1%) and females 5(5.8%). The radiological technique proved more sensitive with 52 (60%) positive cases than the microscopic technique with only 12 (13.9%). In the study of the most valuable specimen, early morning specimens (Collection samples) were of more diagnosis value than others (collected at the clinic between 9am 12 noon) and gave the highest positive result of 13.9% while samples I and III were 10.5% and 9.3% respectively. The high proportion of negative results (86%) obtained from microscopic examination underscores the need for cultural method and clinical diagnosis to accurately identify and confirm TB in HIV/AIDS patients who are sputum negative but may be co-infected. This work confirms that there is a close link existing between active tuberculosis and HIV/AIDS infection in Ile-Ife, Nigeria. This calls for urgent need to always screen HIV carriers for TB and recommend preventive therapy to stop latent TB developing into active form as advocated by the UNAIDS (WHO)

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### 1. Introduction

Since 1986, when the first case of AIDS was reported in Nigeria[1] the number of reported cases of HIV infection have increased remarkably and it has now been identified in all parts of the country. Coincidentally, in the last few years, reported cases of pulmonary tuberculosis in Nigeria have been on the increase and it constitutes a very serious national and public health problem[2,3].

The prevalence of TB in HIV/AIDS patients is a dual epidemic problem of major concern worldwide more so in Sub-Saharan Africa where there is upsurge of the disease. The World Health

Organization (WHO) estimated that 4.4 million people have dual infections with the tubercle bacillus and HIV in the world [4,5] and almost 80% of these people reside in Africa [4,6]. One third of all people living with HIV/AIDS (PLWHA) worldwide are co-infected with Mycobacterium tuberculosis (the germ that causes TB) [2]. HIV is making the TB epidemic significantly worse and has been reported to the single important factor determining the increase number of TB cases [7]. A person with HIV is up to thirty times more likely to develop active TB than a person with healthy immune system. HIV infection is the highest risk factor so far identified which increase the chance of latent infection with tubercle bacilli progressing to active TB [4,8,9] and the risk of active TB in a co-infected person is estimated to be 7-10% per year[8].

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TB shortens the lives of people with HIV/AIDS by between six months and two years and is the only major AIDS-related opportunistic infection to pose this kind of risk worldwide. According to IUATLD [10] report, 10% of persons infected by the tubercle bacilli develop TB during lifetime while 10% of HIV-Positive individuals infected with M.tuberculosis have a 20 fold higher chance of developing tuberculosis than their HIV-negative counterparts [11].

Although numerous data and reports are available from other countries, especially from the developed world, the available data in the Nigerian population is limited [12] and the magnitude and nature of the association also varies in different locations and ethnic groups [13-15]. In various surveillance studies, HIV seroprevalence rates in TB patients range from 10-80% depending on local HIV prevalence rate and the types of patient studied [16-18]. In Africa, it is reported that 25-80% of TB patients are also HIV positive [19].

This present study is therefore timely since it is undertaken to determine the prevalence of TB cases among HIV/AIDS patients attending clinics at Obafemi Awolowo University Teaching Hospital Complex (OAUTHC), Ile-Ife, Nigeria. It is believed that this will assist the clinicians in the management of TB/HIV related cases in this community and environs.

## 2. Material and Method

A total of 86 HIV/AIDS patients made up of inpatients and outpatients at the Obafemi Awolowo University Teaching Complex (OAUTHC) Ile-Ife between January 2008 and July 2009 constituted the group for this study. Informed consent was obtained from all patients who cooperated to provide sputum samples for screening for tuberculosis. A complete biodata of each patient was obtained with the aid of a form designed to include age, sex, occupation, marital status, address, and religion. Other information sought and obtained were date and time of specimen collection.

Spot samples were collected under the TB laboratory supervisor and patients were instructed on how to collect the early morning (collection) samples. Each sample was examined to ensure that it was sputum and not saliva.

The World Health Organization (WHO) procedure for diagnosis of TB at the district level was adopted for this study [20]. The sputum samples were handled in a class I safety cabinet. Sputa accepted were purulent, opaque or greenish in appearance. Samples that were heavily blood stained (clots) were treated with Sodium hypochloride to lyse the clots and concentrated by centrifugation subsequently freeing the bacteria ready for staining. Smears from resultant deposits were screened for acid fast bacilli (AFB) by the Ziehl-Neelsen (Zn) method using cold technique called Lapeyssonnic and Pausse technique and examined with oil immersion using binocular light microscope.

The patients had undergone chest X-ray with the use of radiologic technique in the X-ray department. The chest X-ray results were obtained, analyzed and compared with the microscopy results.

## 3. Result

This project revealed the prevalence of TB in HIV/AIDS patients in OAUTHC, Ile-Ife. Among 86 confirmed seropositive HIV/AIDS

patients examined, 12 were positive for Acid Fast Bacilli (AFB) showing a prevalence rate of 13.9% pulmonary tuberculosis in HIV/AIDS patients (Table 1). The age and sex distribution of the patients are shown in table 1 and the mean age of patients with HIV/AIDS was 22.9 (approx 23). Among the HIV/AIDS patients that were positive for TB, 7 (58.3%) were males and 5 (41.7%) were females.

**Table 1: Age and sex Distribution in this study**

Age Group (Yrs)	HIV/AIDS Positive Patients (N)	HIV/AIDS Patients Positive for TB (N)	Percent %	Positive Males N (%)	Positive females N(%)
0-11	0	0	0		
12-20	12	1	1.2	1(100%)	-(0%)2
21-30	26	5	5.8	3(60%)	(40%)1
31-40	18	3	3.4	2 (66.7%)	(33.3%)1
41-50	20	2	2.3	1 (50%)	(50%)1
51+	10	1	1.2	-(0%)	(100%)5
Total	86	12	13.9	7 (58.3%)	(41.7%)

Comparison between microscopical and radiological techniques were also done and found that of the 86 patients examined, 12 (13.7%) were smear positive (microscopy) while 52 (60.5%) were positive for radiological technique Table 2. This difference is statistically significant. The ideal specimens of most diagnostic value were also investigated. Three specimens were collected within 24 hours. Specimen I (spot specimen) was collected when the patient first reported at the clinic (between 10 am and 12 noon). Specimen II (collection samples) was collected in the morning (between 5 am and 6 am) before eating or brushing of mouth and specimen III (spot sample) was collected at the clinic next day (between 10 am and 12 noon). The early morning specimen (sample II) yielded the highest number of positive results of 12(13.9%) (Table 3) indicating that the early specimen is of most diagnostic value.

**Table 2: Comparison between Microscopical and Radiological Techniques for Diagnosis of Pulmonary TB In HIV/AIDS Patients**

	Microscopy %	Radiology %
Positive test	12 (13.9%)	52 (60.5%)
Negative test	74 (86.1%)	34 (39.5%)
Total	86	86

**Table 3: Comparison of Various Specimens Collected At Different Periods of The Day**

TB Status	Specimen I (Spot sample) (%)	Specimen II (Collection sample) (%)	Specimen III (Spot sample) (%)
Positive	9(10.5%)	12(13.9%)	8 (9.3%)
Negative	77 (89.5%)	74 (86.1%)	78 (90.7%)
Total	86 (100%)	86 (100%)	86 (100%)

The occupation and age distribution frequencies of the HIV/AIDS patients with TB are shown in the table 4. A large proportion of the HIV/AIDS patients with TB cases were artisans which constituted 33.5% while students, drivers and traders were 16.7% each teachers and office workers were 8.3% each.

**Table 4: Occupation and Age Distribution**

0-10	11-20	21-30	31-40	41-50	51+	N(%)
Artisan		2	1	1		4(33.3%)
Student	1	1				2(16.7%)
Teacher				1		1(8.3%)
Driver		1	1			2(16.7%)
Officer			1			1(8.3%)
Worker						
Trader		1			1	2 (16.7%)
Total	1	5	3	2	1	12 (100%)

#### 4. Discussion

This study investigates the prevalence rate of Tuberculosis among HIV/AIDS patients seen in OAUTHC, Ile-Ife. Out of the 86 HIV/AIDS patients sputa samples examined microscopically with ZN staining method, 12 were positive for Acid Fast Bacilli showing a prevalence rate of 13.9%. This high prevalence rate suggests strong association between TB and HIV infection in this environment. This result is in consonance with some reports from other parts of this country and beyond. In a study done in Ilorin, the prevalence of TB among HIV/AIDS patients was 12.6% [21], Plateau state 30%[22] Tanzania 19.3%[23], French Guinea 20%[24] Lagos 5.3%[12]. In the sub-Saharan, TB has been diagnosed in 19 – 44% of patients with AIDS [16] while that of the united state was put at 46.3%[25]. Several factors have been suggested to contribute to the variation in the prevalence of TB among HIV patients. Among them are the demographic position of the patient [13] and their socioeconomic status [26]. It has been observed that TB thrives most in communities in which poverty and destitution abound [27]. The fact that endogenous reactivation TB occur most commonly among persons with AIDS [9] also accounts for the high prevalence rate of TB among HIV/AIDS patients as indicated in this study.

The dual infection of TB and HIV/AIDS may be due to several factors rising from the host and organisms. The immune status of the host have been said to play a vital role in the reactivation of TB. Selwyn and colleagues[9] reported a 24 fold increased risk of developing TB in HIV positive patients who had a previously documented positive TB skin test compared with HIV positive patients with a negative skin test suggesting that much of the TB associated with HIV infections represent reactivation of the disease. That HIV/AIDS interferes greatly with the state immunity of host has further been buttressed in the reports of Di – Perri et al [28] and delay et al [20] which revealed that individual with HIV infection exposed to Mycobacterium tuberculosis were at risk of infection and rapidly progress to a disease state in as short a time as one month after infection.

Among the 12 HIV/AIDS patients having TB in this study, 7 (58.3%) were males and 5 (41.7%) were females and these agree with previous reports indicating higher prevalence in males than females [2,29]. This may be due to the general indicating higher prevalence in males than females [2,29]. This may be due to the general attitude of males towards indiscriminate sex especially when they travel away from their families and visit sex tourist centres.

The age distribution reveals highest prevalence to be in the age group 21 – 30yrs (5.8%) followed by 31- 40yrs (3.4%), which represent the most sexually active age group and correlates with work done by Onipede et al [27] at Ile-Ife. This can have a serious negative effect on socioeconomic status of a country being the reproductive and economically productive age group.

In the comparison between direct microcopy and radiology results, while microcopy revealed 3.7% positive results, the radiology showed 60%. Though this result confirms the works of Cheesbrough [30] and Eliot et al [14] who noted that it is difficult to detect TB in the sputum of those co-infected with HIV, but it underscores the need for laboratories to combine microscopy with sputum culture in such samples to ensure proper evaluation. This study confirms the interaction between TB and HIV infection in this environment. Persons with HIV infections have a high risk of developing active TB which constitutes a public health hazard as they become reservoir of TB infection.

In the samples comparison, only the early morning samples (specimen II) gave the highest positive result of 13.9% while specimen III and I were 10.5% and 9.3% respectively. Specimen II is of most diagnostic value as have been ascertain from previous work that most patients are more productive soon after rising in the morning [31]. The problems that affect the suitability of sputum specimen for proper laboratory diagnosis of TB can be partially solved by procurement of the freshest possible specimen of deep seated cough, prompt transportation to the laboratory and avoiding long storage in the refrigerators. Provision of instruction sheets for the clinical staff, including nurses, assistants and even patients will assist in the achievement of proper specimen. The laboratory staff should exert strong influence to correct any deviation from proper procedure in procuring optimal specimens. The idea of large repeated or multiple samples should be discouraged as this would lead to wasting of among other things laboratory reagents, personnel's time as well patients resources.

In this study the class of people infected mostly are the artisans (33.3%) followed by the students, drivers and traders with 16.7% each. This may be accounted for by the wide range of various people / customers the artisans come in contact with in the course of their job which expose them more to infective droplets. Another reason could be the constant traveling away from home by this set of people and can also be due to reactivation of dormant M.tuberculosis in their subjects

In conclusion more urgent efforts should be geared to check the spread of HIV infections especially in a depressed economy like the present Nigeria in order to decrease the case of TB. It is also recommended here that patients with dual infection should be closely monitored early enough to put in place appropriate

therapy which will promote the patients health, reduce drug resistance problem and finally prolong life. Patients with newly diagnosed TB should be tested for HIV infection and patients with newly diagnosed HIV should be tested for TB infection. Treatment of TB in HIV infected patients should be by directly observed Therapy (DOT). In addition, intensifying public awareness campaign of this dual infection and how to recognize early pulmonary TB is very important especially to those who are already HIV positive. Open cough or spitting in homes or public places should be avoided. Maintaining standard household hygiene, ventilation and good nutrition will go a long way to reduce risk of family infection. It is strongly believed that if the control and preventive steps suggested are followed up, threat of HIV and TB co-existence will be under check and Nigeria would have succeeded in taking a giant strike towards gaining back her glory.

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