



Original Contribution

**PREVALENCE OF HIV/AIDS AMONG TUBERCULOSIS PATIENTS SEEN
IN A RURAL CLINIC IN NIGERIA**

G. R. Pennap^{1*}, S. Makpa¹, S. Ogbu²

¹Microbiology Unit, Nasarawa State University, Keffi, Nasarawa State, Nigeria

²TB/Leprosy Referral Center, Evangelical Reformed Church of Christ, Alushi, Nasarawa State, Nigeria

ABSTRACT

PURPOSE - Coinfection with Human Immunodeficiency virus (HIV) and *Mycobacterium tuberculosis* the causative agent of Tuberculosis (TB), has been referred to as the "cursed duet" as a result of the attendant morbidity and mortality due to their synergistic actions. This study was carried out to determine the prevalence of HIV infection among Tuberculosis (TB) confirmed patients of a TB/Leprosy referral centre. **METHODS**-The association of prevalence with gender and age as risk factors was also determined. Blood samples were collected by venepuncture from 257 TB patients and their HIV status determined. Viral antibody detection was carried out using ELISA kits, which detected both HIV-1 and HIV-2 and confirmed by Western blot. **RESULT**- Of the 257 patients screened, 44.20% (106) were HIV positive. The prevalence of coinfection was higher among the female (44.82%) than the male (38.30%) patients and highest among those aged 21-40 years old (45.30%). Coinfection was found to be statistically highly associated with gender and age ($p < 0.05$). **CONCLUSION**- A very high prevalence of HIV infection was reported in this study among patients that were on admission on the grounds that they had only TB. Thus it might be pertinent to screen for HIV among all TB patients.

Keywords: Blood samples; Coinfection; Gender; Age; Prevalence

INTRODUCTION

Tuberculosis (TB) has existed in humans since antiquity and has been reported as the most common expressive and infective respiratory disease that results from the inhalation of air droplets infected with tubercle *Mycobacterium tuberculosis* (1, 2). An estimated 1/3 of the world's population is infected with the bacterium, with the highest prevalence of the disease found in sub-Saharan Africa and Asia (2, 3). More than half of these live in countries ravaged by HIV/ AIDS (4). However, Nigeria has been noted as among the leading countries burdened by the scourge and even ranks 4th among the 22 countries that account for 80% of the world's TB cases (5).

The emergence of drug resistant strains has diminished the hope of completely eliminating the disease (6). Similarly, the emergence of Human Immunodeficiency Virus (HIV) has

paved way for the resurgence of *Mycobacterium tuberculosis* infection. While HIV is the most powerful risk factor for the progression of *M tuberculosis* infection to TB disease, TB accelerates the progression of HIV infection to AIDS and shortens the survival of such patients (7, 8, 9). Being infected with both HIV and *M.tuberculosis* is the world's leading cause of death due to infectious agents (10).

The two are intricately linked to malnutrition, unemployment, poverty, drug abuse and alcoholism and have also been referred to as the 'Cursed Duet' (4). De Riemark *et al.* (11) noted that HIV infection has a major but unquantified impact on the risk of TB. This viral infection is characterised by a progressive depletion of CD4+T lymphocytes. This results in the destruction of the immune system leaving the victim vulnerable to a host of opportunistic infection, neurological disorders or malignancies (12, 13). HIV is known to increase the risk of reactivation in people with

*Correspondence to: Pennap, Grace Ishaku
rinmecit.grace@yahoo.com, +2348035884065

latent tuberculosis and also increases the risk of subsequent episodes of TB from exogenous reinfection. Some authors (3, 4, 14) also corroborated by noting that HIV patients are highly vulnerable to TB because of their weakened immune systems and the latter is now their number one killer. Therefore Post *et al.* (15) posited that all patients with TB should be offered HIV testing. Surveillance of HIV among TB patients has been recognised as important as the HIV epidemic continues to fuel TB epidemics. In many countries, HIV prevalence among TB patients is a sensitive indicator of the spread of HIV into the general population (16). Reports show that in Sub-Saharan Africa, HIV seroprevalence rates among TB patients range from 24-67%, while lower rates of 0.4-20.1% have been reported in India (4). In a San Francisco study, 3.7% of TB cases had HIV (11). Likewise 30% coinfection in Trinidad and Tobago (17) and 28.2% in Guyana (18) have been reported.

In the view of the aforementioned, this study became imperative in this area with a reported HIV prevalence of 38.65% (19) in order to provide baseline data in Nasarawa State to alert the TB control programs of the potential HIV problems with a view to the development of joint strategies. More so that anti tuberculosis treatment has been shown to be complicated by frequent drug interactions with highly active antiretroviral therapy (HAART) and adverse drug reactions are more common among HIV-infected patients (4).

MATERIALS AND METHODS

STUDY AREA AND POPULATION

The study was designed to cover individuals receiving treatment for TB at the Tuberculosis/Leprosy unit of Evangelical Reformed Church of Christ (ERCC) Alushi, Nigeria. The Medical Centre is in the Northern part of Nigeria and has a total of 60 beds for both males and female patients. It is one of few such special referral centres in Nigeria and so attracts patients from neighbouring villages. The study was hospital based. Between March 2007 and August 2008, 257 patients with an initial diagnoses of TB were evaluated prospectively following hospitalization at Alushi a primary health care public hospital that is a referral hospital for

tuberculosis. Demographic information about each patient screened was obtained as the sample was collected, such information included sex, and age. Informed consent was obtained from the patients prior to enrolment. For those below 20 years, permission was sought from their parents/guardians. Information about them was treated as confidential. The study did not interfere with the normal management of the patients.

HIV DETECTION

Blood samples were collected from all of the consenting patients and screened for the presence of HIV-1 and HIV-2 using a chromatographic qualitative ELISA test kit according to the manufacturer's instructions. All ELISA positive samples were further confirmed by Western Blot.

The incidence of HIV/TB co-infection was determined as a proportion of HIV seropositive individuals to the total number of patients under consideration and expressed as a percentage. The chi-square test was employed as a statistical tool to determine the relationship between sex, age and HIV/TB co-infection.

RESULTS

Of the 257 patients, 116(45%) were females while 141 (55%) were males. There were more patients in the 21-40 years age group (62%) than in any other age group. Patients above 60 years old were the least (30%).

The overall prevalence of HIV in this study population was 41.2%. In relation to gender, it was 44.8% and 38.3% among females and males respectively (**Table 1**). There was a statistically significant relationship between gender and viral infection ($p < 0.05$). The prevalence of coinfection also varied with age of the patients. It was highest among TB patients aged 21-40 years (45.3%) followed by those aged 41-60 years (36.8%), 1-20 years (34%) and least among those aged above 60 years (25.00%) (**Table 2**). There was a statistically significant association between age and HIV infection among TB patients in this Study ($p < 0.05$).

Table 1. Prevalence of HIV infection among Tuberculosis Patients in relation to gender

Gender	Number Screened	Number Positive	Prevalence (%)
Female	116	52	44.83
Male	141	54	38.30
Total	257	106	41.24

Table 2. Prevalence of HIV infection among Tuberculosis Patients in Relation to Age

Age (Years)	Number Screened	Number Positive	Prevalence (%)
1-20	50	17	34.00
21-40	161	73	45.30
41-60	38	14	36.83
>60	8	2	25.00
Total	257	106	41.24

DISCUSSION

The present study showed a prevalence of 41.2% of HIV infection among patients hospitalized with a diagnosis of Tuberculosis. This is the highest rate that has been published for such studies in Nigeria. This high prevalence might not be unconnected with the fact that the study population has a bias, as it is a study from a TB referral hospital. It is also possible that patients that are coinfecting might be the likely ones to be in serious clinical conditions that will require hospitalization. It could also be as a result of the relatively high HIV prevalence in the area (19) which is known to be important in latent TB reactivation (4) leading to a preponderance of HIV/TB coinfection (11). Reports of similar studies in Nigeria although not from TB hospitals ranged from 12.0% in Ile-Ife (20), 10.0% in Kano (21), 10.5% and 14.9% among children and adults respectively in Sagamu (22), 10.8% in Irrua (23), 6.1% among those aged 20-40 years in Jos (24), 23.6% at Nguru (8), 37.5% in Benin City (25), 4.2% in Oyo and 35.1% in Benue States (26). Others reported 28.12% in Ibadan (27), 19.0% in a semi arid region of Nigeria (28) and 16.6% in Delta state in a population suspected of TB and HIV (29).

Results from this study were however similar to that of a study in Tanzania where 44.1% was reported (30) although it was higher when compared with reports from other parts of the

globe. For example, 0.4-20.1% was reported from India (4, 31, 32), 3.7% in San Francisco (11), 30.0% in Trinidad and Tobago (17), 28.2% in Guyana (18), 9.9% in Cambodia (33), 23.6% in Florida (34) and 10.8% in South West Guatemala (35).

There was a significantly higher prevalence of HIV/TB coinfection ($p < 0.05$) among females than males in the present study. This is probably related to the higher incidence of HIV infection in females which predisposed them to TB as the former is known to activate dormant TB. Women also have a higher susceptibility to HIV infection, are usually exposed to sexual activities earlier than men mainly due to economic circumstances. Furthermore, most African women are so subordinated to their husbands that they have little or no say in issues related to sexual relationships (23). Also this study was carried out in an area where polygamy thrives a lot. It is therefore possible for one male to have been the source of infection to several females. In their study of sex differences in the clinical presentation of urban Nigerian patients with pulmonary tuberculosis, Lawson and colleagues (36) noted that women were more likely to be coinfecting with HIV than males. However, Odaibo et al. (26) did not observe any significant difference in the rate of coinfection in relation to gender.

The preponderance of HIV/TB coinfection among patients aged 21-40 years was observed in this study ($p < 0.05$). This is similar to some other reports (8, 24, 26, 33). This is a sexually active group in which both TB and HIV prevail most (37, 19) and so it was not surprising that the prevalence of coinfection was highest in that age group.

CONCLUSION

Based on the findings of this study there is a high HIV prevalence in this TB patient population. This is of great concern especially as it might affect both patient management and public health prospective. It, therefore, underscores the need for routine HIV serology on all TB patients.

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