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HIV Test Uptake and Sexual Risk Behaviour Assessment among Patients with Pulmonary Tuberculosis in A Resource-Limited Setting

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Abstract

HIV testing among patients with tuberculosis is critical to preventing missed diagnosis of HIV, improving morbidity and mortality and ensuring continuum of care for HIV-TB co-infected patients. The objective was to determine the HIV test uptake and assess sexual risk behaviour among patients with pulmonary tuberculosis attending DOTS clinic in a tertiary hospital in Nigeria. The study also determined the HIV sero-prevalence and evaluated the HIV-TB co-infection pattern among these patients. Routine HIV counseling and testing was offered to consecutive patients with pulmonary tuberculosis attending DOTS clinic between January 2008 and December 2010. Those who accepted to be tested and also consented to the study were interviewed using a pre-tested questionnaire. A total of 301 patients with pulmonary tuberculosis were seen in the DOTS clinic between January 2008 and December 2010. Two hundred and fifty two (83.74

Index terms— HIV test uptake, routine hiv counseling and testing, pulmonary tuberculosis, dots, nigeria.

1 Introduction

uman immunodeficiency virus (HIV) is a potent risk factor for tuberculosis (TB) infection. By producing a progressive decline in cell-mediated greatly increasing the risk of developing disease in coinfected individuals and World Health Organization (WHO) estimated that one third of the world's population was infected with TB and new infection occurred at the rate of one per second and majority co-existed with HIV (2). Tuberculosis has been found to be the leading cause of morbidity and mortality in HIV infected African populations (3)(4)(5)(6). Globally, TB is also the most common opportunistic infection affecting HIV-seropositive individuals (6). Routine HIV counseling and testing (RHCT) is therefore recommended for persons treated for TB in settings of generalized HIV epidemics (7). This has the benefit of early diagnosis of infection thereby preventing morbidity and mortality and sustained transmission through initiating prophylaxis and timely antiretroviral treatment (8,9). HIV test uptake among patients with TB varies widely between 12% and 98% depending on facility settings, availability of trained personnel, patient categorization and testing approach (9,10). HIV prevalence among patients with TB in sub Saharan Africa varied from 20-60% between 1995 and 2005 (10). In settings where well trained personnel at DOTS clinic carried out RHCT, HIV test uptake was higher than where the voluntary counseling and testing (VCT) approach was used (10). Wanyenze et al (11) reported HIV test uptake rate of 70-90% where RHT was adopted; and 12-62% was found where VCT was used (12). There is limited data on HIV test uptake rate among patients with pulmonary tuberculosis (PTB) in Nigeria. The objective was to determine the HIV test uptake and assess sexual risk behaviour among patients with pulmonary tuberculosis attending DOTS clinic in a tertiary hospital in Nigeria. The study also determined the HIV sero-prevalence and evaluated the HIV-TB coinfection pattern among these patients.

2 Methods a) Study Design

3 Descriptive cross-sectional Study Setting

The study was done at the DOTS clinic of the Federal Medical Centre (FMC), Ido-Ekiti, south-west Nigeria from January 2008 to December 2010. The FMC is a tertiary health facility located in a sub-urban town of an estimated population of 107,000 people but serving five contiguous states in south-west Nigeria.

i.

4 Ethical Considerations

The study protocol was approved by the Ethics and Research Committee of the hospital. The consent of the patients was sought and obtained.

III.

5 Recruitment

IV.

6 Rapid hiv Testing

In sub-Saharan Africa, rapid testing for human immunodeficiency virus (HIV) is the most efficient and sometimes the only feasible way to quickly provide information about HIV status among adults and children ?18 months of age (14). HIV rapid tests are relatively cheap, easy to use, fast to perform and accurate and reliable by applying a quality system approach recommended by the WHO (14). Rapid HIV testing was done using two distinct rapid assays. Whole blood from capillary puncture was used and the tests were performed based on the WHO rapid HIV testing guidelines which involved using two distinct rapid assays according to a serial testing algorithm (14). The first testing used Determine TM assay (Abbot Laboratories, Wiesbaden, Germany) and the second testing was by Unigold TM assay (Trinity Biotech, Ireland).

For discordant results, the third testing was done using Stat-Pak TM (Chembio, Medford, US) as the tie breaker. Concordant positive and negative results from the first and second testings were considered as positive and negative results respectively. For quality control, discordant results were first repeated by a senior research counselor and tester to ascertain true inconclusive results and finally tested with the tiebreaker. Final test results were considered positive or negative on the basis of the tie-breaker result and corresponding similar result from one of previous test assays (1,14).

V.

7 PTB Diagnosis

PTB diagnosis was made on the basis of clinical manifestations, radiological features and the result of sputum smear microscopy for acid fast bacilli (AFB). Patients who tested positive for sputum smear microscopy for AFB were diagnosed as sputum smear positive PTB. Those with negative sputum smear microscopy for AFB were diagnosed with both clinical and radiologic findings as sputum smear negative PTB (15,16). The chest radiograph is a very important diagnostic modality for PTB. Upper lobe infiltrates and cavities are the typical findings in reactivation TB, whereas intrathoracic lymphadenopathy and lower lobe disease are seen in primary TB. In early HIV infection, the radiographic pattern tends to be one of reactivation disease with upper lobe infiltrates with or without cavities while in HIV infection with greater degree of immunological suppression, a pattern of primary disease with intrathoracic lymphadenopathy and lower lobe infiltrates is seen.

8 VI.

9 Data Analysis

Statistical analysis was done using SPSS TM 18.0. Descriptive analysis of the data was done. The HIV test uptake and HIV prevalence rates were expressed in percentages, with 95% confidence intervals (95% CI). Some percentages were compared using chi square test and p value < 0.05 was taken as significance.

10 VII.

11 Results

A total of 301 PTB patients participated in the study. One hundred and sixty (53.2%) were male compared with 141 (46.8%) female ($p > 0.05$) (Table 1). The median age of the patients was 35 years. Seventy (22.8%) had no formal education while 74 (24.6%) had primary school as the highest level of education. There were more males than females with post-secondary degree (62.1% versus 37.9%, $p < 0.05$). Only 93 (30.8%) of the patients were married (Table 1). Sexual risk behaviour assessment showed that 89 (29.6%) reported previous HIV testing; 75 (24.9%) had sexual intercourse with two or more partners in the last 3 months; and only Consecutive newly diagnosed PTB patients attending DOTS clinic were offered RHT according to the existing WHO guidelines

(1,2,13). The pre-test counseling was carried out by trained Personnel; and adult patients who gave informed consent or minors whose parents or guardians gave consent on their behalf were tested with rapid HIV testing techniques and received their results immediately. Post-test counseling was done for all the patients tested. Those who were tested positive were subsequently enrolled into HIV treatment and care services. Those excluded from the study included patients who had been tested HIV positive before TB diagnosis was made and those who did not give consent. Pre-tested questionnaire was used for data collection. The questionnaire included sociodemographic factors such as age, sex, marital and educational status. It also contained questions on sexual risk behaviour. 99 (32.9%) reported using condom in the last sexual intercourse.

Of the 301 patients, 252 (83.7%) consented to HIV testing. The highest HIV test uptake rate (91.7%) was found among age the group 15-24 years while the smallest uptake rate (69.7%) was in the 45-54 year age group (Table 2). The HIV sero-prevalence among PTB patients tested was 19.8%. The highest prevalence was found in the 35-44 year age group. Sputum smear negative PTB patients were more likely to have HIV than sputum smear positive patients (17.1% versus 2.7%, p = 0.001). Table 3 shows a progressive increase in HIV test uptake among PTB patients from 2008 to 2010. It also depicts a progressive reduction in HIV-TB coinfection during the same period of time. There is an inverse relationship between HIV test uptake and HIV-TB co-infection. **??**

12 Discussion

The global understanding of the strong synergy between HIV and TB and the need to scale up ART programme and link HIV infected partners to treatment and care underscores the importance of this study (18). Tuberculosis remains the most important opportunistic infection in HIV patients and the leading cause of increased morbidity and mortality (19). Claudia et al (20) demonstrated that RHCT method for TB patients is indispensable in HIV endemic region as recommended by the World Health Organization (WHO) and remains a critical strategy to detect individuals with undiagnosed HIV infection (1,2). Our study showed an increasing HIV test uptake rate from 69.7% in 2008 to 91.7% in 2010 with an average of 83.7%. An HIV test uptake rate of 83.7% among PTB patients is high and this finding is in concordance with previous studies in sub Saharan Africa which reported between 12% and 98% (4, 5, 9, 10). Irrespective of the age group, this HIV uptake rate was high. Our study also revealed that 18.9% of PTB patients were co-infected with HIV. This prevalence rate is nearly four times the threshold (5%) at which the WHO recommends intensified intervention to address HIV-TB co-infection, including HIV counseling and testing for all TB patients (1,3,21). In our study, HIV prevalence was significantly higher in sputum smear negative than in smear positive patients. In HIV-infected patients, clinical features of PTB reflect different levels of immunological suppression. Earlier in the course of HIV disease, tuberculosis is more likely to present as classical reactivation-type disease, whereas patients with advanced immunological suppression are more likely to present with findings consistent with primary TB (22). Our study also showed that HIV prevalence was higher among age groups 35-44 and 45-54 years than the young adults aged 15-34 years. This finding corroborates the report of a previous study by **??**ong and Boffa (23) which showed that HIV co-infection was significantly higher in middle-aged than in young adult TB patients in sub Saharan Africa. The HIV prevalence of 33.3% in patients with PTB aged < 15 years was the highest in our study. This prevalence is about eight times the national prevalence of 4.4% in Nigeria (24). Some of these children were born to mothers who had HIV-TB co-infection. This finding supports the emphasis that household members of TB patients should be encouraged to screen for HIV as they tend to have a greatly elevated HIV sero-prevalence in comparison to the general population (25)(26) **??**27). In the study, less than 30% of the patients reported using condom in the last sex and about 25% had more two or more sexual partners in the last three months. These findings reflect a high level of sexual risk behaviour among PTB patients and this may, in part, be responsible for high HIV prevalence among them.

Finally, our study also showed that there was an inverse relationship between HIV uptake rate and HIV seroprevalence over the years of the study from 2008 to 2010. As the HIV uptake rate increased over the years and with the progressive reduction in missed HIV diagnosis, the sero-prevalence of HIV among PTB patients declined. This finding could be attributed to improvement in the clinical setting such as improved infrastructure and more efficient physical integration of TB/HIV services over this period which facilitated increased patients' attendance, reduced loss of patients to follow up and improved communication among healthcare workers and between healthcare workers and patients (28). There was also continued capacity building training for healthcare workers involved in counseling and testing and in HIV and TB management; more robust monitoring and evaluation, and scale up of community involvement and mobilization.

IX.

13 Conclusion

The study showed a high HIV test uptake among PTB patients and a progressive increase from 2008 to 2010. It also revealed an HIV sero-prevalence of about 20% using RHCT approach. The PTB patients also reported high risk behaviour. There is need to expand community-based education programme emphasizing HIV-TB co-infection pattern and providing increased access to DOTS clinic based HIV testing. There should also be increase in efforts to more effectively integrate TB/HIV services so that all patients with TB would be screened for HIV

and vice versa. Finally, all PTB patients with or without HIV should receive HIV risk reduction counseling. [1]

Figure 1: F

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Figure 2: Table 1 :

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Figure 3: Table 2 :

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Year	2008	2009	2010
No of PTB patients	80	83	138
No (%) of PTB patients tested for HIV	49 (61.3)	65 (78.3)	138 (100)
No (%) of PTB patients not tested for HIV	31 (38.7)	18 (21.7)	-
Prevalence of HIV among PTB patients	32.7%	23.1%	13.8%

VIII.

Figure 4: Table 3 :

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