



Characteristics of HIV Co-Infected Patients among Tuberculosis Patients Accessing Care at a DOTS Clinic in South-Eastern Nigeria

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Abstract

Background: One third of the world's population constituting 2 billion people are infected with Tuberculosis (TB), which is the second most common cause of mortality amongst communicable diseases. Nigeria ranks fourth among 22 high TB burden countries. One of the major challenges to the control of TB is the presence and interaction of TB with HIV. In many parts of Africa, infection with HIV has further increased TB morbidity and mortality. To effectively control TB in Africa the co-infection with HIV must be perfectly understood and adequate measures and strategies developed and implemented. **Methods:** This was a cross sectional descriptive study, carried out between January 2012 and April 2014 at the DOTS clinic of a tertiary hospital in South-Eastern Nigeria. Three hundred and eighty-four tuberculosis patients were interviewed using a structured questionnaire and data on their HIV status and other characteristics were collected. Data were analysed using SPSS Version 20. **Results:** Three hundred and eighty-four tuberculosis patients participated in the study. Eighty-six patients (22.4%) were HIV seropositive. There were 182 males (47.4%) and 202 females (52.6%). The commonest age group was the group 20 - 39 years (51.6%). HIV seropositivity was highest among the age group 20 - 39 years and this was statistically significant ($X^2 = 11.14$, $p = 0.01$). The married patients had the highest proportion of HIV seropositivity and this was statistically significant ($X^2 = 40.76$, $p = 0.00$). The unemployed patients had the highest proportion of HIV seropositivity and it was statistically significant ($X^2 = 35.14$, $p = 0.00$). **Conclusion:** Some basic characteristics of tuberculosis patients predispose them to HIV/TB

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co-infection. The characteristics must be explored further and be factored in the strategies to control tuberculosis in Africa.

Keywords

Tuberculosis, HIV, Co-Infection

Subject Areas: Global Health, Public Health

1. Introduction

One third of the world's population constituting 2 billion people are infected with Tuberculosis (TB), which is the second most common cause of mortality amongst communicable diseases [1]-[3]. The disease is still of global concern and highly prevalent in poor countries, especially in sub-saharan Africa, and Nigeria has the highest burden in Africa [4]-[6]. With a high incidence of 311 per 100,000 population per year and a prevalence of 616 per 100,000 Nigeria ranks fourth among the 22 TB high burden countries [2]. There is need to develop more cost-effective strategies and partnership for TB control especially in donor-dependent resource-poor settings. TB has been noted to significantly contribute to the economic burden in households in Africa [7]. The determinants and risks of acquiring and transmitting TB are yet to be contained [8] [9]. The challenges including the presence and interaction with Human Immunodeficiency Virus (HIV) infection, warrant the need for frequent review of improvement, in the best practices of TB control, especially in resource-poor settings [10].

In many parts of Africa, infection with HIV has further increased TB morbidity and mortality [11]. According to World Health Organization (WHO), there were about 1.1 million HIV positive new TB cases globally in 2012 and around 75% of these people live in Sub-saharan Africa [12]. Also one-third of the 35.3 million people living with HIV worldwide are infected with latent TB [12]. Worse still TB is the leading cause of death among people living with HIV [12].

2. Methods

This was a cross-sectional descriptive study. The study was carried out from 1st January 2012 to 25th April 2014 at the Directly Observed Treatment Short-course (DOTS) clinic of a tertiary hospital in South-eastern Nigeria. The minimum sample size was calculated using the formula for calculating minimum sample size for cross-sectional studies [13]: $n = z^2pq/d^2$. Where $z = 1.96$, $p = 0.45$, $q = 0.55$, $d = 0.05$. The p was got from the prevalence of HIV positive patients among TB patients in a previous study [14]. The minimum sample size calculated was 384. Three hundred and eighty four structured questionnaires were interviewer administered and all were retrieved. The inclusion criteria was patients who were attending the DOTS clinic and had a positive sputum acid and alcohol fast bacilli (AAFB) result. The collected data was analysed with the International Business Machines, statistical package for social sciences (IBM-SPSS) Version 20.0. Frequencies of characteristics were obtained. Chi square test was used to test for significant associations between variables. The p -value was set at 0.05. The frequencies and cross-tabulations for chi square test were presented in tables.

3. Results

Three hundred and eighty four TB patients participated in the study. **Table 1** shows that the commonest age group was the group 20 - 39 years (51.6%). There were 182 males (47.4%) and 201 females (52.6%). One hundred and sixty seven (43.5%) of the respondents were single, while 11 (2.9%) were widowed. One hundred and ninety eight (51.6%) of the respondents had secondary education, 102 (26.6%) had primary education, while 11 (2.9%) had post-graduate education. The commonest occupational group were the business owners (49.7%), followed by the unemployed (39.1%), then the housewives (7.6%), then the civil servants (3.6%). Among the 384 respondents 86 (22.4%) were HIV positive.

Table 2 shows the cross-tabulation of the HIV status of the respondents by their characteristics and test of association with chi-square test. The age group with the highest proportion of HIV sero-positivity was the group

Table 1. Socio-demographic characteristics of the study participants.

Variable	Frequency	Percentage
Age (in years)		
<20	45	11.7
20 - 39	198	51.6
40 - 59	112	29.2
≥60	29	7.6
SEX		
Male	182	47.4
Female	202	52.6
Marital Status		
Single	167	43.5
Married	164	42.7
Separated	18	4.7
Divorced	24	6.3
Widowed	11	2.9
Highest Educational Level		
None	14	3.6
Primary	102	26.6
Secondary	198	51.6
Post Secondary	43	11.2
Tertiary	16	4.2
Postgraduate	11	2.9
Occupation		
Currently Unemployed	150	39.1
Civil Servants	14	3.6
Business Owners	191	49.7
House Wives	29	7.6
HIV Status		
Positive	86	22.4
Negative	298	77.6

20 - 39 years and there was a statistically significant association between age and HIV status ($X^2 = 11.14$, $p = 0.01$). The married patients had the highest proportion of HIV sero-positivity and there was a significant association between marital status and HIV status ($X^2 = 40.76$, $p = 0.00$). The respondents whose highest educational level was secondary education had the highest proportion of HIV sero-positivity and this was statistically significant ($X^2 = 40.56$, $p = 0.00$). There was also a statistically significant association between HIV sero-positivity and occupation, with the unemployed having the highest proportion of positive patients ($X^2 = 35.14$, $p = 0.00$).

4. Discussion

The prevalence of HIV among the smear positive TB patients attending the DOTS clinic was 22.4%. This is lower than the national value of 17% but falls within the range for all the states of Nigeria which is 4.2% to 35.1% [15]. This prevalence was higher than the prevalence reported at Oyo state, Nigeria (12.3%) [16]. Higher prevalences of 25% and 44% were reported.

In this study the age group with the highest HIV sero-positivity rate was the group 20 - 39 years. This is consistent with the findings of many studies [17] [18]. This is understandable because it is consistent with the pattern of HIV infection in the general Nigerian population [19]. There were more female HIV positive patients

Table 2. Cross Tabulation of HIV sero-prevalence rate of the patients by the sociodemographic factors.

Variable	HIV Positive (%)	HIV Negative (%)	Chi Square	p-value
Age (in years)				
<20	11 (12.8)	34 (11.4)	11.14	0.01*
20 - 39	53 (61.6)	145 (48.7)		
40 - 59	22 (25.6)	90 (30.2)		
≥60	0 (0.0)	29 (9.7)		
Sex				
Male	39 (45.3)	143 (48.0)	0.19	0.67
Female	47 (54.7)	155 (52.0)		
Marital Status				
Single	27 (31.4)	140 (47.0)	40.7	0.00*
Married	34 (39.5)	130 (43.6)		
Separated	10 (11.6)	8 (2.7)		
Divorced	15 (17.4)	9 (3.0)		
Widowed	0 (0.0)	11 (3.7)		
Highest Educational Level				
None	10 (11.6)	4 (1.3)	40.56	0.00*
Primary	16 (18.6)	86 (28.9)		
Secondary	40 (46.5)	158 (53)		
Post Secondary	10 (11.6)	33 (11.1)		
Tertiary	10 (11.6)	6 (2.0)		
Post-Graduate	0 (0.0)	11 (3.7)		
Occupation				
Unemployed	42 (48.8)	108 (36.2)	35.14	0.00*
Civil Servant	10 (11.6)	4 (1.3)		
Business Owner	24 (27.9)	167 (56.0)		
Housewives	10 (11.6)	19 (6.4)		

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than males. This is similar to the findings of other studies [16] [20] [21]. This may be explained by the fact that the penile-vaginal transmission by an infected individual in a single sexual exposure is as low as one in 100 from woman to man and as high as one in 300 from man to woman [22].

In this study the married respondents had the highest proportion of HIV sero-positivity. This was statistically significant. This is surprising because it has been demonstrated that single people are more likely to contract HIV than married people [23]. However this may be because there are more female HIV positive patients in this study and married women in Nigeria have less bargaining power in sexual issues, hence are prone to contracting HIV. It is a known fact that high rates of unemployment increase the spread of HIV. This is because many of the unemployed youths are forced to go into prostitution and drug selling/intravenous drug use, hence the spread of HIV. This study corroborates this fact because the proportion of the HIV sero-positive patients who were unemployed was higher than the other occupations and this was statistically significant.

HIV contributes significantly to increase in incidence of TB in most sub-saharan countries [24]. This calls for more action geared towards ensuring that tuberculosis cases in the near future do not become higher than the resources available for its control. This points also to the fact that intensifying and strengthening the HIV/AIDS control programme should be a priority in the control of tuberculosis. Socio economic groups with higher risks should be considered adequately in the fight against HIV and tuberculosis.

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