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Scientific Research

Characterization of Tuberculosis Cases Presenting in a Tertiary Healthcare Facility in South-Eastern Nigeria

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Abstract

Background: Tuberculosis is second only to HIV/AIDS as the greatest killer worldwide, due to a single infectious agent. Directly Observed Treatment Short-Course (DOTS) is presently the WHO recommended programme to fight tuberculosis worldwide. There is need to understand the characteristics of patients who receive treatment for tuberculosis. This will help modify the strategies to fight the scourge of tuberculosis. Methods: This was a retrospective study conducted at the DOTS clinic at Nnamdi Azikiwe University Teaching Hospital Nnewi, Anambra State, Nigeria. The records of patients who received treatment from the clinic from 1st January 2012 to 31st December 2012 were reviewed. Three hundred and fifteen patients were included in the study. Important characteristics of the patients were retrieved. Associations between patients' characteristics were determined using relevant tests of significance. Results: Three hundred and fifteen patients were included in the study. There were more male patients (59%). The reproductive age group (37.5%) was more than the other age groups. Mean age was 33.1 (±18.5) years. There were more rural patients (50.2%) than urban patients (49.8%). There were more pulmonary TB patients (87.3%) than extrapulmonary TB patients (12.7%). There were more sputum AFB negative patients (45.4%) than positive patients (41.3%). There were more HIV negative patients (59.4%) than positive patients (40.6%). Conclusion: This study demonstrated some important characteristics of tuberculosis patients. Such knowledge if taken into consideration in the tuberculosis control programme will definitely improve the outcome of the programme.

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Keywords

Characteristics, Tuberculosis Patients, DOTS, Nigeria

1. Introduction

Tuberculosis (TB) is a disease arising from infection by Mycobacterium tuberculosis [1]. Tuberculosis can affect almost any organ of the body but the lung is the most susceptible organ, making pulmonary tuberculosis the commonest type of tuberculosis. Tuberculosis occurs worldwide [2]. Tuberculosis is a major public health problem globally. Tuberculosis is second only to HIV/AIDS as the greatest killer worldwide, due to a single infectious agent [3]. In 2012, 8.6 million people fell ill with TB and 1.3 million died from TB [3]. Over 95% of TB deaths occur in low and middle income countries and it is among the top three causes of death for women aged 15 to 44 years [3]. In 2012 an estimated 530,000 children became ill with TB and 74,000 HIV negative children died of TB [3]. People infected with TB have a lifetime risk of falling ill with TB of 10%, however persons with compromised immune systems, such as people living with HIV, malnutrition or diabetes, or people who use tobacco, have a much higher risk of falling ill [3]. Sub-Saharan Africa had the greatest proportion of new cases of TB per population, with over 255 cases per 100,000 population in the year 2012 [3]. According to the United States Agency for International Development (USAID), Nigeria ranks fourth among the 22 high-burden TB countries in the world [4]. Nigeria established its National TB and Leprosy Control Programme (NTBLCP) in 1989. The NTBLCP operates along the three levels of government: National, State and Local Government Areas, with coordinating offices at each level. Nigeria adopted the Directly Observed Treatment Short course (DOTS) strategy in 1994. Health facilities at the peripheral level are the operational units of DOTS services. As of 2009, there were 3455 health facilities providing free TB and DOTS services in Nigeria [4]. TB is a social disease with medical aspects. The social factors include many non-medical factors such as poor quality of life, poor housing, overcrowding, under-nutrition, lack of education, large families and lack of awareness of causes of illness [5]. TB is more prevalent in males than in females. Also in developing countries, there is a sharp rise in infection rates from infancy to adolescence. However in developed countries, the disease is more common in the elderly [5]. Drug regimens for treatment of TB are grouped into category one and category two. Category one is used for brand new cases who have not been treated for TB ever in their lives. Category two regimen is for failures after category one treatment, and for relapse cases who came down with TB again after they have been treated with category one and they recovered.

The aim of this study is to describe the characteristics of patients that received treatment for TB at Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi DOTS clinic for the period 1st January 2012 to 31st December 2012.

2. Methodology

This is a retrospective study conducted at the DOTS clinic of NAUTH Nnewi. The clinic register was the source of data. The inclusion criteria were all patients who received treatment for TB for the period 1st January 2012 to 31st December 2012. Patients who received treatment before or after this duration were excluded. Specific characteristics of these patients were extracted using a structured proforma. Characteristics sought included age, sex, place of residence, initial sputum AFB test result, site of TB infection, Treatment regimen, category of patient and HIV status. The collected data was entered into International Business Machines-Statistical Package for Social Sciences (IBM-SPSS) version 20, and analyzed. Chi square test was used to test for association between variables.

3. Results

Three hundred and fifteen patients were treated for tuberculosis in the DOTS clinic during the period under review. The 315 patients' data were available via the clinic register.

Table 1 shows the characteristics of the patients. There were more males (59%) than females (41%). The commonest age group was the group 20 - 39 years (37.5%). The mean age was 33.1 (±18.5). There were more

Table 1. Socio-demographic characteristics of the patients.

Variable	Frequency (%) N = 315
Sex	
Male	186 (59)
Female	129 (41)
Age (in years)	
<20	74 (23.5)
20 - 39	118 (37.5)
40 - 59	104 (33.0)
≥60	19 (6.0)
Residence	
Urban	157 (49.8)
Rural	158 (50.2)

rural patients (50.2%) than urban patients (49.8%).

Table 2 shows that the patients on category 1 regimen (83.5%) were more than those on category 2 regimen (16.5%). Most patients had pulmonary TB (87.3%) as against extrapulmonary TB (12.7%). More patients had negative sputum AFB results (45.3) than positive results (41.3%), while 13.3% could not produce sputum. There were more HIV negative patients (59.4%) than HIV positive patients (40.6%).

Table 3 shows that there was a statistically significant association between the age and HIV status of the patients ($X^2 = 9.229$, $p = 0.03$, with the age groups 20 - 39 and 40 - 59 having the highest proportion of HIV positive patients (38.3% and 38.3% respectively). Also the proportion of the rural patients who were HIV positive (57.0%) was higher than the urban patients who were HIV positive (43.0%) ($X^2 = 4.074$, $p = 0.04$). Also more HIV positive patients had pulmonary TB (95.3%) than extrapulmonary (4.7%) and this was statistically significant ($X^2 = 12.482$, $p = 0.00$).

Table 4 shows that a higher proportion of the patients with positive sputum AFB results received category 1 regimen (89.2%) as against category 2 patients (26.9%) and this was statistically significant ($X^2 = 8.229$, $p = 0.02$). As expected there was statistically significant association between the type of TB and the sputum AFB result as none of the patients that had extrapulmonary TB had positive sputum AFB result, while all the patients that were sputum AFB positive had pulmonary TB (100%), ($X^2 = 36.464$, $p = 0.00$). Also there was statistically significant association between age and sputum AFB status ($X^2 = 125.116$, $p = 0.00$).

Table 5 shows that there was a statistically significant association between the AFB status of the clients and the site of their disease. Also the HIV status and place of residence of the clients has a statistically significant association with the site of disease.

4. Discussion

In this study there were more male than female TB patients and this agrees with the findings of many other studies [6]-[9]. The commonest age group was the group 20 - 39 years. This is similar to the findings of other studies [9] [10] and agrees with the generally accepted knowledge that TB affects the reproductive age groups [3]. In this study there were more rural patients than urban patients. This agrees with the findings of a study done in India [11] but contrasts with the finding of another study done in India where the urban patients were more [12]. More patients had pulmonary TB (87.3%) than extrapulmonary TB (12.7%). Similar findings were reported in other studies [13]-[15] and agreed with generally accepted prevalence of extrapulmonary TB among all cases of TB [16]. More clients in this study had sputum AFB negative results (45.3%) than sputum positive results (41.3%). Several studies have reported such findings [6] [8].

There were more HIV negative patients than HIV positive patients in this study. This HIV/TB coinfection rate was much higher than that reported in a South African study (18%) [17]. This may be because this centre is a referral centre for both TB and HIV treatment. But a higher coinfection rate was reported in a hospital in Johannesburg, South Africa (95%) [18], this very high coinfection rate, which the authors reported as the highest ever reported in the peer-reviewed English literature may reflect the selection bias for in-patients in their study, who generally would have more co-existing conditions than outpatients do. It is also worthy of note that a much

Table 2. Distribution of patients by disease site, AFB status, HIV status and regimen.

Variable	Frequency (%) N = 315
Disease site	
Pulmonary	275 (87.3)
Extra pulmonary	40 (12.7)
Sputum AFB status	
Positive	130 (41.3)
Negative	143 (45.4)
Couldn't produce sputum	42 (13.3)
HIV status	
Positive	128 (40.6)
Negative	187 (59.4)
Regimen	
Category 1	263 (83.5)
Category 2	52 (16.5)

Table 3. Association between HIV status of patients and some characteristics.

Variables	HIV positive	HIV negative	Total	X^2	P value
	N = 128	**N = 187**	**N = 315**		
	n (%)	n (%)	n (%)		
Sex					
Male	64 (50)	122(65.2)	186 (59.0)	7.299	0.01*
Female	64 (50)	65 (34.8)	129 (41.0)		
Age (years)					
<20	28 (21.9)	46 (24.6)	74 (23.5)	9.229	0.03*
20 - 39	49 (38.3)	69 (36.9)	118 (37.5)		
40 - 59	49 (38.3)	55 (29.4)	104 (33.0)		
≥60	2 (1.6)	17 (9.1)	19 (6.0)		
Residence					
Urban	55 (43.0)	102 (54.5)	157 (49.8)	4.074	0.04*
Rural	73 (57.0)	85 (45.5)	158 (50.2)		
Regimen					
Category 1	108 (84.4)	155 (82.9)	263 (83.5)	0.122	0.73
Category 2	20 (15.6)	32 (17.1)	52 (16.5)		
Site of disease					
Pulmonary	122 (95.3)	153 (81.8)	275 (87.3)	12.482	0.00*
Extrapulmonary	6 (4.7)	34 (18.2)	40 (12.7)		
Sputum AFB status					
Positive	45 (35.2)	85 (45.5)	130 (41.3)	5.211	0.07
Negative	68 (53.1)	75 (40.1)	143 (45.4)		
Couldn't produce sputum	15 (11.7)	27 (14.4)	42 (13.3)		

*Statistically significant.

lesser HIV/TB coinfection rate (9.4%) was reported in New Delhi, India [19].

HIV is generally known to be more in the reproductive age [20] [21]. This was corroborated in this study as the age groups with the highest frequencies of HIV positive status among the respondents were of the reproductive stage and this was statistically significant. This is understandable because the commonest mode of transmission of HIV remains the sexual route [21] [22], and these age groups are the most sexually active age groups. Among the HIV positive TB patients more reside in the rural area and this was statistically significant. This is

Table 4. Association between sputum AFB status and some characteristics.

Variables	Positive	Negative	Couldn't produce sputum	Total	X^2	P value
	N = 130	N = 143	N = 42	N = 315		
	n (%)	n (%)	n (%)	n (%)		
Sex						
Male	76 (58.5)	87 (60.8)	23 (54.8)	186 (59.0)	0.527	0.77
Female	54 (41.5)	56 (39.2)	19 (45.2)	129 (59.0)		
Residence						
Urban	63 (48.5)	72 (50.3)	22 (52.4)	157 (49.8)	0.222	0.90
Rural	67 (51.5)	71 (49.7)	20 (47.6)	158 (50.2)		
Regimen						
Category 1	116 (89.2)	110 (76.9)	29 (69.0)	275 (87.3)	36.464	0.00*
Category 2	14 (26.9)	33 (23.1)	5 (11.9)	53 (16.5)		
Site of disease						
Pulmonary	130 (100)	116 (81.1)	29 (69.0)	275 (87.3)	36.464	0.00*
Extrapulmonary	0 (0.0)	27 (18.9)	13 (31.0)	40 (12.7)		
HIV status						
Positive	45 (34.6)	68 (47.6)	15 (35.7)	128 (40.6)	5.211	0.07
Negative	85 (65.4)	75 (52.4)	27 (64.3)	187 (59.4)		
Age (years)						
<20	11 (8.5)	25 (17.5)	38 (90.5)	74 (23.5)	125.116	0.00*
20 - 39	61 (46.9)	57 (39.9)	0 (0.0)	118 (37.5)		
40 - 59	50 (38.5)	51 (35.7)	3 (7.1)	104 (33.0)		
≥60	8 (6.2)	10 (7.0)	1 (2.4)	19 (6.0)		

*Statistically significant.

Table 5. Association between site of diseases and some characteristics.

Variables	Pulmonary	Extrapulmonary	Total	X^2	P value
	N = 275	N = 40	N = 315		
	n (%)	n (%)	n (%)		
Sex					
Male	161 (58.5)	25 (62.5)	186 (59.0)	0.226	0.64
Female	114 (41.5)	15 (37.5)	129 (41.0)		
Sputum AFB status					
Positive	130 (47.3)	0 (0.0)	130 (41.3)	36.46	0.00*
Negative	116 (42.2)	27 (67.5)	143 (45.4)		
Couldn't produce sputum	29 (10.5)	13 (32.5)	42 (13.3)		
HIV status					
Positive	122 (44.4)	6 (15.0)	128 (40.6)	12.482	0.00*
Negative	153 (55.6)	34 (85.0)	187 (59.4)		
Age (years)					
<20	58 (78.4)	16 (21.6)	74 (23.5)	7.584	0.06
20 - 39.9	107 (90.7)	11 (0.0)	118 (37.5)		
40 - 59.9	94 (90.4)	10 (9.6)	104 (33.0)		
≥60	16 (84.2)	3 (15.8)	19 (6.0)		
Residence					
Urban	129 (46.9)	28 (70.0)	157 (49.8)	7.448	0.01*
Rural	146 (53.1)	12 (30.0)	158 (50.2)		
Regimen					
Category 1	233 (84.7)	30 (75.0)	263 (83.5)	2.397	0.12
Category 2	42 (15.3)	10 (25.0)	52 (16.5)		

*Statistically significant.

surprising because the prevalence of HIV in Nigeria is higher in the urban areas than in the rural areas [23] [24]. This could be because the centre is a referral centre which serves a lot of surrounding rural local government areas, though located in an urban local government area.

5. Conclusions and Recommendations

In this study, there were more male TB patients. The reproductive age group was more affected. There were more pulmonary TB patients than extra-pulmonary TB patients. There were more sputum AFB negative patients. There were more HIV negative patients than HIV positive patients. The HIV/TB coinfection rate was higher in the reproductive age group.

We therefore recommend as follows: there should be more rigorous cases found among males. More efforts to combat TB should be channelled towards the reproductive age group. Health workers should not be in a hurry to conclude that sputum smear negative patients do not have TB, also clinical diagnosis should be intensified. Health workers should be wary of the presence of TB in HIV negative individuals despite the fact that HIV increases susceptibility to TB, and there are more HIV negative TB patients than HIV positive TB patients, besides the window period of HIV detection must be borne in mind. Efforts should be made to prevent HIV among youths. Adolescent friendly clinics should be established. Efforts to combat HIV should not be localized in the urban areas alone, as this study has shown that the rural areas must be given due attention in the fight against HIV.

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