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Pattern and magnitude of treatment delay among TB patients in five states in southern Nigeria

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ABSTRACT

Prompt diagnosis and early treatment of Tuberculosis (TB) cases is an important strategy in TB prevention and control. Thus, passive case finding of TB suspects, sputum examination for diagnosis, and prompt treatment using Directly Observed Treatment Short Course (DOTS) are key elements in the national guideline for TB control programme. The aim of this study is to determine the time interval between diagnosis of smear-positive TB cases and the commencement of treatment in DOTS facilities in southern Nigeria. The study was carried out in 20 healthcare facilities supported by TB Control Assistance Program (TB-CAP) involved in TB management in southern Nigeria, which comprised tertiary, secondary, and primary healthcare facilities including public and private facilities. Data were collected through review of clients' and facility records covering July-September 2009. Data collected were sociodemographic characteristics, sputum-smear result, date of diagnosis, and date of commencement of treatment. Data were analyzed using SPSS version 15.0 software. Of the total 2,507 TB suspects examined for Acid-Fast Bacillus (AFB), 323 were diagnosed to be Sputum-Smear–Positive (SS+ve), However, 269 new smear positive cases were commenced on treatment within the period, thus 54 (17.0%) of the new SS+ve cases defaulted initially. One hundred and two (38%) of them commenced TB treatment within 3 days of smear examination for diagnosis, while 59 (22%) commenced 4-6 days after diagnosis. The study revealed significant delay in commencement of TB treatment for most new smear positive TB cases in southern Nigeria and underlines the need to further explore factors responsible for delay in commencement of TB treatment following diagnosis.

Key words: Initial default, pulmonary TB, sputum-smear, TB suspects

Introduction

Nigeria is among the 22 High-Burden Countries (HBC) from Tuberculosis (TB) and, globally, it is currently ranked fourth among HBC. In 2007, according to the World Health Organization (WHO) report, the estimated number of new cases was 460,000, among which 42% were Sputum-Smear–Positive (SS+ve).[1] In 1993, WHO declared TB a global emergency, and since then concerted efforts have been made at national, state, and community levels to eradicate the disease. In 2001, in line with global target, the National TB Program set a goal to achieve case detection rate of 70% and cure rate of 85% by 2005. In order to achieve this goal the country embarked on Directly Observed Treatment Short Course (DOTS) expansion and enhancement program. Consequently, DOTS coverage increased rapidly form 55% in 2002 to 91% in 2007 and, subsequently, case detection and notification of all forms of TB more than doubled from 38,628 in 2002 to 86,241 in 2006. Case detection rate increased from 11% in 2002 to 23% in 2007, although this was still less than WHO's target of 70%. After several years of decline, success rate of the treatment has stabilized at 76%. However, the country case detection and treatment success rates are still among the lowest of high-burden TB countries.[1]

Early diagnosis of disease and prompt initiation of treatment are essential for an effective control program.

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In developing countries, passive case finding based on sputum microscopy examination of suspected cases of TB who present themselves in healthcare facilities remains the approach for TB case detection.[2] Case detection rate and treatment success rate are the key indicators used to assess the National TB control programme. However, studies have highlighted the importance of diagnostic and treatment delays as performance indicators in TB control programme.[3] Treatment delay, like other forms of delays in TB care, is an important factor influencing treatment outcome of patients, cost of treatment both to individual and community as well as rate of transmission within the community. Treatment delay results not only in a more extensive or severe form of the illness, but also increased period of infectivity in the community, both of which result in increased reproductive rate and huge economic loss both to the community and the individual.[4-7] Lin[3] reported that 30 days of delay in the commencement of TB treatment following the onset of symptoms is a turning point at which significant increase in the risk of TB infection occurs among household contacts of TB patients. Some identified major risk factors influencing TB transmission are older age, prolonged contact with TB index patient, index patient with cavitations, and sleeping with a TB patient in the same bedroom.[3,8]

In Lagos state of Nigeria, the mean and median duration of treatment delay is 0.8±0.7 week (5.6±4.9 days) and 1 week (7 days), respectively, and 90% of the TB patients seen at the TB clinic were commenced on treated within one week of presenting to the clinic.[6] However, shorter periods have been reported in Ethiopia, Mediterranean, and Asian countries.[4,8-9] In Malawi, only about 50% of TB patients on admission were started on treatment 5 days after diagnosis, even after introduction of TB infection control guidelines in 1998.[10] Treatment delay has been associated with a combination of patient and health system factors.[8] Among the patient factors said to be associated with it include age, sex, socioeconomic status, and locality. While health-system factors include distance, coverage, healthcare attitude and competence, level of care, and facility type,[2,4,11] it has been reported that health system-focused interventions result in a significant decrease in patient treatment delay.[12]

In Nigeria, few studies have evaluated the pattern of delays among TB patients, and even fewer have focused on determining patterns and magnitude of treatment delays, as well as occurrence of initial default among TB patients. This study is therefore aimed at ascertaining the patterns and magnitude of initial treatment default and treatment delays in five states in southern Nigeria.

Materials and Methods

Study area

The study was a retrospective review of records of selected health care facilities from 5 states in southern Nigeria. The states were AkwaIbom, Bayelsa, Ebonyi, Ekiti, and Imo. AkwaIbom and Bayelsa states are located in the south-south zone of the country, Ebonyi and Imo states are in the south east zone, while Ekiti state is located in the south west zone. The south-south states, particularly Bayelsa, are predominantly riverine communities, characterized by difficult terrains and poor transport system. The south eastern and south western states are in the hinterland but are predominantly rural communities. The predominant economic activity in the states are fishing, farming, and trading; however, some of the inhabitants are engaged in white and blue collar jobs, including the petroleum industry in the south-south zone. The literacy rate in most of the communities is greater than 70%.

Definition of terms

Initial default: Smear-positive Pulmonary Tuberculosis (PTB) patients not confirmed, as starting treatment are reported as initial defaulters.

Treatment delay is defined as the period between diagnosis of smear-positive pulmonary TB and onset of treatment. Using a cut-off period, it has also been defined as a failure to commence TB treatment after two days following the diagnosis of TB.

All the states and facilities studied were purposely selected as beneficiaries of TB Control Assistance Program (TB-CAP) project—a five-year project sponsored by government of The Netherlands. This survey was carried out between July and September 2009, as part of routine monitoring and evaluation activities of the TB-CAP project. A total of 20 healthcare facilities providing TB services and those involved in the TB-CAP project were selected from the states. The survey was carried out by a team comprising three medical officers and a monitoring and evaluation officer. The distribution of the healthcare facilities surveyed comprised four tertiary healthcare facilities, nine secondary healthcare facilities (including four public and five private) and seven Primary Health Centers (PHCs) are as shown in Table 1.

In the selected facilities, the following records were reviewed and relevant data retrieved by using a checklist. From the TB register, the following data were retrieved: total number of patients on treatment, categories of patients, total number of new SS+ve patients,

date of TB diagnosis, and date of commencement of treatment. From laboratory records: total number of sputum suspects examined, total number of sputum suspects that tested positive for Acid-Fast Bacillus (AFB). From patients' records: date of diagnosis, date of commencement of treatment, smear diagnosis (result) and category of treatment.

The data collected were subsequently analyzed using MS-Excel and Epi-6, and the findings are as presented later in the text. Using Chi-square test, the association between healthcare levels and treatment default and treatment delay was tested and alpha of 0.05 was chosen as the level of significance; thus, the calculated $P<0.05$ is considered to be statistically significant. Institutional approval for this study was obtained from the State TB control programme and accorded by the respective heads of the facilities surveyed.

Results

A total of 20 healthcare facilities in five states were surveyed. Among the facilities assessed, two PHCs, one each in Bayelsa and AkwaIbom states, neither investigated nor placed any patient on treatment during the period. The healthcare facilities surveyed included four tertiary healthcare facilities, five public secondary healthcare facilities, seven PHCs, and four private (secondary) healthcare facilities.

A review of the facility records, as shown in Table 2, revealed a total of 2,507 TB suspects who were examined by smear microscopy according to the national guidelines. About 323 (12.9%) of the TB suspects were AFB positive. In the same a period, a total of 633 TB patients were placed on treatment, of which 268 (42.3%) were SS+ve. Fifty-five (16.9%) of the TB suspects that were AFB-positive defaulted initially. Ebonyi state accounted for 57.2%, 47.1%, and 54.1% of TB suspects, TB suspects with SS+ve result, and TB patients with SS+ve result, respectively. The proportion of TB suspects with SS+ve result were the highest in AkwaIbom (26.7%) and Imo states (26.5%), and the least in Ekiti state (14.4%), while the proportion of TB patients with SS+ve result were the highest in Bayelsa (46.6%), Ebonyi (45.2%), and Imo (42.0%) states and the least in Ekiti state (29.3%). Thirty-five (63.6%) suspects out of 55 who defaulted treatment after diagnosis were from Bayelsa state, followed by 9 (16.4%) and 7 (12.7%) from AkwaIbom and Ebonyi states, respectively. The rate of initial default among SS+ve cases was the highest in Bayelsa (38.9%), AkwaIbom (29.0%), and the least in Ebonyi (4.6%) states.

In all the states assessed, about 38.0% of all the SS+ve patients on anti-TB therapy had started their treatment within three days of diagnosis, while 10% were started on treatment at least one month after diagnosis as shown in Table 3. States where at least half of patients commenced anti-TB therapy within three days of diagnosis were Bayelsa (65.5%) and AkwaIbom (50.0%). Most patients (52%) in Ebonyi state started their treatment 7 days after completion of sputum

Table 1: Distribution of healthcare facilities surveyed

State	Facility type			
	Tertiary	Secondary	Primary	Total
Akwalbom	0	2	1	3
Bayelsa	1	3	1	5
Ebonyi	1	3	0	4
Ekiti	1	0	3	4
Imo	1	1	2	4
Total	4	9	7	20

Table 2: Proportion of SS positive cases among TB suspects

Facility records	Ebonyi	Ekiti	Bayelsa	Akwalbom	Imo	Total
TB suspect examined by smear microscopy	1,643	125	500	118	121	2,507
TB suspects with AFB-positive results	152 (9.3)	18 (14.4)	90 (18.0)	31 (26.7)	32 (26.5)	323 (12.9)
TB patients with smear-positive result	145 (45.2)	17 (29.3)	55 (46.6)	22 (32.8)	29 (42.0)	268 (42.3)
Initial default	7	1	35	9	3	55
% Initial default	4.6	5.6	38.9	29.0	9.4	17.0

Table 3: Pattern of treatment delay according to states

Interval between diagnosis and treatment commencement	Ebonyi N=145 (%)	Ekiti N=17 (%)	Bayelsa N=55 (%)	Akwalbom N=22 (%)	Imo N=29 (%)	Total N=268 (%)
0-3 day	39 (26.9)	3 (17.6)	36 (65.5)	11 (50.0)	12 (41.4)	101 (37.7)
4-6 day	31 (21.4)	7 (41.2)	9 (16.4)	6 (27.3)	6 (20.7)	59 (22.0)
≥7 day	59 (40.7)	7 (41.2)	5 (9.1)	5 (22.7)	5 (17.2)	81 (30.2)
≥1 month	16 (11.0)	0 (0.0)	5 (9.1)	0 (0.0)	6 (20.7)	27 (10.1)

smear diagnosis, while 41.2% and 38% of the patients in Imo state started their treatment within the same period.

Further analysis revealed that in some states, distribution of SS+ve TB patients were skewed in favor of some healthcare facilities, accounting for 98.5%, 75.4%, 71.2%, 63.8%, and 55.2% of all patients surveyed in AkwaIbom, Ebonyi, Bayelsa, Imo, and Ekiti states, respectively [Table 4]. Patients that were Sputum-Smear–Negative (SS-ve) were likely to access care in tertiary healthcare facilities than in the lower levels of care (X^2=36.2, P=0.000001). Initial treatment default was less likely to occur among patients accessing care at the PHCs (X^2=66.6, P=0.000001). However, no significant association was found between the level of healthcare facility and treatment delay.

Discussion

In accordance with the national guidelines, TB case finding is carried out using passive surveillance that involves screening TB suspects for AFB using sputum microscopy. The proportion of SS+ve cases detected among the suspects that presented for diagnosis was low. The low proportion of SS+ve cases detected among the TB suspects and the high proportion of SS-ve cases could be attributed to a number of factors. Among these is effect of the country-wide TB behavior change communication intervention aimed at improving symptom recognition and treatment seeking behavior at community level using the mass media. This might have led to an increased number of TB suspects seeking care. Also, the relatively high prevalence of HIV/AIDS in the country could accounts for the high proportion of SS-ve cases. Studies have demonstrated reduced sensitivity of sputum microscopy among HIV-positive individuals.[13] In addition, most of the smear-negative TB cases is diagnosed without adherence to the national guideline.

Table 4: Level of healthcare facilities and TB service utilization

Level of healthcare facilities	Sputum smear		X²	P
	SS+ve N (%)	SS-ve n (%)		
Tertiary	23 (17.6)	108 (82.4)		
Secondary	200 (44.6)	248 (55.4)	36.2	0.0000001
Primary	35 (53.0)	31 (47.0)		
Treatment Delay	0-3 day n (%)	≥4 day n (%)		
Tertiary	7 (31.8)	15 (68.2)		
Secondary	51 (31.1)	113 (68.9)	0.53	0.76
Primary	11 (37.9)	18 (62.1)		
Initial Default	Yes n (%)	No n (%)		
Tertiary	26 (53.1)	23 (46.9)		
Secondary	17 (75.6)	208 (24.4)	66.63	0.000001
Primary	4 (9.8)	37 (90.2)		

Seventeen per cent of the SS+ve cases defaulted prior to commencement of treatment. This rate is slightly higher than 4.5% and 14.9%, reported in India[14-15] and 16% reported in South Africa,[16] but lower than 27.7% reported in Pakistan.[17] Initial treatment default was most common in the south-south states, a predominant riverine area often characterized by difficult terrains and poor means of transport. Factors responsible for initial default were not assessed; however, initial default was most common in secondary facilities than in other facilities, but least common in primary healthcare facilities.

About one-third of the SS+ve patients in all the facilities surveyed commenced DOTS three days following TB diagnosis. Treatment delay after three days of diagnosis was most prevalent in Ekiti and Ebonyi states. Patient treatment delay reported for most facilities in this study is unacceptable, and in some cases, exceeded the recommended overall delay of 21 days for assessing TB care as recommended by WHO. It is evident from the abovementioned that treatment delay is a common problem facing TB control programme in the country, as about only 60% of patients studied had started the treatment within one week of diagnosis. Odusanya and Babafemi reported that in Lagos state, 90% of the TB patients seen were commenced on anti-TB therapy within one week of first contact with the TB clinic; the mean treatment delay was 5.6±4.9 days;[6] shorter mean treatment delay has been reported in Egypt (1.2 days), Yemen (1.7 days), Pakistan (4.2 days), and Somalia (4.5 days).[7]

The study shows that despite increasing DOTS coverage, most patients still do not access treatment promptly. Bassili *et al.*[10] also reported that coverage, though important, is not the only factor responsible for delay in TB treatment; other factors include distance, availability of TB services, as well as cost of services, poverty, and low private sector involvement. Also, other factors that could be responsible for the high initial default reported in this study include poor linkages between TB care providing facilities. Consequently, some patients diagnosed in a facility could opt for care elsewhere. The major constraint of the survey was lack of opportunity to follow-up the patients in order to ascertain reasons for initial default or treatment delay. Further studies are required to explore household and community factors influencing delay in initiation of treatment.

References

1. WHO. Global Tuberculosis Control: A Short Update to the 2009 Report. Geneva:WHO/HTM/TB/2009.426
2. Huong NT, Vree M, Duong BD, Khanh VT, Loan VT, Co NV, *et al*. Delays in the diagnosis and treatment of tuberculosis patients in Vietnam: A cross-sectional study.BMC Public Health 2007;7:110.
3. Lin X, Chongsuvivatwong V, Lin L, Geater A, Lijuan R. Dose-response relationship between treatment delay of smear-positive tuberculosis patients and intra-household transmission: A cross-sectional study. Trans R Soc Trop Med Hyg 2008;102:797-804.
4. Lin H, Deng C,Chou P. Diagnosis and treatment delay among pulmonary tuberculosis patients identified using the Taiwan reporting enquiry system, 2002-2006. BMC Public Health2009;9:5.
5. Storla DG, Yimer S, Bjune GA. A systematic review of delay in the diagnosis and treatment of tuberculosis. BMC Public Health 2008;8:15.
6. Odusanya OO, Babafemi JO. Patterns of delays amongst pulmonary tuberculosis patients in Lagos, Nigeria. BMC Public Health 2004;4:18.
7. Maamari F. Case-finding tuberculosis patients: Diagnostic and treatment delays and their determinants. WHO EMRO East Mediterranean Health J 2008;14:3.
8. Pena IG. Pharmacoeconomic evaluation of tuberculosis treatment among new smear-positive pulmonary tuberculosis patients with patient delay in Caloocan City, Philippines. A paper presented in the 8th Asian Conference on Clinical Pharmacy, Surabaya, Indonesia, July 01 - 04, 2008.
9. Wondimu T, Michael KW, Kassahun W, Getachew S. Delay in initiating tuberculosis treatment and factors associated among pulmonary tuberculosis patients in East Wollega, Western Ethiopia. Ethiopian JHealth Dev2007;21:148-56.
10. Bassili A, Seita A,Baghdadi S, AlAbsi A, Abdilai I, Agboatwalla M, *et al*. Diagnostic and treatment delay in tuberculosis in7 countries of the Eastern Mediterranean Region. Infect DisClinPract 2008;16:23-35.
11. Harris AD, Hargreaves NJ, Gausi F, Kwanjana JH, Salaniponi FM. Preventingtuberculosis among health care workers in Malawi. Bull World Health Organ 2002;80:526-31.
12. Cheng G, Tolhurst R, Li RZ, Meng QY, Tang S. Factors affecting delays in tuberculosis diagnosis in rural china: A case study in four counties in Shandong Province. Trans RSoc Trop Med Hyg 2005;99:355-62.
13. Matee M, Mtei L, Lounasvaara T,Wieland-Alter W, Waddell R, Lyimo J, *et al*. Sputum microscopy for the diagnosis of HIV-associated pulmonary tuberculosis in Tanzania.BMC Public Health 2008;8:68
14. SaiBabu B, Satyanarayana AV, Venkateshwaralu G, Ramakrishna U, Vikram P, Sahu S, *et al*. Initial default among diagnosed sputum smear-positive pulmonary tuberculosis patients in Andhra Pradesh, India. Int J Tuber Lung Dis 2008;12:1055-8.
15. Gopi PG, Chandrasekaran V, Subramani R,Narayanan PR. Failure to initiate treatment for tuberculosis patients diagnosed in a Community survey and at health facilities under DOTS programme in a district of south India. Indian J Tuberculosis 2005;52:153-6.
16. Rao NA, Anwer T, Saleem M.Magnitude of initial default in pulmonary tuberculosis.J Pak Med Assoc 2009;59:223-5.
17. Botha E, Den Boon S, Verver S, Dunbar R, Lawrence KA, Bosman M, *et al*. Initial default from tuberculosis treatment: How often does it happen and what are the reasons. Int J Tuber Lung Dis 2008;12:820-3.

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