pISSN 2320-6071 | eISSN 2320-6012

# **Original Research Article**

DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20172994

# Treatment default among pulmonary tuberculosis patients at an urban slum in South-Eastern Nigeria

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Received: 26 April 2017 Accepted: 24 May 2017

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# **ABSTRACT**

**Background:** Anambra State is one of the States in Nigeria with a high rate of treatment default. The objectives were to examine default from treatment among newly diagnosed pulmonary tuberculosis patients and identify reasons for default.

**Methods:** This prospective observational study was conducted at Okpoko in Ogbaru local government area of Anambra state. A total of 166 patients participated. Diagnosis of pulmonary tuberculosis was based on microscopy. Patients were treated using the standard 6-month regimen recommended by WHO.

**Results:** A treatment default rate of 13.3% was observed. Default was higher in males (15.7%) and in patients aged < 35 years old (P<0.05). Exactly 9 (13.8%) defaulters lived >5km radius from treatment centers versus 3 (12.9%) who lived <5km radius from treatment centers (P<0.05). Majority of patients 17 (77.3%) defaulted during the continuation phase of treatment. The main reasons for default were attributed to harsh attitude of care providers (59.1%), resolution of symptoms (54.5%) migration (36.4%) and poverty (36.4%).

**Conclusions:** Treatment default was high (13.3%) and majority of patients defaulted during the continuation phases. Periodic supervision of community care providers and enhanced counselling of young patients will reduce patient default from treatment.

Keywords: Anambra State, Pulmonary tuberculosis, Reasons, Treatment default

#### INTRODUCTION

Tuberculosis (TB) is a communicable disease requiring prolonged treatment. Poor adherence (default) to antituberculosis medication is a major barrier to its global control. A major contributor to both treatment failure and the rise of multi-drug resistant tuberculosis is inadequate and incomplete treatment. Patient default or drop-out from tuberculosis treatment is one of the most important reasons for not completing treatment. Default from pulmonary tuberculosis (PTB) treatment or loss to follow up is defined according to world health organization and Nigeria tuberculosis control program

guidelines as a TB patient who did not start treatment or whose treatment was interrupted for 2 consecutive months or more.<sup>5,6</sup>

In Nigeria, tuberculosis control follows the guidelines described by directly observed treatment short course strategy (DOTS) and reaches 100% of the population.<sup>7,8</sup> However, the burden of pulmonary tuberculosis remain high: tuberculosis prevalence rates in adults aged 15 years and above were estimated to be 318 per 100,000 population for smear positive pulmonary tuberculosis and 524 for bacteriological-confirmed cases.<sup>9</sup> The treatment success rate in Nigeria has gradually increased over the

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last ten years to 86% in 2012, reaching the national target for 2015 but loss to follow up (default rate) decreased from 13% to 7%. Default rates in four states remained unacceptably high. Kwara, Lagos, Ogun and Anambra States have default rates of 29%, 16%, 15% and 21% respectively.<sup>9</sup>

Poor adherence to a prescribed treatment increases the risk of morbidity, mortality and spread of the disease in the community. <sup>10</sup> TB/DOTS services are provided free of charge in Nigeria. Yet many patients may not be successfully treated. <sup>11</sup> Main reasons for default from treatment noted in literature are early relief from symptoms, poverty, migration, location of treatment centers, drug-related problems and work-related issues. <sup>2,12-14</sup>

Anambra State has a high rate of default from pulmonary tuberculosis treatment (21%) and there has been little work to identify and readjust this anomaly. This study is therefore to examine default from treatment among newly diagnosed pulmonary tuberculosis patients and identify their reasons, which can be resolved to improve tuberculosis control in the state.

#### **METHODS**

This prospective, observational study was conducted at Okpoko, a densely-populated, low-income slum in Ogbaru local government area of Anambra state Nigeria between 1<sup>st</sup> January 2016-31<sup>st</sup> December 2016. Okpoko has an estimated population of 670,000. The population density is estimated at 49.78 persons/hectare<sup>15</sup> and are inhabited by poor and middle-class families. Residential and sanitary conditions are typical of any congested urban settlement.

There are five TB/DOTS centers in Okpoko (2 are public and 3 private health facilities). A central TB registrar for all the facilities are kept at primary healthcare (PHC) 1 located at Unaka lane, okpoko. The local government TB supervisor for Ogbaru (TBLS) coordinates the activities of all the treatment centers. German leprosy and tuberculosis relief association (GLRA) and the national TB programme provides tuberculosis medicines and services free to the public.

# Study participants

The study comprises of 166 newly-diagnosed smear positive pulmonary patients registered for and at the point of receiving treatment at the various TB/DOTS centers in Okpoko. Age of the patients ranged from 15 years and older.

Diagnosis of pulmonary tuberculosis was based on National TB guidelines. Sputum smears from presumptive TB cases were strained using Ziehl- Neelsen technique and acid-fast bacilli (AFB) graded according to the recent WHO policy. <sup>16</sup> All pulmonary tuberculosis

patients were followed up at 2<sup>nd</sup>, 5<sup>th</sup> and 6<sup>th</sup> months following chemotherapy.

# Pulmonary tuberculosis treatment

Each new PTB patient was treated daily using a 6-month regimen in accordance with Nigeria National Tuberculosis and Leprosy Control Programme (NTBLCP) and WHO recommendations. <sup>17</sup> It consists of 2 months intensive phase treatment with RHZE (150/75/400/275mg) tablets and 4 months continuation phase treatment with RH (150/75mg) tablets. RHZE contains the drugs rifampicin (R), isoniazid(H), Pyrazinamide (Z) and ethambutol (E).

A trained nurse at the TB/DOTS centers observed patient daily intake of medications at intensive phase. However, adherence to the overall treatment was monitored during the monthly drug collection visits and at 2<sup>nd</sup>, 5<sup>th</sup> and 6<sup>th</sup> month follow up sputum examinations.

Patients who defaulted were traced via telephone calls, text messages and were also visited at home by the TBLS, who persuaded them to returned to treatment. They were interviewed to find out reasons why they defaulted.

Data generated were analyzed by descriptive statistics and we compared proportions using the chi-square test. A P-value of <0.05 was considered significant.

The study was approved by the Local Government health and ethics committee and patient's voluntary consented to participate.

## **RESULTS**

Table 1: Demographic characteristics and default pattern of pulmonary tuberculosis patients receiving treatment at Okpobo TB/DOTS centers.

n=166				
Gender	Treatment defaulters (%)	Non-defaulters (%)	Total	
Males	16 (15.7)	86 (84.3)	102	
Females	6 (9.4)	58 (90.6)	64	
Total	22 (13.3)	144 (86.7)		
Age (years)				
<u>&lt;</u> 35	14 (14.9)	80 (85.1)	94	
<u>≥</u> 35	8 (11.1)	64 (88.9)	72	
Location of residence from TB/DOTS center				
<5km	13 (12.9)	88 (87.1)	101	
>5km	9 (13.8)	56 (86.2)	65	

A default rate of 13.3% was observed among 166 pulmonary tuberculosis patients receiving treatment at TB/DOTS centers in Okpoko. Default from treatment was higher in males 16 (15.7%) than females 6 (9.4%) (P<0.05). Exactly 14 (14.9%) of the treatment defaulters

were <35 years old. Among the 22 pulmonary tuberculosis patients that defaulted, 9 (13.8%) lived >5km radius from TB/DOTS centers. Distance from TB/DOTS centers was not significantly associated with default (p>0.05).

Seventeen of 22 (77.3%) patients defaulted during the continuation phase (Table 2).

Table 2: Time of default from treatment of pulmonary tuberculosis patients receiving treatment at Okpoko TB/DOTS Centers.

n=22		
Month of treatment before default	No. of defaulters (%)	Cumulative frequency %
0-2	2 (9.1)	2 (9.1)
3-4	17 (77.3)	19 (86.4)
5-6	3 (13.6)	22 (100)

Reason(s) for default as given by the patients are presented in Table 3.

Table 3: Reason(s) for default from treatment given by pulmonary tuberculosis patients at Okpoko TB/DOTS centers.

Reason (s)*	Responses (%)
Attitude of DOTS providers	13 (59.1)
Resolution of symptoms which led to false sense of cure	12 (54.5)
Domestic problems	11 (50.0)
Poverty (cost local transportation)	8 (36.4)
Migration	8 (36.4)
Work-related issues	7 (31.8)
Distance from TB/DOTS center	4 (18.2)
Adverse drug reaction	3 (13.6)

<sup>\*</sup>Multiple reasons.

The main reason(s) were attributed to attitude of DOTS provides 13 (59.1%) and resolution of symptoms 12 (54.5%) which gave false sense of cure. Other important reasons were domestic problems 11 (50%), migration 8 (36.4%), poverty (i.e. inability to afford cost of local transport and work-related issues 7 (31.8%). It is interesting to note that adverse drug reaction ranked low 3 (13.6%) as reason for default.

#### **DISCUSSION**

APulmonary tuberculosis is a curable disease. However, patient's non-adherence to treatment is a major impediment to its effective control. In this study, default rate among pulmonary tuberculosis patients receiving treatment was 13.3%. Our finding was like 11.3% observed earlier in Anambra State and 14.4% in Ogun State, but higher than the National default rate of 7%.<sup>11,18</sup>

Anambra State ranks high in default from treatment as the National Tuberculosis Programme (NTP) rate was 21% in 2012.<sup>9</sup> The result of this and previous studies indicate an improvement over time in the state.

Several studies have reported similarly high default rates in African populations to range from 8% to 44%. <sup>19-22</sup> The differences in default may be explained by location of the study and class of participants. The present study was conducted in an urban slum. The high rate of default we observed could also be a result of differences in follow up and counseling of patients at TB/DOTS clinics across the facilities. <sup>23</sup> This indicates that much health education still needs to be done at the TB/DOTS centers and community levels to sensitize community members on the need for treatment adherence in the management of pulmonary tuberculosis.

Consistent with previous studies default from treatment was higher in males (15.7%) than in females (9.4%). Considering their role as economic providers, men may have difficulty complying with treatment and follow up schedules.  $^{13,21-24}$  It is important, therefore to evolve gender specific motivation strategies to reduce default. Drop-out of treatment was more among patients aged  $\leq\!35$  years old. Some studies have similarly reported high default rate with the younger age groups.  $^{25}$  This finding contrasts with previous studies in Ethiopia and China where older age groups was associated with increased risk of default.  $^{26,27}$ 

Distance from TB/DOTS centre was not significantly associated with treatment default in this study. Apart from conducting the study in Okpoko, an urban slum, the DOT strategy adopted by NTBLCP specifies that patient is selected for treatment based on location of residence from TB/DOT center. This makes it easier for patients to attend health facilities and be observed at the intensive phase therapy.

However, some studies have found distance from TB/DOTS centers to be associated with treatment default.<sup>28</sup> This confirms that the selection criterion is convenient. Accessing treatment at a distant hospital was not an issue in this study population.

Default has been linked to the length and complexity of treatment. <sup>25,26</sup> In the study, majority of patients defaulted during the continuation phase of treatment (i.e. between 3<sup>rd</sup> and 4<sup>th</sup> month). This finding agrees with recent studies in Morocco, Moldova, Indonesia and a systematic review which suggested that substantial proportion of defaulters appear to leave treatment in the late stages of the current 6-month regimen in low-and-middle-income countries. <sup>29</sup> Higher default rates during the continuation phase of treatment have been suggested to be due to on-going direct and indirect costs of care. <sup>30</sup> It has however been suggested that any new tuberculosis chemotherapeutic agents which can further reduce the length of treatment,

will ultimately improve global tuberculosis treatment success rates.<sup>34</sup>

The main reasons for default given by majority of patients was the attitude of DOT providers, resolution of symptoms and domestic problems. It was felt that workload caused some DOT givers to have a bad, discriminatory attitude towards their patients. Some respondents said, "they were harsh". These attitudes stigmatized the patient, fueling default. Periodic supervision of community DOT providers by State TB Control Officer is important to minimize default.

Resolution of tuberculosis symptoms made 54.5% of respondents to default from treatment. They felt cured and did not continue with treatment. This finding is similar to a study for Bihar and West Bengal, which reported that improvement in symptoms (40% and 50%) caused default in some patients.<sup>33</sup> Naturally, patients may be inclined to leave tuberculosis treatment when they begin to feel markedly letter.<sup>34</sup>

Initial counseling by DOT care givers explaining the treatment plan before starting of treatment will enhance adherence to treatment.

Other important reasons for default were poverty. Exactly 36.4% of respondents gave this reason in the context of inability to pay for transport to and for health facility. In our setting, tuberculosis medication and services are free, yet un-accessible by the poor. Reducing economic burden of tuberculosis treatment for the poorest will help to achieve improve default rates.<sup>32</sup>

Migration from an area of residence while on pulmonary tuberculosis treatment to another area was a reason for dropping-out of treatment given by 36.4% of respondents in this study. In a similar study, 29% of defaulters gave same reason.<sup>2</sup> In Nigeria, directly observed treatment strategy services has reached 100% of the population. Patients should be informed and encouraged to continue treatment at the next TB/DOTS center in the area where they migrated to. The DOTS personnel, if informed of the movement, should officially transfer patient's treatment to the DOTS center.

#### **CONCLUSION**

Treatment default rate of 13.3% was observed in the study and majority of patients defaulted during the continuation phase of treatment. Default was higher in males and patients aged 35 years and below. Patients blamed their default mainly on harsh attitude of DOTS providers, resolution of symptoms and inability to afford transportation costs to TB/DOTS centers. Enhanced counseling and education of young patients on adherence to pulmonary tuberculosis treatment will reduce default rate.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Nwachukwu NO, Onyeagba AR, Onwuchekwa EC, Uche OC, Esther UA. Treatment default among pulmonary tuberculosis patients at an urban slum in South-eastern Nigeria. Int J Res Med Sci 2017;5:3098-102.