Default from Tuberculosis Treatment Programme in Sagamu, Nigeria

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ABSTRACT

Background: The study was embarked on to determine the risk factors associated with default from tuberculosis treatment in Sagamu, Nigeria.

Methods: A retrospective study of 774 adult patients aged 15 years and above registered for anti-tuberculosis DOTS therapy was conducted between January 1997 and December 2003 at the Department of Community Medicine and Primary Care, Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria. Patients who defaulted (cases) during the course of treatment were compared with non-defaulters (controls) who commenced and completed their TB treatment at the same time.

Results: There were 178 (23%) defaulted cases during the study period. Defaulting rate was highest (78.1%) during the continuation phase of the treatment. There was a significant downward trend in default rate from 37.9% in 1997 to 8.4% in 2003 (p<0.001). HIV-positive patients had twice the risk of default during the intensive phase of treatment than HIV-negative patients (OR 2.61: CI 0.84-7.97;P=0.06). Important risk factor associated with non-compliance was male sex 9OR 1.64: CI.1.15-2.34; p<0.01). HIV status (OR: 1.4 CI: 0.77-2.57;p>0.05), previous treatment (OR: 0.75 CI: 0.43-1.30: p>0.05), sputum smear result (1.02: CI: 0.59-1.74: p>0.05) were not significantly associated with default from treatment.

Conclusion: Defaulting was higher in men than women. A downward trend over time was observed. Alternative strategies such as the use of family members to oversee treatment may be desirable in men. There is also a need to shorten duration of treatment, decentralize and make DOTS more accessible, and ensure adequate uninterrupted drug supply to TB treatment centres.

KEYWORDS: Tuberculosis; Default; Risk factors; Treatment outcome.

INTRODUCTION

Tuberculosis (TB) is the leading cause of death from any single infectious disease in the world[1]. In Nigeria, it is estimated that about 200,000 of all types and 100,000 of new sputum-positive tuberculosis occur each year with an estimated 2% annual risk of infection[2]. In spite of the availability of potent anti-tuberculosis drugs, non-compliance to these drugs has been one of the main obstacles to the control of the disease. Several reasons for default have been reported ranging from a poor correlation between patient and programme needs and priorities[3]. The relatively long duration of treatment, the need for multiple drugs and socioeconomic factors are the main reasons for non-compliance to TB treatment[4]. Default from treatment has led to the emergence of multi-drug resistant tuberculosis (MDR-TB) and a poor treatment outcome[5]. MDR-TB, regarded as an important cause of TB morbidity and mortality, poses a greater challenge to the control of tuberculosis. It is difficult to cure and very expensive to manage, thus overstretching the already strained resources for TB control in most developing countries[6].

The current recommended national guideline for TB treatment is for a minimum duration of 8 months[2] which is longer than the 6 months regime used in many developed countries[7,8]. In spite of its public health importance, data regarding default from TB treatment in West Africa that could provide useful information to clinicians in this environment are limited. We therefore embarked on this study to assess the factors associated with default from TB treatment at the Tuberculosis and Leprosy Control (TBL) centre in Sagamu, Ogun state, Nigeria.

MATERIALS AND METHOD
Study Area and Patirnts

The study was carried out in Sagamu Local Government Area, Ogun State, Nigeria. The town is a semi-urban area with an estimated population of 200,000 people[9]. It is located midway about 50 km northward from Lagos and southward from Ibadan. The German Leprosy Relief Association (GLRA) was responsible for the provisions of free drugs for the programme. Patients with suspected or confirmed diagnosis of TB are referred to the TBL Unit. Diagnosis of TB was based on the finding of at least two out of the three samples positive for acid-fast bacilli by Ziehl-Neelsen stain. Patients who are sputum smear-negative but suspected to have TB are further

evaluated with a chest radiograph, Mantoux skin reaction, erythrocyte sedimentation rate and clinical assessment. Patients are then categorised as new patient, treatment after default, relapse and treatment failure according to the national tuberculosis and leprosy control treatment guidelines[2]. All smear-positive and very sick smear-negative TB patients were commenced on short course chemotherapy (SCC) as out-patients with daily Rifampicin, Isoniazid, Pyrazinamide and Ethambutol for 2 months of intensive treatment followed by Ethambutol/Thiacetazone and Isoniazid on outpatient for 6 months. Patients receiving re-treatment regime (i.e relapse, treatment after default and treatment failure patients) received a 3 months intensive phase with the addition of Streptomycin for two months to the above-named four drugs in the intensive phase of SCC. The continuation phase is for 5 months with Rifampicin, Isoniazid and Ethambutol three times a week.

Methods

The study was a retrospective review of all pulmonary TB patients aged 15 years and above who presented and were treated with standard DOTS anti-tuberculosis treatment at the Tuberculosis and Leprosy Control Centre at Olabisi Onabanjo University Teaching Hospital (OOUTH), Sagamu, between January 1997 and December 2003. In all, 841 patients were registered during the study period. However, patients who died, failed treatment or transferred out to another district during the period of study (n=67) were excluded from this analysis. Thus the analysis was based on patients who defaulted treatment (n=178) referred to as cases and patients that completed treatment during the same period (n=596) referred to as controls.

HIV infection was diagnosed by the use of two methods namely the Immunocombs II HIV 1&2 Bispot test kit (Orgenics, France) and the Capillus HIV-1/HIV-2 kit (Cambridge diagnostics, Ireland). A positive test was considered only when the blood sample is positive for the two test kits. The Western blot was not available at the centre during the period under review. All reviewed patients were offered pre and post-test counselling before and after HIV screening by trained counsellors.

Patients who default from treatment were defined as those who had failed to collect medication for more than 2 consecutive months after the date of the last attendance during the course of treatment. Demographic and clinical characteristics, including history, treatment, and outcome, were compared between defaulters and non-defaulters among those with pulmonary disease.

Data Analysis

Data analysis was done using Epi Info 2002 statistical software. A two-sided p-value of 0.05 or less for comparison of potential risk factors for defaulting treatment was considered statistically significant. The difference between cases of default and controls were tested by chi-squared analysis or analysis of variance. Multivariate analysis was used to determine the association between selected risk factors and treatment default.

RESULTS

In all, a total of 774 adult pulmonary TB patients were eligible for this analysis. There were 379 men and 395 women and thus the M: F ratio was 1:1.04. The mean age of the study population was 32.2±13.3 years. Men were significantly older than women (33.6± 14.1 vs 30.8±12.5 years; p<0.01). The HIV sero-prevalence rate among the study population was 10.3%.

Of the 774 patients, 178 (23%) defaulted from the treatment programme. There was no significant age difference between those that defaulted treatment and those that completed treatment (32.3±13.2 vs 32.1±13.4 years; p=0.86). Defaulting was highest (78.1%) during the continuation phase of treatment. HIV-positive patients had twice the risk of default during the intensive phase of treatment (i.e. within two months of treatment) than HIV-negative individuals though the association was not statistically significant. 36.8% vs 18.2%; OR 2.61: CI 0.84-7.97:P=0.06}. There was a significant downward trend in default rate over the years from 37.9% in 1997 to 8.4% in 2003 (p<0.001), however, a sudden rise (32.2%) was observed in the year 2002 (Figure 1).

Table I shows important risk factors such as positive HIV status (10.7% vs 10.2%;p>0.05), previous treatment (10.6% vs 13.6%; p>0.05), sputum positive smear (84.8% vs 86.4%; p>0.05) were not significantly associated with default from treatment. Men were more likely to default than women (58.4% vs 46.1%;p<0.01). In multivariate analysis male sex remained the only important risk factor associated with default from TB treatment (OR 1.64; 95% CI.1.15-2.34; p<0.01). Other risk factors such as HIV status (OR: 1.4 CI: 0.77-2.57;p>0.05), previous treatment (OR: 0.75 CI: 0.43-1.30: p>0.05), sputum smear result (OR:1.02: CI: 0.59-1.74: p>0.05) were not significantly associated with default from treatment as shown in Table II.

TABLE I . A comparison of defaulters and non-defaulters from tuberculosis treatment according to demographic characteri stics and medical history in Ogun State, Nigeria (1997 -2003).

Characteristics	Defaulters N=178	Non -Defaulters N=596	χ^2	OR (95% CI)	P-Value
Sex					
Female	74(41.6)	321(53.9)		1.0	
Male	104(58.4)	275(46.1)	8.28	1.64(1.15 - 2.34)	<0.01
HIV					
Negative	159(89.3)	535(89.8)		1.0	
Po sitive	19(10.7)	61(10.2)	0.03	1.05(0.59 -1.86)	0.87
Treatment status					
New	159(89.4)	515(86.4)		1.0	
Re -treatment	19(10.6)	81(13.6)	1.04	0.76(0.43 -1.33)	0.31
Sputum smear					
Negative	27(15.2)	81(13 .6)		1.0	
Positive	151(84.8)	515(86.4)	0.35	1.15(0.7 -1.89)	0.55
Age group (years)					
< 19	16(21.3)	59(78.7)	0.13	0.90(0.48 -1.66)	0.72
20 -39	121(23.2)	400(76.8)	0.05	1.04(0.72 -1.51)	0.83
40 -59	28(23.1)	93(76.9)	0.00	1.01(0.62 -1.64)	0.97
>60	13(22.8)	44(77.2)	0.00	0.99(0.49 -1.95)	0.97
Age ± SD (yrs)	32.3 ± 13.2	32.1 ± 13.4			0.86*

* test

Table II. Odds ratios from multivariate analysis examining the association between selected risk factors and treatment default.

Risk factors	Odds Ratio (95% CI)	P value
HIV status		
Negative	1.0	
Positive	1.40 (0.77-2.57)	0.84
Sputum smear		
Negative	1.0	
Positive	1.02 (0.59-1.74)	0.96
Treatment status		
New	1.0	
Re - treatment	0.75 (0.43–1.30)	0.3
Age		
≤30	1.0	
≥30	1.1(0.77–1.56)	0.9
Sex		
Female	1.0	
Male	1.72(1.21 - 2.43)	<0.001

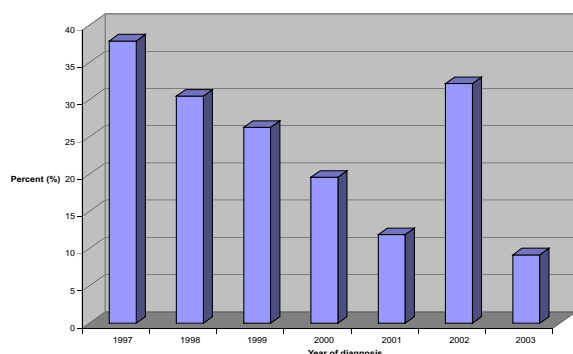OR=Odds ratio. OR=1 is the referent category.

FIGURE 1. Bar chart showing defaulter rate among TB patients receiving DOTS between 1997-2003.

DISCUSSION

This study observed a defaulter rate of 23% among patients receiving the directly observed treatment for TB during the study period. This is higher than 8% and 8.3% reported in Hong Kong[10] and Vietnam[11] respectively. The high default rate in this study may be related to the long duration of the DOTS treatment in Nigeria which utilises a minimum duration of 8 months compared with the 6 months regime utilised in these other countries. However, the finding of this study

suggests a much lower default rate than that observed in a study in Ilorin, northern Nigeria which reported a rate of 44.2%[12]. Several reasons may account for this wide disparity; firstly, in spite of the fact that both studies were carried out in a teaching hospital setting, important differences exist in the structures available for the treatment of TB. In our study, the TB programme has a strong community based component with infrastructure for patients' follow-up. In addition, the drugs and laboratory investigations for Acid fast Bacilli (AFB) are given free of cost by GLRA. Improving access to quality
anti-TB medications is important if we are to realise the global target of 85% cure rate set by the World Health Organization.

Majority of those who default from TB treatment did so during the continuation phase of treatment as reported in other studies[13-15]. This may be due to the long duration of treatment and the feeling of well being by the patient upon commencing treatment. However, it was found that TB/HIV co-infected patients were more likely to default during the intensive phase compared with TB patients without HIV. This may be related to the fact that HIV/TB co-infected patients experience progressive deterioration in their health status as a result of the ongoing HIV infection and as such coming to the TB clinic on a daily basis poses a great burden on them. HIV-positive TB patients are particularly susceptible to other opportunistic infections during TB treatment[16]. This makes them more ill and more likely to default during the intensive phase of TB treatment. Exploring other approaches to ensure adherence among TB/HIV co-infected patients during the intensive phase which is the most critical period in the DOTS strategy for TB control is highly desirable.

In this study, we found that default during TB treatment was associated with the year of diagnosis. There was a gradual decline in default from TB treatment over the years. This is probably due to the better programme management in patient selection after the first year, where only patients resident within the local government area were eligible to benefits from the treatment programme while those living outside the local government were referred to the nearest centre to their place of residence. Continuous health education of patients by health workers may also have contributed to the decline experienced over the years. However we observed an increase in default from treatment in the year 2002. This may be due to disruption in the supply of anti-tuberculosis drugs to the centre from the Local Government Area Council. As a result of this, patients had to buy their anti-TB drugs during such shortages to ensure continuity of treatment. These drugs are expensive and not affordable by the majority of these

patients. Patients who could not afford these drugs were probably discouraged after repeated calls at the centre without success. This could have contributed to the high non-compliance rate observed in that year. The continuous uninterrupted supply of anti-TB drugs is certainly crucial to the success of TB control programmes.

The higher rate of default in men compared to women in this study can be attributed to their breadwinner status in the society. Men tend to leave their homes quite early for work in order to provide for their families and therefore may find it difficult to comply with daily clinic attendance, especially during the intensive phase of the treatment. It is important that the treatment programme be made more flexible to accommodate such individuals. Observation and supervision of treatment by family members is a useful alternative[17].

The implications of the default from TB treatment are worrisome. Defaulters from treatment constitute an infectious pool that maintains the continued transmission of TB within the community. Furthermore, the risk of transmission of multi-drug resistance TB is higher among defaulters compared with non-defaulters[18]. Multi-drug resistant TB poses a big challenge for TB control programmes in that they are expensive to manage and are associated with poor treatment outcome. The TB treatment success rate in Nigeria is between 75-79%[19] which is below the target set by the World Health Organization. The need to develop innovative approaches to ensure compliance to TB treatment cannot be overemphasized. The use of health visitor[20], family members or volunteers to supervise the administration of anti-TB medications[17] and incentives to TB patients during treatment[21] has been associated with adherence to TB treatment and a good treatment outcome.

This study however is not without its limitations. The retrospective nature of the study made it impossible to evaluate the contribution of other factors which might have impact on default from TB treatment. Also, the information collected on the characteristics of patients in the programme was limited. It is imperative for the National Tuberculosis and Leprosy Control Programme (NTBLCP) to update the present form to include more information on the patients admitted into the programme.

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