Original Research Article

Assessing Treatment Outcomes in Previously Treated Tuberculosis Patients' in Nasarawa State, Nigeria: Implication for Resistance

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Abstract

The burden of both TB and HIV infections in Nasarawa State, Nigeria is relatively high, while TB diagnostics are grossly inadequate thus, assessing retreatment outcomes among previously treated TB patients is imperative. This study assessed the proportion of retreatment TB cohorts within two major TB centres in the state. It sought to evaluate treatment outcomes among retreatment TB patients. Retrospective cross-sectional design was adopted. Data was abstracted from the national TB register available at the study sites: Dalhatu Araf Specialist Hospital, Lafia and Evangelical Reformed Church of Christ Medical Centre, Alushi, Nassarawa Eggon, Nasarawa State, Nigeria. A total of 1678 TB cases were abstracted from two facilities, 9.2% of these patients were previously treated of pulmonary TB. While about 21% of previously treated patients lacked access to HIV testing, about 40% of these patients were HIV-infected. Deaths and defaults were more among retreatment patients co-infected with HIV; however, this was not statistically significant. A successful treatment outcome of 86% was reported. Despite high TB/HIV co-infection prevalence rates and the limited laboratory infrastructure in the state, a successful retreatment outcome was achieved.

Keywords: Nasarawa State, Nigeria, Previously treated tuberculosis, Retreatment, Treatment outcomes

INTRODUCTION

The incidence rates of tuberculosis (TB) patients' who return to clinic for retreatment due to relapse, treatment failure or return after default is an issue of public health concern especially when we consider the impact of resistance to TB drugs, and of course, the synergistic interaction between TB and HIV/AIDS. Nigeria has a high burden of both HIV and TB infections with an average HIV/TB co-infection prevalence of 22% above a global average of 13% (WHO, 2012); such mutual interaction is often responsible for re-infection, it complicates and worsens TB progression and diagnoses leading to relapse and treatment failure.

Drug-resistant TB is especially worsened in TB/HIV co-infection as considerable cases of recurrence especially due to exogenous re-infection predominates in patients infected with HIV; while recurrence due to endogenous reactivation predominates in TB patients uninfected with HIV (Narayanan *et al.*, 2010). While socio-economic and medication factors are attributed to poor adherence among TB patients (Bello, 2010), failure within the health systems and health workers attitudes could adversely affect patients' willingness to adhere to medications and clinic appointments with a resultant negative impact on treatment outcomes (Loveday *et al.*, 2014).

TB cohorts with relapse, treatment failure and those who return after default have the potential to fuel the incidence of multi-drug resistant-TB (MDR-TB) and subsequently extensive resistant-TB; this may inadvertently increase the burden of TB thus thwarting

the efforts towards achieving MDG target in the African region.

This study sought to assess the proportion of TB cohorts on retreatment within the two major TB treatment centres in Nasarawa State, Nigeria. It assesses the proportion of previously treated TB cohorts co-infected with HIV and the impact of TB/HIV overlap on treatment outcomes in previously treated TB patients.

METHODS

Study Sites

This study was conducted in two major TB treatment centres in Nasarawa State, Nigeria: Dalhatu Araf Specialist Hospital (DASH) situated in the State Headquarters, Lafia, Southern Senatorial District of the state and the Evangelical Reformed Church of Christ (ERCC) Hospital, Alushi, Nassarawa Eggon Local Government Council situated in the Northern Senatorial District of the state. DASH is a tertiary hospital owned by the State government while ERCC Hospital is a faith based private primary health care centre (PHC); both hospitals have a long history of TB treatment with supports from donor agencies and offer amongst others, integrated TB/HIV care and support programme based on the exemption policy on TB and antiretroviral (ART) medicines.

Study Design

The research design was cross-sectional retrospective study.

Ethical Approval

This research was part of the data collected for a study considered elsewhere and the protocol was approved by the Ethics and Research Committee of the Dalhatu Araf Specialist Hospital, Lafia, Nasarawa State, Nigeria.

Study Participants and Data Collection

Data entry protocol for all the TB patients' enrolled within both facilities from Jan 1st 2012 to March 31st 2013 was abstracted. Pulmonary TB cohorts on retreatment were sorted out for the purpose of this research.

Data Analysis

Data was coded and entred into Microsoft Excel Software and transcribed into an SPSS version 17 for descriptive and inferential statistics.

RESULTS

The study abstracted a total of 1678 TB cases from the TB register of both facilities. This was part of the data abstracted for a study considered for publication elsewhere. Majority of cases (96.4%) were pulmonary TB while extra-pulmonary TB accounted for 3.3%. The least diagnostic parameter was sputum AFB, whereas X-ray and clinical evaluation were commonly exploited (63.6%) for the diagnosis of TB. Of these 1678 reported cases of TB, 1511 (90%) were patients with new TB comprising pulmonary and extra-pulmonary TB; while 9.2% of the patients were those who were previously treated but returned to clinic for retreatment due to relapse, default or failed treatment.

The age range 16-45 represented over three-quarters of TB cohorts on retreatment while those at the extremes of age: 1-5 and greater than 75 years accounted for 3% of retreatment patients. Majority of the previously treated patients (79%) knew their HIV sero-status, while 39.8% were HIV positive, 39.2% were HIV negative and about 21% had not accessed HIV counseling and testing (HCT). Majority of patients on retreatment had relapsed (68.2%), 42(27.3%) of these patients returned after default while 7 of the 153 patients on retreatment had treatment failure (4.5%) (Table 1).

Assessment of Treatment Outcomes among TB Patients on Retreatment

Five (5) of the 153 (3.2%) TB cohorts on retreatment were transferred out, death was recorded in about 7% of the patients' and treatment failure was reported in 1 (0.7%) patient while 9 (6.1%) of these patients defaulted from treatment, however, successful treatment outcome of 86% was achieved (Table 2).

Sero-Prevalence and Treatment Outcome

At the end of the course of treatment, a total of 60 (40.5%) of cohorts were HIV positive, 37.8% were HIV negative, while 21.6% of the patients' do not know their HIV sero-status. Cure rate was higher (33.9%) among HIV negative patients compared to those who were co-infected (20%); however, the difference is not statistically significant. Death and default rates were higher among sero-positive TB cohorts than sero-negative TB patients; this difference is however, not statistically significant (Table 3).

Table 1. HIV Sero-status of Previously Treated Patients

		Relapse	Failure	RAD	Total
HIV STATUS	HIV Positive	36	5	20	61
	HIV Negative	43	2	15	60
	HIV Not Tested	26	0	6	32
Total		105	7	41	153

Table 2. Age Distribution and Treatment Outcomes of Patients on Retreatment

Age		Cured	Treatment Completed	Treatment Failure	Death	Defaulted	Transfer Out	Total
1 – 5	Count	0	1	0	0	0	0	1
	% within count	.0%	1.2%	.0%	.0%	.0%	.0%	.7%
16 – 30	Count	13	30	0	3	6	4	56
	% within count	31.0%	37.0%	.0%	30.0%	66.7%	80.0%	37.8%
31 – 45	Count	23	27	1	5	2	1	59
	% within count	54.8%	33.3%	100.0%	50.0%	22.2%	20.0%	39.9%
46 – 60	Count	2	17	0	1	0	0	20
	% within count	4.8%	21.0%	.0%	10.0%	.0%	.0%	13.5%
61 – 75	Count	4	4	0	1	1	0	10
	% within count	9.5%	4.9%	.0%	10.0%	11.1%	.0%	6.8%
>75	Count	0	2	0	0	0	0	2
	% within count	.0%	2.5%	.0%	.0%	.0%	.0%	1.4%
Total		0	2	0	0	0	0	2

Table 3. Sero-Status of Patients' on Retreatment

		Cured	Treatment Completed	Treatment Failure	Death	Defaulted	Transfer Out	
HIV POSITIVE	Count	12	32	0	5	8	3	60
	% within Outcome	28.6%	39.5%	.0%	50.0%	88.9%	60.0%	40.5%
HIV NEGATIVE	Count	19	32	1	3	0	1	56
	% within Outcome	45.2%	39.5%	100.0%	30.0%	.0%	20.0%	37.8%
HIV ND	Count	11	17	0	2	1	1	32
	% within Outcome	26.2%	21.0%	.0%	20.0%	11.1%	20.0%	21.6%
Total	Count	42	81	1	10	9	5	148
	% within OUTCOME	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

DISCUSSION

The proportion of patients who return for TB retreatment is an issue of public health concern especially in communities or regions of high HIV prevalence rates. The synergistic interplay between TB and HIV has increasingly fostered the armamentarium for widespread resistance to antibacterial agents. Tuberculosis cohorts on retreatment refer to patients with treatment failure, relapse or those who returned after default. These cohorts have higher risk of harbouring resistant strains of *mycobacterium tuberculosis* (Jones-López *et al.*, 2011) and have potential to contribute to transmission of TB (den Boon *et al.*, 2007), often, MDR-TB; this is capable of reversing the progress that has been achieved (WHO, 2010a) and worsening the disease progression. This

study found a previous TB treatment prevalence of 9.2% among TB patients enrolled for treatment; this finding is far below the national average of 20% inspite of the fact that Nasarawa State, Nigeria has a high average HIV prevalence rate of 7.5% (FMOH, 2010). Between 10-20% of TB patients in low and middle income countries present with previously treated TB (WHO, 2012). In Uganda, Anyama et al., (2007) found a retreatment prevalence of 12-44% of cases; while in Cape Town, South Africa, over 50% of sputum smear-positive cases occurred in previously treated patients (den Boon et al., 2007).

High prevalence rates of previously treated TB patients is indicative of poor treatment outcomes which could be attributed to poor adherence and drug resistance (Jones-López et al., 2011), insufficient bacteriological cure of previous disease (Anyama et al., 2007), exogenous re-infection and endogenous reactivation (Narayanan et al., 2010). Prior exposure to anti-TB drugs is well established risk factor for MDR-TB (WHO, 2010a); in Swaziland, MDR-TB prevalence was 7.7% and 33.8% among new pulmonary case patients and previously treated case patients respectively (Sanchez-Padilla et al., 2012); in India, Sethi et al. (2013) found a MDR-TB prevalence of 9.9% among newly diagnosed and 27.6% among previously treated patients. This study found a relatively low prevalence for previously treated TB patients; furthermore, a successful treatment outcome of 86% was achieved following retreatment. However, over 6% of the retreatment patients were reported death, while another 6% defaulted from treatment.

Improving diagnostic capacity has great potential for averting death among retreatment patients. In Nigeria, only four centres offer culture and drug susceptibility testing (DST) for previously treated TB patients which is a pre-requisite for initiation of retreatment and for all TB cases when technical and financial capacity allow (WHO, 2010b; WHO, 2010a); this is grossly inadequate and an issue of critical concern because of the high burden of TB and the emergence of MDR-TB in the country, even though, the country achieved average successful treatment outcomes of 84%, slightly below the international benchmark of 85% (WHO, 2012). Early diagnosis, resistance testing and strict monitoring are paramount for previously treated patients in other to avert deaths while social network mechanisms are essential elements for improving adherence to medicines.

Although 21% of the retreatment patients in this study did not know their sero-status, this study found a high HIV prevalence rate of about 40%; furthermore, no association exists between HIV sero-status and treatment outcomes. However, deaths and defaults were more among TB patients co-infected with HIV. The unavailability of culture and DST in the entire state where this study sites are located entails that undiagnosed resistant TB among previously treated patients are treated with category 2 regimens instead of agents designated for treating MDR-TB; this anomaly is responsible for resistant TB transmission (Escombe et al., 2008). Drug resistant TB is high among previously treated TB patients (Andrews et al., 2010) and especially previously treated HIV infected TB patients (Seithi et al., 2013) and this is capable of worsening disease progression and subsequently raising TB mortality rates. Exogenous re-infection among TB co-infected patients has been reported (Narayanan et al., 2010) and this can inadvertently increase the proportion of previously treated TB patients in the state.

Pooling diagnostic resources from grants available from international donor agencies for TB and related diseases require concerted commitment, political will and respect for humanity by leaders of the developing countries. Given the availability of this funding, lack of resources is not an acceptable rationale for providing a retreatment regimen of first-line drugs (Category 2 regimen) to patients who are clinically suspected of MDR (WHO, 2010). Thus, this lack of commitment is captured in this study as over 21% of patients accessing TB care lacked access to HCT, while none of these previously treated TB cohorts had culture or DST testing. This is consistent with the findings of Joseph et al. (2014) which asserted that Nasarawa State lacked the capacity to independently guarantee a sustainable provision of HIV/AIDS care and support programme for its citizenry.

CONCLUSION

This study revealed a high prevalence rates of HIV infection among retreatment TB patients; though death and default rates were higher among HIV-infected patients, it is however, not statistically significant. A successful treatment outcome above international bench-mark was achieved inspite of the prevailing limitations in TB diagnostics and high overlap between TB and HIV.

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Conflict of Interests

No conflict of interest declared.

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