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Treatment outcome of Tuberculosis and HIV Co-infection at a Tertiary Health Facility in Southeastern Nigeria

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TREATMENT OUTCOME, TUBERCULOSIS, CO-INFECTION, HIV

ABSTRACT

Introduction: The management of tuberculosis is an important public Health issue. TB is a reemerging disease linked with HIV infections. It is necessary to compare the treatment outcome of patients with only Tuberculosis with those with HIV/AIDs co-infection. This study will also provide baseline information on treatment outcome on the DOTS eight month regimen and guide decisions in review of the regimen

Objective: To determine the treatment outcome of the Directly Observed Treatment Short Course (DOTS) in patients with tuberculosis (TB) and TB/HIV co – infection.

Design: A retrospective descriptive study of records of DOTS patients from January 2009 to December 2010 was compiled. Treatment outcome (cured, completed, failure, died, defaulted, transferred out) and HIV status were reviewed.

Results:A total of 575 cases of tuberculosis were assessed and126(22%) were HIV positive. From the total of 293(51%) new smear positive cases,53%(n=155) had only TB and 42%(n=123) had TB/HIV co-infection. Cure rate for new smear positive TB and TB/HIV co-infection was 83 %(n=129) and 74%(n=90) respectively.HIV positive cases were more likely to have higher mortality (17% vs 7%). The difference in all other outcomes (treatment failure, defaulted, transferred out) were not statistically significant.

Conclusion: HIV co-infection resulted in a poorer outcome. Community oriented programmes, early diagnosis and treatment of HIV and isoniazid preventive therapy are essential to improve treatment outcome.

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INTRODUCTION

Tuberculosis is a global health priority and a disease that manifests in its pulmonary form in up to 70% of cases or as extra pulmonary affecting all parts of the body [1]. Globally, an estimated seven million new cases occur each year, resulting in 2 – 3 million deaths despite being curable and preventable with effective treatment regimens and vaccines [2]. Improvement in case identification and compliance with appropriate treatment remains a major challenge worldwide [2].

Nigeria as the most populous country in sub-Saharan Africa, with the highest burden of tuberculosis in Africa of an incidence of 311 per 100, 000 population peryear out of which 137/100,000 population are smear positive and prevalence of 616/100,000 population. It is placed among the top four of the WHO 22 high burden tuberculosis Countries [3]. The estimated mortality rate for the country was 81 cases per 100,000 populations which ranked second in Africa [4].

The Nigerian National Tuberculosis and Leprosy Control Programme (NTBLCP) were established in 1988 for effective TB control operating the Directly Observed Therapy (DOT). The goal of the National TB program is to reduce, the burden of TB by 2015 in line with the Millennium Development Goals (MDGs) and the STOP TB Partnership targets. Some of the targets are to detect at least 70% of the estimated infectious (smear-positive) cases and to achieve a cure rate of at least 85% of the detected smear-positive cases [3].

Sub-Saharan Africa remains the hardest-hit region with more than 68% of people being infected with HIV [5]. An estimated 3.3million Nigerians are living with the virus [6,7].The HIV epidemic is one of the major challenges affecting TB control globally. TB is responsible for about 30% of deaths

among HIV infected individuals [8].The increasing frequency of tuberculosis and HIV co-infection has had considerable impact on TB control in Sub-Saharan Africa making the achievement of the 85% success rate a challenge.

Treatment outcome results can serve as a proxy of the quality of TB treatment provided by the health care system. However, treatment outcome of tuberculosis patients has not been assessed in Abia State, southeast Nigeria. Therefore, this study assesses treatment outcomes of tuberculosis and HIV-infected tuberculosis cases at the Federal Medical Centre Umuahia, in Southeast Nigeria.

STUDY AREA AND METHODS:

The Federal Medical Centre Umuahia is the only federal tertiary health facility in Abia State.. It is situated in Umuahia the capital of Abia state. At the Federal Medical centre, Umuahia tuberculosis control programme and services are available, this includes quality-assured smear microscopy and directly observed treatment short course. The drugs are supplied free. Voluntary HIV counselling and testing services as well as free antiretroviral treatment (ART) are provided at the ART Unit of the centre. Federal Medical Centre Umuahia was a mission Hospital with name of Queen Elizabeth Hospital before it was taken over by the Federal Government of Nigeria. The Hospital has community Health Department that manages the cases of tuberculosis. It provided the infrastructure, the building, beds and also the human resources while the drugs and investigating equipments are provided by the German- leprosy through the State Ministry of Health. It is the only tertiary Health Facility in Umuahia and the only Federal Health Facility in Abia State.

The study was retrospective in nature and involved review of the medical records of all pulmonary TB patients seen between January 1 2009 and December 31 2010 in the DOT centre of the Federal Medical Centre Umuahia, Abia, Nigeria**.** Data was collected from the DOTS treatment register and the Umuahia North Local Government Area tuberculosis quarterly summary sheet for the period. All the cases of tuberculosis were counseled and screened for HIV and the result recorded. Screening for HIV status using enzyme linked immunosorbent assay (ELISA) was carried out after pretest counseling and positive results were confirmed by Western Blot.

Three sputum samples for the Ziehl-Neelsen test was produced by the patients of which two were "on the spot" and supervised and the last was produced early the following morning.

The definitions of the treatment outcomes used were as follows; Cured: A patient who was smear positive at diagnosis, who completed 6 or 8 months and who is smear negative at the end of $6/7^{th}$ month of therapy and at least one previous occasion. Treatment Completed: A patient who were smear–positive at diagnosis and completed treatment but smear result not available at end of treatment or all smear negative and Extra-pulmonary who completed treatment. Success: The sum of cured and treatment completed Treatment failure: Any patient who remains or become again smear positive at the end of 5^{th} month or later during Chemotherapy. Died: Any patient who dies for any reason during the course of the treatment. Defaulter: Any patient who has failed to come for Dots for 8 consecutive weeks or more after the last attendance during the treatment Transferred out: A patient transferred to another treatment centre in another State

The data was collected with Excel sheet and the variables collected were Sex, Age, Pretreatment weight, Treatment Category, Laboratory results and treatment outcomes.

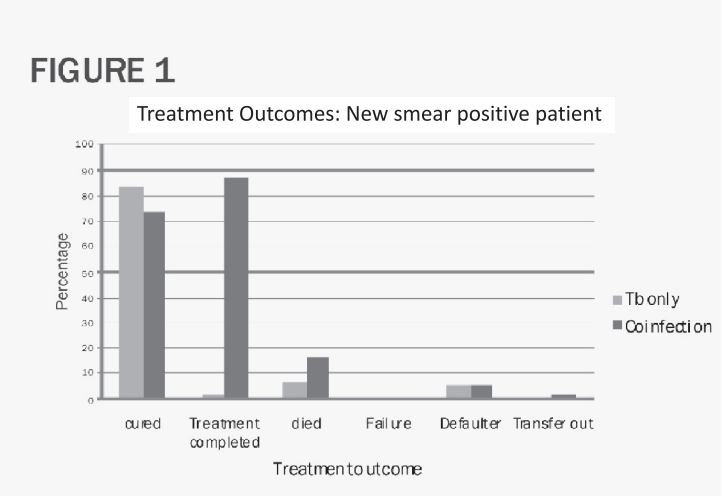
The data collected was analyzed with Microsoft Excel 2007and Epi-info 6 statistical software, p values < 0.05 were considered significant. Chi Square was used for the statistical inference.

The study procedures were approved by the Ethical Review Committee of Federal Medical Centre, Umuahia with assigned Number FMC/QEH/G.596/Vol.4/016

RESULT:

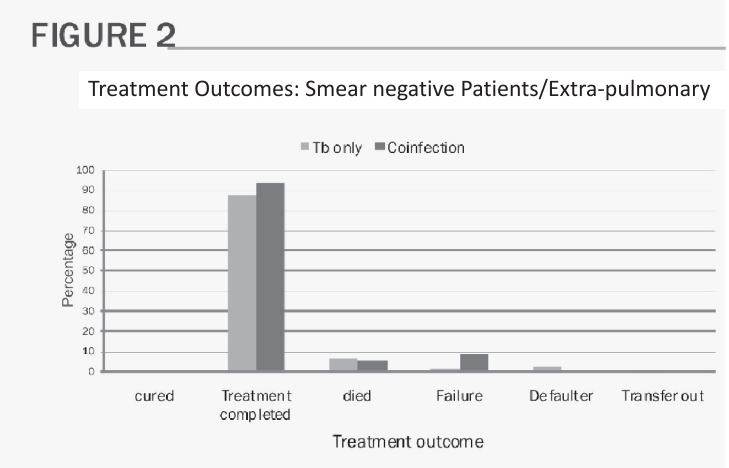
Total number of TB patients was 575. Co-infection 126(22%),Total new smear positive 293(51%), TB + only 53% while co-infection + 42%, TB negative 31% and Co-infection 38%. Total TB 163 in 2010 co infection 64 more males for both TB 100(61%) co infection 63 (56%) p .6. Age group 24-35 Tb 52 (32%), Co-infection 20(31%) p .005. Weight 38-54 TB 71(44%), Co-infection 37 (58%) p.09. Category one 124(76%), Co-infection 52 (81%) From outside LGAs TB (56%), Co infection (72%) Other States TB(9%),

FIGURE 1



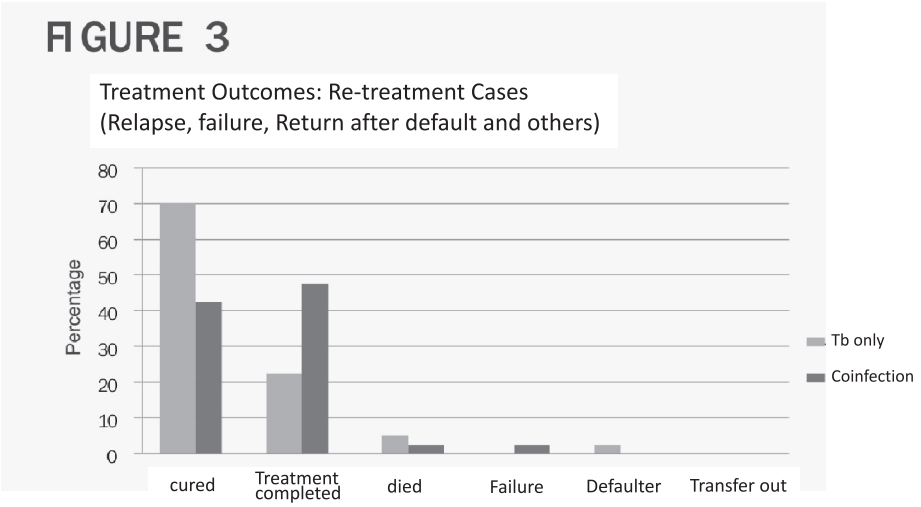
Cure rate for New Tb smear positive 83%, co-infection 74%, Mortality rate New TB 7% and co-infection 17%

FIGURE 2



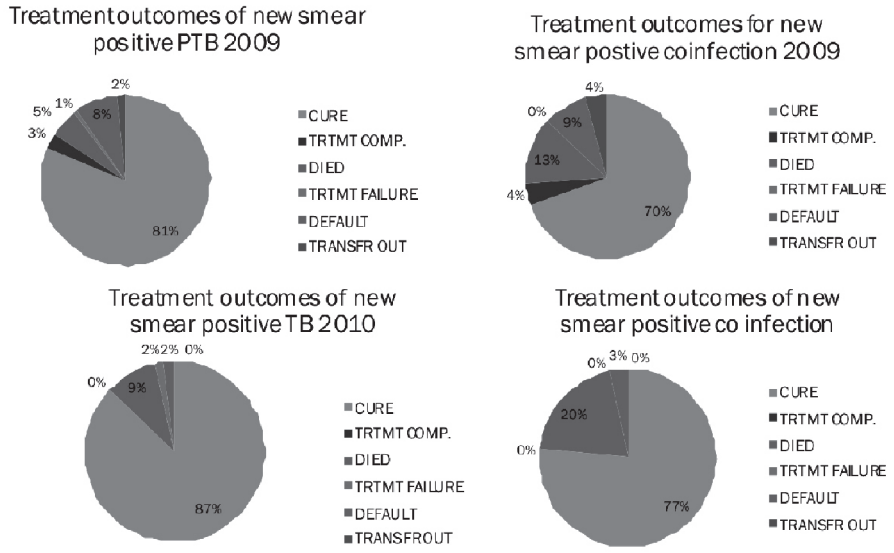
The treatment outcomes in the smear negative patients and extra-pulmonary TB showed reduction in the treatment completed and higher mortality in patients with TB only than co-infection but not significant. However the failure rate was higher in co-infection.

FIGURE 3



In the re-treatment cases of tuberculosis the treatment outcome showed a lower cure rate in the co-infection. The patients that completed their treatment were higher in co-infection. Mortality rate was slightly lower in co- infection than TB only. The failure was higher in co-infection

FIGURE 4 Comparison of treatment outcomes between 2009 and 2010



Cure rate for new smear positive was better in 2010 than 2009 T B only was 81%in 2009 while in 2010 87% in co-infection 70% in 2009 and 77% in 2010. However there was higher death rate in 2010 in both TB only and co-infection. TB only death rate was 5% in 2009, 9% in 2010 and Co-infection 13% in 2009 and 20% in 2010.

TABLE 1

Success Rate in TB and co-infection

Cases	TB only	Co-infection	P value
New smear positive	204(85%)	40 (75%)	.02
Smear negative / Extrapulmonary	133(88%)	47(94%)	.35
Retreatment	54(93%)	21(91%)	1

For the new smear positive patients the success rate was better in HIV-negative TB 85% than HIV-positive TB 75%.

Discussion:

The TB/HIV co-infection rate found in this study was similar to the reports by Ige and Oladokun who obtained a prevalence of 23.2% in a hospital based study conducted in the southwest of Nigeria[9] but lower than 38.4% found by Mukhtar in northwestern Nigeria[10]. It is also similar to the findings by Fennier et al in Switzerland Europe who had a seroprevalence of 26.3%[11] but higher than 7.2% found by Vijay et al. in South India Asia[12].

The high HIV sero-prevalence among TB patients documented in the present study may be attributable to the fact that the study centre serves as the major free specialist HIV referral centre for many states in South Eastern and South Southern part of Nigeria. Likewise, with the screening of HIV infected patients for TB and TB patients for HIV, there was better detection rate of co-infected cases.

The cure rate in HIV negative smear positive TB cases in this study as shown in fig. 1 is slightly lower than WHO recommendation while the success rate as (Table 1) was the same as minimum recommendation by the World Health Organization and the Nigerian National target[13]. HIV/TB co-infection success rate is similar to the result reported from the study in India done on HIV/TB co-infection patients where a success rate of 75% was found [12]. Likewise, a study done in Ibadan southwestern Nigeria had a success rate of 74.4%[9].However, this is much better than the result in Kumasi Ghana which only achieved 44% cure rate because of the problem of Multi-Drug Resistance[14]. The studies carried out in northern Nigeria still showed lower cure rates than seen in this study.
Cure rates of 40% and 62.4% were documented in Kano and Kaduna states Nigeria respectively [10, 15]. The low cure rates has public health implication, this may lead to Multi drug resistance which will result in the primary MDR-TB. The MDR-TB will lead to use of second line drugs which are not readily available and has serious side effects. The emergence of MDR-TB will pose a serious challenge to the control of tuberculosis.

The treatment outcomes between HIV negative TB patients and HIV-positive TB patients were

compared in this study. It was found that the cure rate was reduced and the mortality rate increased in TB/HIV co-infection(7% versus 17%) and it was statistically significant.However the difference in all other outcomes, treatment completed, failure, defaultand died were not statistically significant(Fig 1) . Similarly, in a study done at the Olabisi Onabanjo University Teaching Hospital, Sagamu, south western Nigeria, The cure rate was significantly lower in HIV infected compared with non-HIV infected TB patients (60.3% v 80.0%;p = 0.0001). Overall mortality was 5.1% which was significantly higher in HIV positive compared to HIV negative TB patients (15.5% v 3.1%; p = 0.00007). On the whole, 17% defaulted treatment and 1.1% failed treatment. These were however not significantly related to HIV status [16].

The study also showed (Fig 4) better cure rate in 2010 than 2009. The same was observed in Ghana with better outcome in subsequent years [14] this may be due to improved management of patients. It could also be due to early detection, availability of drugs and awareness creation through health Education. There could be more financial support especially for HIV which is also used for TB by the agencies and Federal Government.

A Limitation of the study was the retrospective nature of study where some data could not be retrieved and this limited the period of the study and the extent of analysis

Conclusion and Recommendation: Mortality rate was higher in co infected cases and the cure rate reduced resulting in poor treatment outcomes. Although the cure rate improved in 2010 early detection and prompt treatment especially for co infection where the cure rate was much lower and death rate was high is paramount. It is therefore imperative to reduce the co infection by preventing HIV patients being infected with TB. This can be achieved with infection control especially among HIV patients, intensive searching of cases of co-infection with prompt treatment with both anti-TB and retroviral drugs and Isoniazid preventive therapy.

Competing Interest: The authors declare no competing interest.

Approval by the Authors: The authors approved the publication of the manuscript.

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