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Retro-Viral Disease Status of Patients on DOTS Tuberculosis Treatment Strategy in a South-East Nigeria Teaching Hospital

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Abstract

Introduction: Tuberculosis is associated with HIV/AIDS and it has been recognized as one of the most frequent opportunistic infections in persons with HIV. Tuberculosis is the leading cause of death in people with HIV having an adverse effect on HIV progression. **Objectives**: The objective is to determine the retroviral disease status of patients on the DOTS strategy. **Materials and Methods**: A retrospective study of patients was seen at the University of Nigeria Teaching Hospital from January 2013 to April 2015. Relevant information was collected from patients' folders. Statistical analysis was done with the SPSS and results were represented in tables. **Results**: 171 patients (77%) were HIV negative while 51 (23%) were positive giving an HIV negative/HIV positive ratio of 3.35:1. 97 patients (43.7%) had 6 months duration of treatment. The least was 2 patients (0.9%) that complied with their medication for 7 months. The 61 - 70 years age group accounted for the least number of HIV-positive patients. **Conclusion/Recommendations**: There is strong tuberculosis/HIV co-infectivity among the studied population. Strategies to reduce the burden of TB/HIV co-infection should be strengthened.

Keywords

Retroviral Status, Patients, DOTS, Tuberculosis, South-East Nigeria

1. Introduction

Tuberculosis, an infectious airborne disease affects all countries with 85% of cases occurring in Africa and Asia. Globally there are 22 High Burden Countries

(HBC) that account for 80% of the world's TB cases. Nigeria ranks 10th among these 22 HBC around the world and 4th in Africa [1].

Tuberculosis is associated with HIV/AIDS and it has been recognized as one of the most frequent opportunistic infections in persons with HIV due to compromised immunity of such persons [2] [3]. The recurrent epidemic of HIV in many African countries has increased the burden of tuberculosis many folds. Tuberculosis is the leading cause of death in people with HIV and also has an adverse effect on HIV progression. HIV infection has been identified as the highest risk factor that triggers the reactivation of latent infection with TB [1]. It is always of best practice to rule out HIV in patients with active tuberculosis. This would assist the health care provider in the management of the disease, especially considering antiretroviral therapy.

WHO adopted the Directly Observed Treatment Short course (DOTS) strategy in 1990 with Nigeria taking clue in the year 1993. Despite this, Tuberculosis has not been effectively controlled. It becomes even more difficult with Tuberculosis/HIV co-infectivity [3] [4]. The idea behind DOTS is that the affected patient takes his anti-tuberculin drugs under the strict supervision of a trained observer especially in the intensive phase of the treatment. This could be achieved either by the patient going to the clinic to take the drugs or an observer going to the patients house. This is done in order to reduce and prevent relapse as well as issues of multi-drug-resistant tuberculosis. The introduction of DOTS since 1990 has seen a 47% drop in the death rate of TB patients [5] showing that the strategy is effective globally.

This study, therefore, was conducted to determine the retroviral status of patients on DOTS tuberculosis treatment at the Chest Clinic UNTH from 2013-2015. Patients with both HIV and TB are at least 10 times more likely to develop active TB than someone without HIV [4].

2. Study Objectives

The General Objective was to determine the retroviral disease status of patients on DOTS Tuberculosis Treatment in Nigeria using chest clinic old UNTH as a case study while the specific objectives were to determine the effectiveness and success rates of DOTS TB, to find out the duration of treatment of the patients and to find out the relationship between Age and Retroviral Disease status of patients on the treatment.

3. Materials and Methods

3.1. Study Area

The study was conducted at the chest clinic of University of Nigeria Teaching Hospital, Enugu. Enugu is the capital of Enugu state and has an estimated population of 3.8 million [6] [7].

The Chest Clinic, run by the Community Medicine Department UNTH runs every Monday, Wednesday, and Friday with an average attendance of 15 - 20 pa-

tients per week.

3.2. Study Design

The study was a retrospective study of patients that were seen at the UNTH chest clinic from January 2013 to April 2015. Patients' folders were retrieved from the medical records and relevant information obtained for the study.

3.3. Study Population

The study population was patients (both male and female) that attended the chest clinic of UNTH within the stated period.

3.4. Sample Size Determination

Based on a previous and related study, the sample size was derived using the formula

$$N = Z^2 P(1-P)/D^2$$

where N is the normal/sample size for the study,

P = 64% (compliance rate in Nepal by Shiyalap 2013) [8].

Z = 1.96 at 95% confidence limit.

D (sampling error) = 5% (0.05) which is the tolerance error or margin of error tolerated.

$$\begin{aligned} N &= 1.96 \times 0.64 \times (1-0.64)/0.05^2 \\ &= 1.2544 \times 0.36/0.0025 \\ &= 180.4 \\ &= 180 \text{ (minimum sample size)} \end{aligned}$$

This comes to 200 after accommodating for attrition and approximating.

Sample size used in this study is 222 patients.

3.5. Statistical Analysis

Statistical analysis was done with the statistical Package for the Social Sciences (SPSS) and results presented in tables.

4. Results

Table 1 shows that patients' ages ranged from 2 years to 85 years with a mean age of 38 years. The 21 - 30 years age group was the most commonly represented with 71 patients (32%) and the >80 years groups were the least represented with 2 patients (0.9%).

Table 2 reflects that 171 patients (77%) were HIV negative while 51 (23%) were HIV positive giving an HIV negative versus HIV positive ratio of 3.35:1.

In Table 3, here the duration of treatment also varied among patients, with 97 patients (43.7%) taking their treatment up to 6 months. The least was 2 most patients (0.9%) that complied with their medication for 7 months.

Table 1. Social demographic characteristics of studied populations.

Age (years)	Frequency	Sex		Marital status			Formal Education	
		Male	Female	Single	Married	Widowed	Yes	No
1 - 10	6	2	4	6			2	
11 - 20	23	9	14	22	1		9	
21 - 30	71	28	43	52	18	1	28	
31 - 40	49	34	15	23	26		35	
41 - 50	36	24	12	3	34		25	
51 - 60	21	13	8	2	18	1	13	
61 - 70	11	7	4	2	9		6	1
71 - 80	3	1	2	1	2			1
>80	2	1	1	1		1		1
Total	222	119	103	112	107	3	118	3

Table 2. Retroviral disease status of patients using dots TB.

RVD Status	Frequency	Percentage	Ratio
Negative	171	77	3.15
Positive	51	23	1
Total	222	100.0	

Table 3. Duration of treatment of patients using dots TB.

Duration of treatment	Frequency	Percentage
1 mth and less	47	21.7
2 mths	25	11.3
3 mths	12	5.4
4 mths	16	7.2
5 mths	16	7.2
6 mths	97	43.7
7 mths	2	0.9
8 mths	4	1.8
12 mths	3	1.4
Total	222	100

Table 4 is on the outcome of treatment where 92 patients (41.4%) were successfully treated and discharged home with 7 patients (3.2%) patients referred to other centres. Interestingly 11 patients (4.9%) completed their treatments though did not show up for discharge while another 3 (1.4%) had a relapse. Furthermore, 89 patients (40.1%) received treatment with unknown outcome and 17 patients (7.7%) unfortunately died; 3 (1.4%) patients were still on treatment.

In Table 5, it is found that 51 (23%) of the 222 patients were HIV positive

Table 4. Outcome of treatment of patients using dots TB.

Outcome of treatment	Frequency	Percentage
Referred	7	3.2
Discharged	92	41.4
Didn't show up for discharge	11	4.9
Still on treatment	3	1.4
Dead	17	7.7
Unknown	89	40.1
Relapse	3	1.4
Total	222	100.0

Table 5. Relationship between age and RVD status of patients using dots TB.

Age (years)	RVD STATUS		
	Negative	Positive	Total
1 - 10	1	5	6
11 - 20	20	3	23
21 - 30	59	12	71
31 - 40	34	15	49
41 - 50	16	20	36
51 - 60	16	5	21
61 - 70	10	1	11
71 - 80	3	0	3
>80	2	0	2
Total	171	51	222

RVD: Retroviral disease.

with 20 patients (39.2%) belonging to the 41 - 50 years age group. The 61 - 70 years age group accounted for the least number of HIV patients.

5. Discussion

Tuberculosis control programs currently emphasize the DOTS Strategy, promoted by World Health Organization (WHO) and the International Union against Tuberculosis and Lung Disease (IUATLD) [9] [10].

This study involved the review of 222 folders of patients, out of which 119 (53.6%) were males and 103 (46.3%) female. 92 patients (41.2%) seen in the period of the study were successfully treated and discharged as cured.

107 patients were non-compliant to treatment and 17 (7.7%) of these died, who were HIV positive patients. This is consistent with the findings of Amoran *et al.* who noted that the HIV-positive patients that were non-complaint with medications also died in his study in Ogun State, Nigeria [11].

Most of the patients were HIV negative 171 (77%) while 51 (23%) were HIV positive which is also almost consistent with the findings of Amoran *et al*., who noted 73.9% (HIV negative) and 26.1% (HIV positive) in a study done in Ogun State [11]. This indeed reflects a strong association between tuberculosis and HIV infection. In this study, there was no assessment of the extent of immunosuppression among HIV-positive patients. Tuberculosis patients with HIV disease though however may not have been recognized as such have a number of intense sequelae including but not limited to delayed diagnosis, delays in treatment and faster progression to untreatable Tuberculosis [12]. It is worthy of note that symptoms that Tuberculosis patients with HIV co-infectivity presents do not usually follow the stereotyped fashion of cough for more than three weeks, etc. [13]. Culture of mycobacteria remains the gold standard for diagnosis of tuberculosis and is now routinely recommended to assist tuberculosis diagnosis in HIV patients, though more cumbersome and of course, more expensive [14].

One hundred and seven (41.3%) of the 222 patients did not complete the duration of their treatment. The default was highest at 2 months; 21 (9.5%), which is almost consistent with the findings of Amoran *et al.* who noted a default rate of 12.6% at the 2nd month in their study. This could be attributable to ignorance of the weighty consequences of a treatment failure or advent of drug-resistant tuberculosis, difficulty in coping with the side effects of the drugs (especially which may be more pronounced with patient on anti-retroviral medication). The default rate here (41.3%), however, is not consistent with the findings of Inotu *et al.* that obtained a default rate of 23.8% in their study in Benin City, Nigeria [15].

In this study, 17 patients (7.7%) died while there was relapse in 3 patients (1.4%). However, it was not expressly captured if these mentioned subsets were HIV positive. This is somewhat similar to a previous study done in Ethiopia where 74 patients (9.9%) had unsuccessful treatment outcomes (death and treatment failure) [16].

6. Conclusions and Recommendations

The exact cause of death in the studied population could not be ascertained. There is, however, obviously strong tuberculosis and HIV co-infectivity among the studied population.

Strategies to reduce the burden of TB/HIV co-infection should be strengthened, while the two-way referral system should be made stronger for enhanced treatment adherence.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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