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Tuberculosis and HIV co-infection among patients attending directly observed treatment short course (DOTS) in Lagos, Nigeria

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ABSTRACT

A prospective study to assess the outcome of the directly observed treatment short course (DOTS) in tuberculosis patients with HIV co-infection was conducted in Ojo Local Government in Lagos, Nigeria. This study was carried out to determine the prevalence of HIV/TB co-infection among tuberculosis patients in DOTS centre in Lagos. This study was carried out between January 2013 and August, 2014 in Ojo Local Government (DOTS) centre, in Lagos, Nigeria. Five hundred and nine (509) DOTS attendees (270 females and 239 males, age-range 10-70 years of age, at the Ojo and Okoko health services centre. Samples of sputum and blood were collected and processed using standard laboratory procedures. All the patients' sera were screened for antibodies for HIV¹/₂ using three rapid ELISA kits. Sputum was examined for presence of mycobacterium tuberculosis using Ziehl-Nelsen staining method. A total of one hundred and twenty eight (25.1%) of HIV infection among diagnosed TB patients. HIV/TB co-infection positive patients for male and female were 25.6% and 24.8% respectively there is no significant difference ($p > 0.05$). According to age, the prevalence in age group 15-24 years and 25-34 years were higher in female 20.0% and 30.4% while male were 14.2% and 27.6% respectively but in age 35-44 years the prevalence was higher in male 21.8% while female was 15.2%. There was statically significant difference as regards the age related prevalence rate ($P < 0.05$). Early diagnosis and proper treatment monitoring condition must still be viewed with great concern with serious public enlightenment campaign efforts to eradicate these twin devastating diseases.

Keywords: Tuberculosis, HIV/AIDS, co-infections, chemotherapy DOTS, Nigeria

INTRODUCTION

Tuberculosis is an air borne infection caused by the tubercle bacillus mycobacterium tuberculosis [1]. It is a global health priority being a killer disease that manifests in its pulmonary form in up to 70% of cases or as extra pulmonary affecting all parts of the body [2]. Nigeria as the most populous country in Sub-Saharan Africa carries the highest burden of tuberculosis and has placed it among the top five of the WHO 22 high burden tuberculosis countries [3]. Available data reported 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 in Nigeria [4]. A study in Calabar, Cross

River State, Nigeria also recently showed no decline in the intensity of the disease in spite of DOTS [5]. Globally Sub-Saharan Africa has the highest rate of tuberculosis as well as HIV/AIDS [3]. Today almost 70% of those co-infected with tuberculosis and HIV/AIDS live in Africa. The high rates of human immunodeficiency virus acquired immunodeficiency syndrome (HIV/AIDS) have caused a sharp rise in the prevalence of tuberculosis [6], for example in Kenya, the number of new TB cases is increasing at the alarming rate of 12% each year. In Nigeria, Ethiopia, and South Africa the rate is increasing at 7% annually. Globally, the rate of new T.B infection is about 9% but is as high as 31% in regions and countries with high rate of HIV infection [6]. While the prevalence of HIV infection among TB patients also varies from country to country, the highest rates have been reported in areas where HIV prevalence is high in the general population. For example a high co-infection rate of 44% - 52% has been reported in Kenya [7], while a lower co-infection rate of 8.8% was obtained in southern California, USA. Since the first case of AIDS was reported in Nigeria in 1986, the rate of HIV infection among pregnant women attending ante natal clinics steadily increased from 0.6% in 1987 to 5.8% in 2003. Although, the 2010 national sentinel survey showed that the rate of HIV infection has declined to 3.4% [8], the prevalence varies by location from 2.1% and 2.9% in the north central and south western zone respectively to 7.5% in the north central zone. The rate of the infection is higher among some other groups/population, especially the high risk group [8-10]. The year 2000 national survey among TB patient showed a median HIV prevalence rate of 17.0% with the highest and lowest rates of 35.1% and 4.2% in Benue state and Oyo state respectively. The effect of HIV-TB co-infection is bidirectional and synergistic/aggravating [6]. HIV infection compromises the immune system which in turn increases the risk of acquiring TB. On the other hand, the course of HIV infection is often accelerated subsequent to infection with TB [11]. Hence, the risk of death and development of other opportunistic infections is higher in HIV-TB co-infection [12, 13]. It is relevant to evaluate the efficacy of DOTS regimen for tuberculosis in patients with HIV co-infection in a resource limited country like Nigeria where TB is a leading cause of death. This is of particular importance to Global HIV control programme. It is in line with these needs that the present study was conducted for the first time in Lagos, an area in south west, Nigeria with particular emphasis on evaluating the assessment of DOTS regimen and the outcome of sputum smear positive pulmonary tuberculosis patients with the HIV co-infection attending the infectious diseases health centre in Lagos, Nigeria for a period of 20 months (Jan, 2013 to August, 2014).

MATERIALS AND METHODS

2.1 Study Area and Population :The study area was Ojo Local Government in Lagos. Ojo is a town and Local Government Area in Lagos with population of 598, 071. It located at latitude 6° 28N and longitude 3° 11^E of Lagos State.

2.2 The Health DOTS centre for the study :The study was carried out between January, 2013 and August, 2014 at the infectious disease Health Directly Observed Treatment Short Course Centre (DOTS), Lagos. It was the main Lagos State Government Official Health Centre and General Hospital designed to treat and manage infectious diseases. All tuberculosis and HIV/AIDS related medical care are provided free of charge to the patients at the health centre or at General Hospital.

2.3 Subjects for the study:The subjects were both male and female patients that presented to the chest clinic with symptoms of pulmonary tuberculosis based on the history and clinical examination and whose initial sputum smears demonstrated Acid Fast Bacilli (AFB) by direct smear sputum on microscopy using Ziehl- Nelsen stain at least on two occasions in line with the recommendations of WHO [14, 15].

2.4 Methodology: Health workers providing care at the DOTS centre in Lagos State were trained to provide comprehensive points of care HCT to patients accessing care for TB in the clinics. All patients who attended the DOTS centre from January 2013 to August 2014 were tested for HIV infection by using determine “Unigold and stat-pack” rapid test Kits in a serial algorithm.

2.5 Treatment Outcome:Treatment outcomes as recommended by WHO and the IUATLD, and adapted in Nigeria [16-18] were categorized as cured, treatment completed, treatment failure/MDR, died, defaulted or transferred out. A patient was considered as “Cured” if a negative sputum smear (without AFB) was obtained in the last month of treatment and at least one previous occasion. A patient was considered as having “completed treatment” If treatment had been completed and smear examination results were available at the end of the treatment. “Treatment failure/MDR.TB” was marked by becoming AFB sputum positive again at least five months after the commencement of treatment A “defaulter” was a patient who did not return to collect the antituberculosis for

8weeks or more after the date of the last attendance during the course of treatment. A “Transferred out” was defined as a patient who was transferred to another reporting unit area for whom the treatment result was unknown [19]. Death was reported for patients who died during treatment regardless of course.

Table1: Sex distribution and HIV Status among TB patients for the period of study

Gender	2013		HIV	2014	
	HIV positive (%)	HIV negative (%)		HIV positive (%)	HIV negative (%)
Male	138(46.3)	30(21.7)	108(78.3)	101(47.9)	24(23.7) 77(76.3)
Female	160(53.7)	44(27.5)	116(72.5)	110(52.1)	30(27.3) 80(72.7)
Total	298(100)	74(24.8)	224(75.2)	211(100)	54(25.6) 157(74.4)

Table2:Age Distribution of TB patients

Age range	Male N=239 Frequency (%)	Female N=270 frequency (%)	Total N=509 frequency (%)
< 10	14(5.9)	12(4.4)	26(5.1)
10-24	20(8.4)	23(8.5)	43(8.4)
15-24	34(14.2)	54(20.0)	88(17.3)
25-34	66(27.6)	82(30.4)	148(29.1)
35-44	52(21.8)	41(15.2)	93(18.3)
45-54	30(12.6)	28(10.4)	58(11.4)
55-65	15(6.3)	21(7.8)	36(7.1)
>65	8(3.3)	9(3.3)	17(3.3)
Total	239(100)	270(100)	509(100)

$X^2 = 7.2$, $df = 7$, p -value = 0.5051.

Table3: DOTS Treatment Outcome of TB/HIV Sero positive patients in Lagos, Nigeria (2013-2014)

TB Treatment Outcome	cured	MDR OR Relapsed	Transfer	Completed	Default	Death
No of HIV/TB Patients N = 509 (100%)	258(51)	28(6)	14(2)	138(27)	32(6)	39(8)

MDR = Multi Drugs Resistant

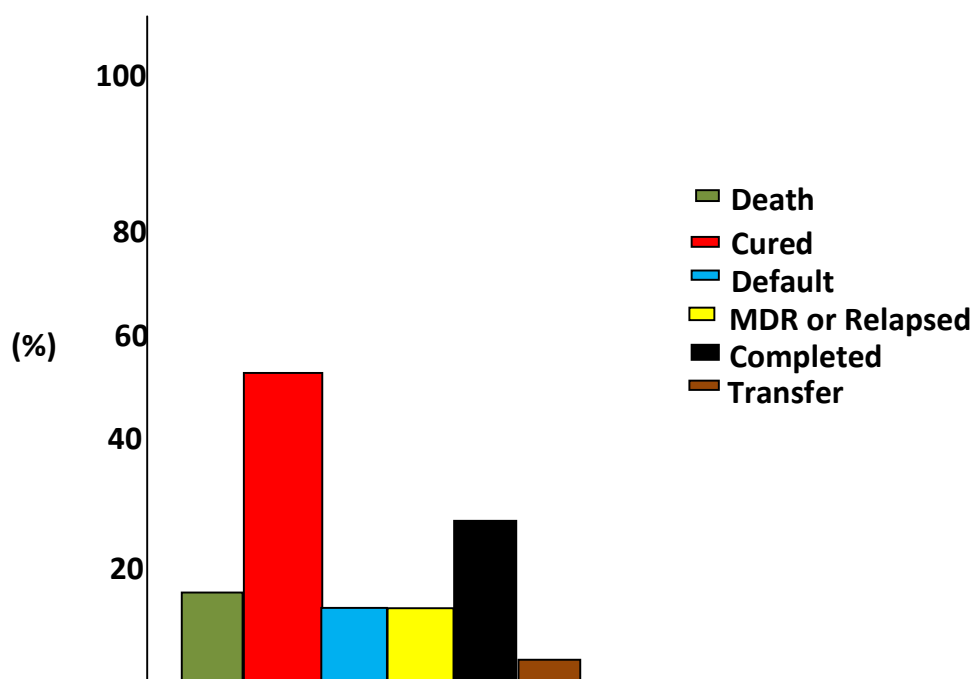


Figure1: Treatment outcome of HIV/TB

RESULTS

A total of 509 TB patients were reported at D-super medical laboratory DOTS centre in Ojo Local Government, Lagos between January 2013 to August 2014. Out of which 128 (25.1%) were HIV positive giving an overall prevalence of HIV infection among diagnosed TB patients.

There was no significant difference in the number of TB cases seen over the years (Table1). Similar rates of HIV infection were obtained 24.8% and 25.6% in year 2013 and 2014 respectively in this study. Table2 shows age distribution of TB patients. Age range between 10-65years, the age 25-44years had the

highest incidence of 49.4% and 45.6%, male and female respectively while the lowest was recorded in the age group above 65years, 3.3% each male and female respectively. There is however no statistical significance difference between age and TB incidence (P-value = 0.5051, table 2). The number of cured patients 258(51%), relapsed or MDR 28(6%), transfer 14(2%), completed 138(27.1%), default 32(6%) while death cases was 39(8%) (Table3).

DISCUSSION

The results of this work show a high burden of HIV/TB co-infection in Lagos state, southwestern Nigeria the overall prevalence of HIV infection among diagnosed TB patients was 128(25.1%) is higher than previously reported among this category of patients in the state [20]. The national survey of HIV infection among PTB patients conducted in 2000 showed that the rate of HIV/TB co-infection was 21% in Lagos state. Although samples used in that national sentinel survey was collected from only two health facilities which were not DOTS centre and within 8weeks unlike the current study that was carried out over a period of 2years and from DOT health facilities in the state[21]. TB/HIV incidence was slightly higher in the females compared to the males with a statistical significance. This is in contrast with a previous study [22] where there was no sex difference. Some studies however recorded a slightly higher male population than that of the female, [23, 24] HIV infection is known to compromise the immune system thereby increasing the rate of acquiring tuberculosis [21, 25]. The treatment of tuberculosis especially when complicated by HIV seems to be difficult even with DOTS therapy [4, 26]. The success rate of 51% obtained from this study is less than the global targets of 85% [4, 20]. However, this can be considered to be impressive in view of the much lower success rates recorded before the introduction of the DOTS programmes. Slightly greater success

was reported in one study in Sagamu southwest Nigeria 76.8% cure rate was found [4]. In this study the 51% was greater than the previous result obtained in Ilorin 43.7% (18) and in Calabar 42% cure rate was found [3]. Many countries are failing to achieve adequate treatment outcomes due to patients default, transfer, and re-infection and in some cases high death rates [27].

A high incidence of HIV (25.15%) co-existence with TB showing a close association between the two infectious disease was recorded in this study. This finding differ from a study [24] where the incidence of HIV/TB co-existence was 9.6% but similar to that of the national HIV infection rate among adult TB patients in Nigeria which was also estimated to be 27% by the WHO [3]. States like Borno, Plateau and Benue were also reported by the federal ministry of health to have HIV/TB prevalent rate of 27%, 30%, and 35% respectively [28]. Tuberculosis resurgence has been attributed significantly to HIV infections, poverty and social deprivation [29] and WHO estimated that nearly ten percent of new TB patients are HIV positive [30].

CONCLUSION

The rate of HIV infection among patients diagnosed with TB in Lagos state, Nigeria is remarkable higher than previously reported. The rate of TB/HIV co-infection among female patients and children was remarkably high. These are important factors that should be considered in the planning of intervention measures in the country as well as in other countries where both infections are endemic. Co-existence of TB and HIV was statistically insignificant. Tuberculosis incidence is still very high and alarming and needs every form of possible aggressiveness. It must be viewed with great concern with serious public enlightenment campaign efforts to eradicate these twin devastating diseases.

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