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Prevalence of Tuberculosis (Tb) and HIV Infection In Imo State, Nigeria.

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Abstract

The prevalence of tuberculosis (TB) was dwindling until the Human Immunodeficiency Virus (HIV) infection and Acquired Immune Deficiency Syndrome (AIDS) epidemic started. There have been reported cases of association of TB caused by *Mycobactetium tuberculosis*, with HIV infection. The purpose of this study was to find out the prevalence of TB and HIV infection among people from Orlu in Imo State, Nigeria and augment information on the association of TB and HIV infection. During the period of August 2004 to September 2005, test samples were collected from both male and female respondents from Orlu aged one year to sixty years and examined for TB and HIV infections. Of 8197 specimens examined, 151 (1.84%) were positive for TB and 121 (1.48%) were positive for HIV infection. The age group with the highest prevalence of TB was 41-50 (3.0%) and the lowest was 1-10 (0.25%). The highest prevalence of HIV infection occurred in 21-30 (2.0%) and 41-50 (2.0%) age groups, while the lowest was in 1-10 (1.23%) age group. The prevalence of TB was slightly more in females than in males (1.86%; 1.82% respectively). This was also the case with HIV infection (females, 1.7 %; males 1.53%). As in previous reports, concurrent infections of TB and HIV were relatively high (6.0%). This study adds to reported cases of association of TB with HIV infection in Nigeria, West Africa, and Sub-Sahara Africa. It also lends credence to the reports that the epidemiology of TB has been profoundly influenced by the epidemic of HIV infection in Sub-Saharan Africa. It justifies the inclusion of TB as an opportunistic infection for HIV along with toxoplasmosis, cryptosporidiosis and *Pneumocystis carinii* infection. It is recommended that similar studies be conducted in the remaining senatorial zones of Imo State.

Keywords: Tuberculosis (TB), Human Immunodeficiency Virus (HIV) infection, Imo State Nigeria

1.0 Introduction

Tuberculosis (TB) is a disease of humans caused by the bacteria, *Mycobacterium tuberculosis*,the human tubercle bacillus. It causes disability and death in many parts of the world. The clinical manifestations are cough, fatigue, fever, weight loss, hoarseness, chest pain and hemoptysis (bloody sputum). Tuberculosis was very rampant in the 1950s and 60s. But there was a downward trend of morbidity and mortality of this disease for many years in many countries of the world, , including Nigeria. But in the past decade, there has been resurgence of its prevalence.

This trend is believed by several investigators in Nigeria and other countries outside Nigeria to be as a consequence of the HIV/ AIDS epidemic. (Hakim *et al.* 2000; Bello and Njoku 2005; Peters *et al.* 2005; Ahidjio *et al.* 2006) This is buttressed by the fact that an increase in tuberculosis cases was reported at the same time as the emergence of AIDS in several countries (DeCock *et al.* 1992; Alikor and Erhabor 2006). Tuberculosis has been reported in various parts of Nigeria. (Bello and Njoku 2005; Ahidjio *et al.* 2006; Peters *et al.* 2005; Orakwe and Okafor 2005; Dosumu and Momoh 2006; Kehinke *et al.* 2006; Ekere *et al.* 2005; Erhabor *et al.* 2006; Lawson *et al.* 2007) A review of available literature does not show any significant publication on its prevalence in Orlu, at least in the past five years.

The first case of Human Immunodeficiency Virus infection/ Acquired Immunodeficiency syndrome (HIV/ AIDS) in Nigeria was reported in 1986. The

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prevalence escalated from 1.8% in 1988 to 5.8% in 2001. A survey conducted in 2003 showed that the national HIV prevalence had dropped to 5% from 5.8% in 2001. However, it was found that prevalence rates in the various states varied from as low as 1.2% in Osun state to as high as 12% in Cross River state. On the whole, 13 of Nigeria's 36 States had an HIV prevalence of over 5% (http://www.avert.org/aids-nigeria.htm). This narrowly excluded Imo State which was reported to be 10% in 1999 and 4.7% in 2001 in Orlu and 5.33% in 1999 and 4.0% in Owerri in 2001. These data were based on pregnant women attending antenatal clinics examined.

Since this report, some further studies have been conducted on HIV/AIDS in Imo State. Acholonu (2005) reported on HIV/ AIDS in Mississippi and Nigeria. In 2006 Acholonu *et al.* reported on trichomoniasis in Imo State, Nigeria with special reference on Orlu Zone and compared its prevalence with several other STDs. One of these was HIV infection. Of 8,439 specimens examined, 1.07% was positive for HIV infection. It was brought out that trichomoniasis, caused by *Trichomonas vaginalis*, is a risk factor for HIV/ AIDS.

There have been several reports on co-infection of HIV and TB or the association of both (Raviglione *et al.* 1992; Harries *et al* 1997; Hakim *et al.* 2000; Ige et al. 2005; Ukaojiofo and Nubila 2006; Daniel and Alausa 2006; Mayosi *et al.* 2006). There are also studies that involved the examination of TB patients for HIV/AIDS (De Cock *et al.* 1992; Harries *et al.* 1997; Daniel *et al.* 2004; Mayosi *et al.* 2006) and HIV/AIDS patients examined for TB (Raviglione *et al.* 1992; Salami and Katibi 2006). The effects in each case were reported. Survival was adversely affected in patients co-infected with tuberculosis and HIV. De Cock *et al*. (1992) indicated that several reports have documented the relation of pericardial tuberculosis and HIV infection with seropositivity being observed in 62-92% of patients. This was said to be more in Sub-Saharan Africa. They further stated that high rates (20% to 67%) of HIV infection in patients with tuberculosis have been reported form East, West, Central, and Southern Africa.The epidemiology of tuberculosishas been profoundly influenced by the epidemic of HIV infection.The purpose of this study was to find out the prevalence of TB and HIV infection among people from Orlu zone of Imo State, Nigeria, the largest of three zones if the State, and to augment published reports on the association of TB and HIV infection in Nigeria, West Africa, and Sub-Saharan Africa at large.

2.0 Materials and Methods

During the period of August 2004 to September 2005, test samples were collected from both male and female respondents from Orlu aged one year to sixty years and examined for tuberculosis and HIV infection. Bacterial diagnosis was carried out. Acid-fast bacilli stains and mycobacterial cultures were conducted from blood allowed to clot. For HIV, serum from each sample of blood allowed to clot was centrifuged to remove traces of erythrocytes and the sera were tested serologically using standard methods.

Figure 1: Map of Nigeria showing Imo State in which Orlu is located

Figure 2: Sentinel Surveillance in Pregnant Women in Nigeria (1996-2001)

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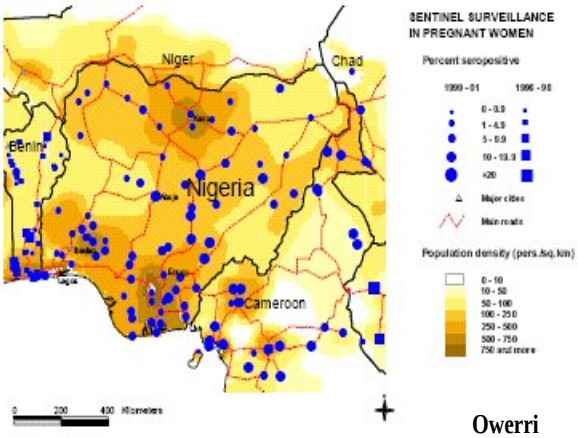

Owerri
Imo

Ref. http://www.avert.org/aids-nigeria.htm

3.0 Results

Of 8197 specimens examined, 151 (1.84%) were positive for TB and 121 (1.5%) were positive for HIV infection. See Tables 1 and 2 and Figure 3 for the rest of the results. They show the following among others: The highest prevalence of TB was in age group41-50 (3.0%) and the lowest was in 1-10 (0.25%). The highest prevalence of HIV infection was in 41-50 age group (1.84%), closely followed by 21-30 years age group (1.64), while the lowest was in 1-10 (1.23%). The prevalence of TB was slightly more in females than in males (1.86%, 1.82% respectively (P value?)). With respect to HIV infection, it is slightly more in females than in males (1.7% and 1.53% respectively (P value>0.05)). The total number of concurent cases of TB and HIV infection was 17 of 283 (6.0%).

Figure 3: Prevalence of TB and HIV by age Group

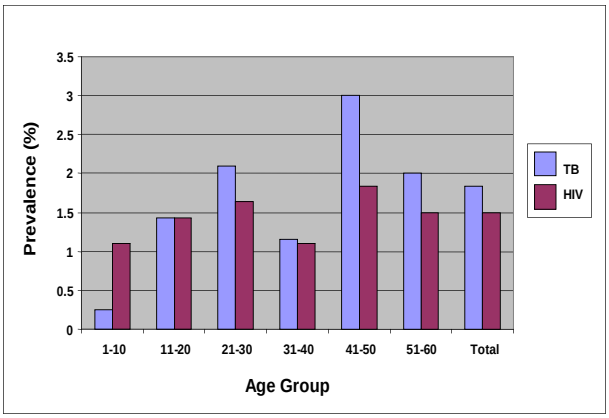

Table 1 Prevalence of TB and HIV infection by Age Group

Age Group %	No. Exam.	No. Posit TB & %	No. Posit HIV confirmed &
1-10	811	2 (0.25)	9 (1.11)
11-20	981	14 (1.43)	14 (1.43)
21-30	1765	37 (2.10)	29 (1.64)
31-40	1567	18 (1.15)	17 (1.10)
41-50	1852	55 (3.00)	34 (1.84)
51-60	1221	25 (2.00)	18 (1.50)
TOTAL	8197	151 (1.84)	121 (1.50)

Table 2: Prevalence of tuberculosis and HIV Infection by sex and age group

Age (Years)	SEX	Number Examined	Number Infected (%) Tuberculosis Sputum Smear positive	HIV Confirmed Positive
1- 10	M	420	2 (0.50)	6 (1.43)
	F	391	0 (0.00)	3 (0.77)
11-20	M	475	5 (1.05)	4 (0.84)
	F	506	9 (1.80)	10 (2.00)
21-30	M	920	21 (2.30)	17 (1.85)
	F	845	16 (1.87)	12 (1.42)
31-40	M	766	10 (1.30)	13 (1.70)
	F	801	8 (1.00)	4 (0.50)
41-50	M	962	24 (2.50)	12 (1.25)
	F	890	31 (3.48)	22 (2.50)
51-60	M	630	14 (2.20)	8 (1.27)
	F	591	11 (1.86)	10 (1.70)
TOTAL		8197	151 (1.84)	121 (1.50)

4.0 Discussion

The age group with the highest prevalence of TB was 41-50 (3.0%) and the lowest, 1-10 (0.25%). This is to be expected. It is generally believed that mortality and morbidity rates increase with age.

The age group with the highest prevalence of HIV infection was 41-50 (1.84%) as was the case with TB, closely followed by 21-30 age group (1.64%) and the lowest, 1-10 (1.2%). This is to be expected as infection of children is usually *in utero* and not sexual and cases are comparatively few.

The total number of concurrent cases of TB and HIV was 17 of 283, (6.0%). If TB patients were isolated and tested for HIV separately as was done by some investigators, the prevalence would have been much higher.

The study shows that TB was practically evenly distributed among the males and females in the population surveyed (1.82% and 1.86% respectively). The difference is minimal, (0.04%) or not significant (P >0.05).

With respect to HIV, it was slightly more in females than in males (1.7% and 1.53%). So the difference is not significant (P >0.05). This prevalence is not as high as expected. This may be due to the fact that this was involved by a random selected group.

It is apparent that Nigeria is similar to a number of other African countries (e.g. Malawi (Harris *et al.* 1997) and Ivory Coast (Cote d'lvoire) (De Cock *et al.* 1992) in having an escalating TB related HIV infection epidemic. There are reports on this situation in several parts of Nigeria which include Ibadan (Ige *et al.* 2005); Shagamu (Peter *et al.* 2005); Calabar(Daniel and Alausa 2006); Ife Ife (Erhobor *et al.* 2006); Enugu (Ukaojiafo and Nubila 2006); Delta (Alikor and Erhabor 2006); Ilorin (Salamiand Katibi 2006); Abuja (Dosumu and Momoh, 2006); Ibadan (Kehinde *et al.* 2006). Also Dan Onyejekwe, MD (2007) of the Nigerian Institute of Medical Research (NIMR) made this observation from his personal experience with HIV and AIDS patients in Lagos, Nigeria. (Pers. Comm.)

There was a downward trend of mortality and morbidity of TB for many years in several countries ere the HIV epidemic (Benson 1975). But, there has been a major increase in the prevalence of TB in the past decade or more, largely as a result of the HIV epidemic (Hakim *et al.* 2000). Remedial measures to control this should be stepped up before it goes back to what it was previously. "Greatly increased human and natural resources are required for this neglected problem in international health (ref. JAMA Vol. 268 NO. 12, September 23, 1992).

As previously stated, this study was conducted in Orlu Zone of Imo State. It is recommended that a similar study be conducted in Owerri and Okigwe Zones of the state to assess the situation in those areas. Autopsies in Abidjan, Ivory Coast (Cote d'lvoire) that showed TB is most frequent opportunistic infection in patients dying of AIDS; that there

has been a greatly increased mortality rate in HIV associated TB (DeCock *et al.* 1992). Survival is adversely affected in patients co-infected with tuberculosis and HIV. HIV/AIDS people with TB are at a higher risk of dying than those without it. It is, therefore, recommended that all HIV infected patients be screened for TB and if positive, be treated to prolong their lives Habuim *et al.* (2002), said.

Based on the results of this study, it can be inferred that there is a downward trend in the prevalence of HIV infection in Orlu even though the subjects examined in this study differ from those reported in the sentinel surveillance of 2001 (only pregnant women surveyed). (An examination of the results of the surveillance of 2003 shows that Imo State was not included. This is made more plausible by the fact that Acholonu *et al.* (2006) recorded a prevalence of 1.07%. This was apparently brought about by the campaign mounted by the Federal and State governments of Nigeria against HIV/AIDS as well as Non-Governmental Organizations (NGOs). But the fight against HIV/AIDS is far from over and the efforts to control it should be continued relentlessly until the battle is won. Control measures should be intensified through what one of us (Alex D.W. Acholonu) called project DELTA. DELTA (doing everything locally to stop AIDS) project. That is, work on this from grass-root level areas, from local government areas rather than concentrating on urban or township areas of the country.

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