TUBERCULOSIS IN A NIGERIAN MEDIUM SECURITY PRISON

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ABSTRACT

Introduction: Prisons worldwide have been cited as reservoirs for tuberculosis and also an ideal setting for interventions but little is known about the epidemiology and control of tuberculosis in Nigerian Prisons.

Objective: To determine the prevalence of tuberculosis, role of prison in its control and the mortality from tuberculosis among prison inmate in Kuje prison, Abuja, Nigeria.

Materials and Methods: This study was a retrospective study of cases of tuberculosis in Kuje prison between April, 2004 and December, 2008. Data was collected from their medical records. The inclusion criterion was: (1) Cases of tuberculosis in which the diagnosis was based on clinical history, smear positive test and chest x-ray radiograph. (2) Cases where the treatment of tuberculosis was according to treatment strategy recommended by World Health Organization.

Results: A total of forty-eight inmates, aged 20 to 45years, were diagnosed with tuberculosis within the period of interest. The prevalence rate was 2.4%, based on a total prison population of 2002. Majority of cases 93.8% were first detected in Prison and the remaining 6.3% were detected prior to incarceration. Out of the 6.3% diagnosed prior to incarceration, 2.1% and 4.2% of cases have defaulted from DOTS for 2weeks and more than 4weeks respectively.

Majority (66.7%) completed the treatment before discharging from prison, 29.2% were discharged from prison at various level of treatment and 4.2% of cases died while on treatment. Those who died were co-infected with HIV

Conclusion: It was evident from this study that: The prevalence of tuberculosis in Kuje prison was high, prison has a role in diagnosis and treatment, adherence and treatment outcome were good and the main indicator for mortality was HIV infection.

Primary prevention measures specifically targeting prisoners are needed to reduce prevalence of tuberculosis and also to achieve the objectives of National Health Policy on tuberculosis and leprosy.

Keywords: Prison, tuberculosis, control, mortality

INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by mainly *Mycobacterium tuberculosis* in humans[1]. Other mycobacteria such as *Mycobacterium bovis, Mycobacterium africanum, Mycobacterium canetti,* and *Mycobacterium microti* are significant cause of TB in some parts of Africa[2,3].

Tuberculosis is the most frequently occurring infectious disease in the world and also stands out as a major cause of morbidity, disability and death globally[4]. It accounts for 2-3 million deaths per annum, globally[4,5]. In 2006, a total of 1.7 million people died of TB including 231,000 people with HIV[6]. One-third of the world's current population has been infected with M. tuberculosis, and new infections occur at a rate of one per second[4-6,7]. Approximately 95% of new cases and 98% of deaths occur in developing nations. This is probably due limited resources availability and higher human immunodeficiency virus (HIV) infections[5]. The annual incidence rate is 356 per 100,000 cases in Africa[6].

In 1993, the World Health Organization (WHO) declared TB as a global emergency. This is first disease so classified in the history of that organization and the Stop TB Partnership developed a Global Plan to Stop Tuberculosis with the aim of saving 14 million lives between 2006 and 2015[8]. TB is one of the few diseases for which specific control targets have been set in the Millennium Development Goals[9]. It directly causes an annual decline in workers productivity to the tune of US$13 billion. TB is contagious and spreads through the air. If untreated, each person with active TB infects on average of 10 to 15 people every year[6]. The probability of transmission from one person to another depends upon the number of infectious droplets expelled by a carrier, the effectiveness of ventilation, the duration of exposure, and the virulence of the M. tuberculosis strain[10].

Prisoners population represent a high proportion of poorly educated and socioeconomically disadvantaged who have increased risk of ill health, including a high risk of tuberculosis infection and disease. Other conditions that increase the risk include intravenous drug abuse; overcrowding, poor nutrition, poor hygiene, and unguaranteed access to improved prison health services. The prison population has a high burden of disease may be because access to medical care is limited and the population is made of substance abusers, homeless, mentally ill, ethnic minorities, asylum seekers, immigrants, people who inject drugs using unsanitary needles, medically under-served and low-income populations[11-19].

In tuberculosis control, health workers' caliber and adequacy largely determine the program quality and efficiency, as workers consume the bulk of running costs and manage the other resources. The World Health Organization (WHO) *Global Plan to Stop TB 2006 – 2015* acknowledges that the main human resource issues affecting tuberculosis control are insufficient quality, quantity and distribution of health workers[20].

Tuberculosis is diagnosed definitively by identifying the causative organism in a clinical sample like sputum or pus. When this is not possible, a probable diagnosis may be made using imaging, commonly chest X-rays and/or a tuberculin skin test. The DOTS (Directly Observed Treatment Short-course) is now showing promising results in effectively treating all TB in the community. This is strategy of tuberculosis treatment based on clinical trials done in the 1970s by Tuberculosis Research Centre, Chennai, India, focusing on a neglected area of infectious disease control is now showing promising results in effectively treating all TB cases in the community.

There is dearth of information about TB in the Nigerian prisons and Nigeria

being said to have the world's fourth largest tuberculosis (TB) burden, with more than 460,000 estimated new cases in 2007[21].

The objective of this study was to determine the prevalence of tuberculosis, role of prison in its control and the mortality from tuberculosis among prison inmate in Kuje prison, Abuja, Nigeria.

MATERIALS AND METHODS

This was a retrospective study of cases of Tuberculosis in Kuje Prison between April 2004 and December 2008. The inclusion criteria include:

1. Cases of tuberculosis in which the diagnosis was made on clinical history, smear positive test and chest radiograph.
2. Cases of TB where treatment of tuberculosis was according to the treatment strategy recommended by World health organization (i.e DOTS).

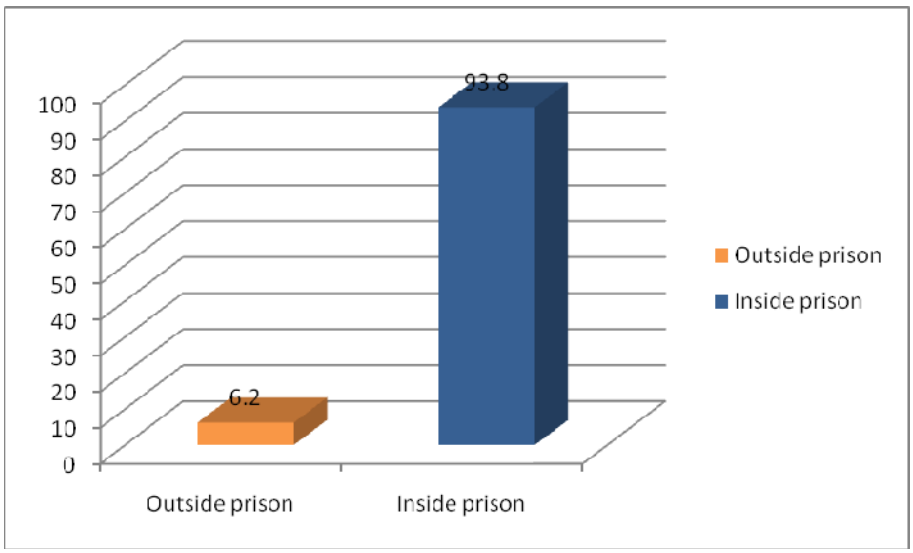
RESULTS

A total of number of inmates recorded over the study period was 2002 with awaiting trial as 1654 (82.6%) and convict as 348 (17.4%). the ratio of convict to awaiting trial inmates was 1:4.8. The population of inmates increased steadily over the study period except in 2008 when a decline was seen **(Table I)**. A total of forty-eight inmates, aged 20 to 45years, were diagnosed with tuberculosis within the period of interest. There were all awaiting trial inmates. The prevalence rate was 2.4%.

Table I: NO OF INMATES WITHIN STUDY PERIOD

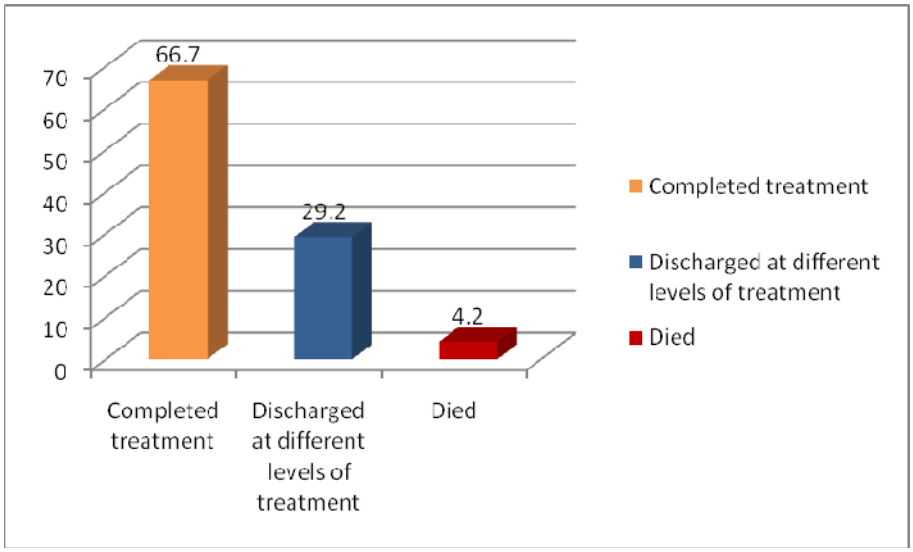
Year	Awaiting Trial (%)	Convicted (%)	Total (%)
2004	258 (15.6)	42 (12.1)	300 (15.0)
2005	215 (13.0)	65 (18.7)	280 (14.0)
2006	327 (19.8)	71 (20.4)	398 (19.9)
2007	453 (27.4)	88 (25.3)	541 (27.0)
2008	401 (24.2)	82 (23.6)	483 (24.1)
Total	**1654 (100)**	**348 (100)**	**2002(100)**

Fig. I: PLACE OF TUBERCULOSIS DIAGNOSIS



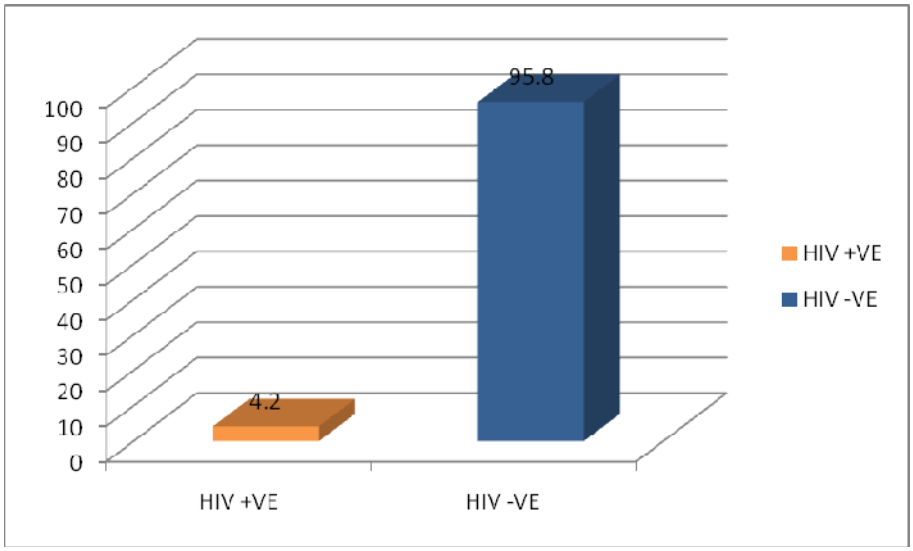
Majority of cases 93.8% were first detected in Prison and the remaining 6.3% were detected prior to incarceration **(Fig. I)**. Out of the 6.3% diagnosed prior to incarceration, 2.1% and 4.2% of cases have defaulted from DOTS for 2 weeks and more than 4 weeks respectively.

Fig. II: OUTCOME OF TREATMENT



Majority 66.7% completed the treatment before discharging from prison, 29.2% were discharged from prison at various level of treatment and 4.2% of cases died while on treatment **(Fig. II)**. Those that were co-infected with HIV died in the course of the treatment **(Fig. III)**.

Fig. III: CO-INFECTION WITH HIV



DISCUSSION

TB occurs predominantly in resource-limited countries and represents a substantial public health problem in low- and middle-income countries. The World Health Organization and the International Committee of the Red Cross have joined forces to produce guidelines for the control of tuberculosis in prisons and similar institutions in countries with a high prevalence of tuberculosis. The internationally recommended strategy for tuberculosis control relies on early detection and cure of patients, with a priority for infectious cases. Screening of prisoners on entry into prison may have a role in early case detection. This is reflected by the study as 10% in this study were already being diagnosed with tuberculosis before incarceration. Overcrowding, poor nutrition, poor hygiene and long prison sentences promote tuberculosis. These are dominant features of Nigeria prisons and this may explain why 90% of cases were first diagnosed in prison. Overcrowding, poor ventilation, poor nutrition and inadequate or inaccessible medical care can facilitate the spread of disease in the prisons.

Prisons act as a reservoir for TB, pumping the disease into the civilian community through staff, visitors and inadequately treated former inmates[22]. Therefore, improving TB control in prisons will benefit the community at large. Community TB control efforts cannot afford to ignore prison TB.

Most prisoners come from underprivileged sectors of the general population and are more likely to have contracted tuberculosis before their arrival in prison.

The prevalence of 2.4% recorded in this study is lower than 4.0% recorded in Zambian prisons[23]. All the cases of TB in this study were inmates of awaiting trial. This group poses a lot of risk as they come in contact with many people as they are moved from prisons to court rooms and when they receive visitors ranging from lawyers, human right groups and family members.

Certain features of the prison environment provide an opportunity to implement effective control programmes. For example, the captive audience in prisons should facilitate direct observation of treatment, complete coverage, and health education. In this present study, quite a

high number (64%) completed their treatment of tuberculosis while still in prison and 32% discharged at different level of treatment were adequately motivated to complete the treatment outside the prison in DOTS near their residence.

Judicial services are slow and this has been condemned in many quarters. This long stay before trial served as an opportunity to achieve complete treatment of tuberculosis in two third (66.7%) of the affected group. Long duration of antituberculosis negatively impacts on adherence to therapy. In this study, previously diagnosed inmates before incarceration defaulted. Confinements removed cases of defaulting which is a positive side of imprisonment. This substantiated the fact that a prison is a control setting for TB control[24,25].

Tuberculosis is a leading cause worldwide of morbidity and mortality among HIV-infected people[26]. In this study, the mortality rate was 4.2%. The co-infection with HIV infection was the predictor of mortality. Prison conditions, tuberculosis, and HIV transmission are interconnected. Prevalence of HIV is higher in prison than the society due Illegal drug use, Sex between men, voluntary or forced, and rare use of condoms[27,28]. The HIV epidemic complicates control of tuberculosis in prisons. This is confirmed in this study as 4.2% of cases were HIV-infected and were the only ones that died during treatment.

CONCLUSION

It was evident from the study that the prison has a role in the diagnosis and treatment of TB. Mortality was low and the main indicator was HIV infection. Adherence and treatment outcome were good. Emphasis should be placed on primary prevention to reduce the prevalence of tuberculosis in prison. It is also recommended that prisons should be well-ventilated, overcrowding should be prevented and good nutrition provided to reduce the tuberculosis prevalence to the barest minimum inorder to achieve the objectives of National health policy on tuberculosis and leprosy.

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