PREVALENCE OF HUMAN IMMUNODEFICIENCY VIRUS AMONG TUBERCULOSIS PATIENTS IN KANO, NIGERIA

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SUMMARY

Background

Tuberculosis (TB) is a major public health problem worldwide with an estimated one third of the world's population being infected by the agent *Mycobacterium tuberculosis.* The TB problem has escalated in the last two decades in the developing countries because of the recent pandemic of human immunodeficiency virus (HIV) infection. Previous studies have shown a high prevalence of HIV in TB patients. However, there is no documented study from Kano, Nigeria.

Aims

Therefore, this study is aimed at establishing current prevalence of HIV infection in TB patients attending Aminu Kano Teaching Hospital, Kano, Nigeria.

Methods

All confirmed pulmonary TB were screen for HIV. Pulmonary TB was diagnosed by microscopic examination of acid-alcohol fast bacilli stained sputum smear using the Ziel-Neelsen method. HIV was determined using Genscreen plus HIV Ag-Ab EUSA technique and confirmed by immunoconfirm technique.

Results

Among the 200 tuberculosis patients studied, 41(20.5%) were positive for antibodies to HIV. The highest prevalence rate was found in the age group 31 to 40 years (12%)

Conclusion

This study has confirmed high prevelance of HIV in patients with tuberculosis. The result shows a high HIV seroprevalence in TB patients in Kano, Nigeria. It is suggested that patients with TB should be tested for routinely for HIV.

Key-words: Human Immunodeficiency Virus, Tuberculosis, Prevalence, Kano, Nigeria

INTRODUCTION

Infection with human immunodeficiency Virus (HIV) eventually leads to Acquired immunodeficiency Syndrome (AIDS). After a person becomes infected with HIV, there is a progressive and ultimate reduction in the cell mediated system as a result of which a variety of apportunistic infections that are normally held in check by the body's defense mechanism sets in[1]. Mycobacterium is responsible for an increasing proportion of opportunistic infections associated with HIV diseases. *Mycobacterium tuberculosis* and *Mycobacterium Avium* complex (MAC) are the most common pathogens, although other species may also infect patients with advanced HIV disease, for example *Mycobacterium kansasi*[2].

According to WHO estimation at the end of 2000 about 12million people have been infected with tubercle bacilli and HIV in the world 68% of them live in Africa[3,4]. HIV infection is the highest risk factor identified which augments the reaction of latent infection with tubercle bacilli to active TB[4]. The relationship between TB and HIV infection has been documented in many countries. For example, a high prevalence rate of 46.3% was reported from the united state of Americas. It was also documented in some African countries such as Ghana (46.2%)[6] and former Zaire now democtratic republic of Congo (36%)[7]. Similar

studies carried out in Nigeria showed a prevalence rates of 6.1 % (Jos)[8], 6.8%(Lagos)[9] and 32.8%(Ibadan)[10]. However, this type of study has never been carried out in Kano. Therefore, it was conducted to determine the seroprevalence of mv infection among TB patients attending chest clinic of Aminu Kano Teaching Hospital, Kano.

MATERIALS AND METHODS

Study Population:

The study was carned out between the months of April and August, 2005 in two hundred TB patients attending chest clinic of the Aminu Kano Teaching Hospital, Kano, Nigeria. Written and informned consent was obtained from the patients who also agreed to provide blood samples for screening of HIV antibodies. Clearance from ethics committee of Aminu Kano Teaching Hospital was sought for.

Sample Collection:

Sputum - Three separate freshly voided sputa samples coughed from the base of respiratory tract were obtained from each patient; the first on the first day; the second the next morning and the third on the second day.

Blood samples - About 5ml were collected from each patients into l0ml plain tubes. Serum was separated and kept at -20°C until analyzed for mv antibodies.

Sample Analysis

The sputum samples were processed according to established procedure using the ZiehlNeelsen (ZN) method[11]. Sample was considered positive when sputum smear was positive for *Mycobacterium tuberculosis* in at least two out of the three specimen. If only one sputum specimen was positive, then three further sputa were examined and the test was considered positive when sputum smear was positive in at least one of these last specimen else the test was considered negative, in accordance with World Health Organization tuberculosis programme criteria[12]. Patients were diagnosed as having TB if they were sputum smear positive or had chest X-ray changes suggestive of TB irrespective of sputum smear status. Serum samples were analyzed for HIV antibodies using Genscreen plus HIV Ag-Ab EUSA kit (BIO-RAD). It is based on the principle of the sandwich technique for the detection of HIV antigen and of the various antibodies associated with HIV I and / or HIV 2 virus in human serum or plasma. Thrice repeatedly positive samples from each patient were considered positive after confirmation with Immunoconfinn Kit (Orgenics).

Statistical Analysis:

The data obtained was analysed using student-t test to determine differences between the means. P value <0.05 were considered significant.

RESULTS

A total of 200 subjects were recruited in the study made up of 133(66.5%) males and 67(33.5%) females, they were all sputum smear positive for *Mycobacterium tuberculosis.* In addition, 136 non TB individuals (93males and 43females) were used as controls.

Tables I shows that 41(20.5%) of patients with TB were positive for antibodies to HIV, while 159(79.5%) had no antibodies to HIV. The seroprevalence was 70.7% in males and 29.3% in females.

Table II shows the distribution of HIV infection according to age groups. The highest prevalence rates are found among the age groups 31-40years(12%) and 2130years(4.5%). The lowest rates were among those between 11-20years(0.5%) and 0
lOyears(1.5%). Age group between 51-60years, 61-70years and 71-80years were all negative for HIV antibodies. All the 136 control individuals who were apparently healthy and non TB tested negative for the HIV antibodie.

Table I. The Seroprevalance of mv according to sex

Sex	Total Number Screened	Total Number Positive
Female	67(33.5%)	12(6.0%)
Male	133(66.5%)	29(14.5%)
Total	200	41(20.5%)

Table ll. Seroprevalence of mv among both sexes by age groups

Age group (years)	Number examined	Number Positive
0-10	9 (4.5%)	3 (1.5%)
11-20	4 (2.0%)	1 (0.5%)
21-30	49 (24.5%)	9 (4.5%)
31-40	85 (42.5%)	24 (12.0%)
41-50	44 (22.0%)	4 (2.0%)
51-60	7(3.5%)	NIL (0.00%)
61-70	1 (0.5%)	NIL (0.00%)
71-80	1 (0.5%)	NIL (0.00%)
Total	200	41 (20.5%)

DISCUSSION

This study aimed at determining the prevalence of HIV infection among TB patients attending chest clinic of Aminu Kano Teaching Hospital. The main finding of this study is the high prevalence rate (20.5%) of the HIV infection in the studied group. This indicates the degree of relationship between TB and HIV infection in the studied area. We take this to mean that all patients with TB or other features that makes one suspect TB, for example, weight loss, chest pain, night sweat, etc., should be counselled and tested for HIV in addition to the examination of sputum for TB. The seroprevalence found in this study agrees with similar studies that established significant HIV prevelance (28.0%) in United Sate of America[13], in Accra, Ghana (46.2%)[6] and Ibadan, Nigeria (32.8%)[14]. The result of this study is expected as it was reported that the trend of HIV infection has been on the increase in every six months in Kano according to study conducted by Nwokedi and Kwaru[15]. Other similar studies earlier carried out shows lower prevalence, for example, in Lagos by Edieki and Nwobi[4] (6.8%)[9] and in Jos by Anteyi et al (6.1 %)[8]. It has been indicated that HIV may contribute to reactivating latent *Mycobacterium tuberculosis* infection or make person with recent infection more susceptible to rapid progression to active tuberculosis. Active TB may in turn accelerate the progression of HIV

infection to AIDS and accentuate the morbidity associated with HIV-AIDS and TB[16]. It has been documented that the incidence of TB in developing countries has continued to increase despite the efforts of control programme, the trend has been attributed to among other factors, lowered immunity due to HIV[17]. The seropositivity of HIV was more frequent in males than in females ratio[7:3]. This agrees with the report of Theuer et al13 who gave a ratio of 11:4 of HIV infection in males compared with females in United States of America but it contrast with the study carried out by Edeki and Nwobu[9] who gave a ratio of 5:2 for females and males respectively.

This may be attributable to the change in life style of females than males in this part of Nigeria where it is known that males are more involve in high risk behaviours than females. The highest seropositivity was in patients between the ages of 31 and 40 years which correlates with the findings of previous studies[9,13]. Other age groups that showed high prevalence in this study were 21-30 and 41-50. The observation of higher infection among the three age groups seen here may have been accounted for by the fact that majority of persons in these age groups are sexually active and more prone to maintenance of multiple sex partners, intravenous drug use and other high risk behaviour that make them vulnerable. Our result show a high HIV seroprevalence in TB patiens in Kano, Nigeria and suggest that TB patients or those suspected of having TB should be tested for HIV antibodies.

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