

THE PREVALENCE OF HIV-1 ANTIBODIES IN 106 TUBERCULOSIS PATIENTS

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ABSTRACT: Sera were collected from all 106 tuberculosis (TB) patients consecutively seen over a period of six months at the Armed Forces General Hospital. All were tested for the presence of HIV-I antibodies, using the ELISA (Wellcozyme) and confirmed with the Western Blot (Biorad), out of which 7 reacted positively. Six of the seven HIV-I positive patients had pulmonary tuberculosis and only one had the disseminated form as opposed to 31% of the 106 patients presenting with the latter. Five of the HIV -I positive patients had a history of sexually transmitted diseases (STD) compared to 30 of the 99 HIV-I negative patients (39.4%). The study seems to show a positive association between HIV-I infection and tuberculosis. We therefore believe that further studies should be done in this country in order to a certain the association between the two diseases.

INTRODUCTION

The acquired immunodeficiency syndrome (AIDS) has now been recognized as the most serious and pressing national, international and global health problem. It has been responsible for the loss of many lives and remains a formidable threat for many more. Its social, economic and political significance is unprecedented.

Though the epidemiology of the disease is not identical in all areas and the clinical profile may vary, the immunopathogenesis is similar in most affected patients (1). The virus causes an imbalance of the immune system and predisposes the affected individual to a range of opportunistic infections and malignancies. The susceptibility to these organisms increases with the decline in the cellular immunity which is expressed by a fall in the number of helper T - lymphocytes (2). For the most part, it is the reactivation of an infection acquired earlier as a result of a compromised defence mechanism (3). In this connection tuberculosis, both typical and atypical plays an important role both in the developed and developing world (4). Reports from parts of the United States indicate a rising incidence of tuberculosis commensurate with the AIDS epidemic (4,5). The situation in Africa appears even more serious although the full extent of the problem is yet unknown (6).

Tuberculosis is rampant in Ethiopia and HIV infection seems to be spreading at an alarming rate. However, there is no national data as yet indicating the relationship between the two diseases, if any. This study was designed to give some light in this direction.

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SUBJECTS AND METHODS

The study population consisted of all 106 tuberculosis (fB) patients seen consecutively from August 1988 to January 1989, at the Armed Forces General Hospital. Of these 104 were male and only 2 were female, with a mean age of 24.8 years (range 18-62 years). Seventy one of them were treated as outpatients and 35 were hospitalized. The demographic characteristics of these patients is show in table A standard questionnaire was used to collect the following information: name, age, sex, marital status, place of residence, income in Birr (1US=2.07Birr), history of previous hospitalization, blood transfusion, visit to prostitutes and history of other STDs etc. The diagnosis of tuberculosis was made in the usual manner, using the various combintions of clinical information, radiological findings, laboratory results, Mantoux skin tests, response to therapy and histology when indicated. Mantoux test was performed in 35 hospitalized patients using 2 tuberculin units.

Sputum was repeatedly examined for acid fast bacilli (AFB) in 51 patients while pertinent x-rays were done in all the 106. Cutaneous tuberculosis was diagnosed histologically while ascitic and cerebrospinal fluid examinations served to recognize peritoneal and meningeal lesions, respectively. TB spondylitis was basical- Iy a radiological and clinical diagnosis. Sera were collected from all of the 106 patients and screened for HIV -1 antibodies at the Armed Forces General Hospital using the enzyme-linked immunosorbant assay (Wellcozyme ELISA). Reactive sera were sent to theNational Research Institute of Health for repeat ELISA and Western blot (Biorad) confirmation. Statistical analysis were done using the Chi-square method and Yates correction.

Of the 106 sera examined 18 reacted positively by the ELISA method 7 (6.6%) of which were confirmed by the Western blot. Out of the 7 HIV-1 positive patients 6 (85.5%) had pulmonary tuberculosis and only one had the disseminated form compared to 65 (61.3%) pulmonary and 33 (31.1%) disseminated tuberculosis in the 106 patients. The demographic and clinical data of the HIV-1 antibody positives as well as the clinical pattern of 106 tuberculosis patients is shown in tables 2 and 3 respectively.

There were 3 patients with liver disease and one was positive for HBsAg. Two out of the 4 treated as inpatients expired due to con-comittent advanced chronic liver disease. The one patient with disseminated tuberculosis developed a picture of clinical AIDS manifesting with oral candidiasis, watery diarrhea of more than one month duration and weight loss in excess of 20 kilogrAIDS. All of them had a history of previous hospitalization and one had a history of blood transfusion.

Table 1. Demographic Charactentics of 106 TB Patients

Sex

Male 104

Females 2

Age 24.8 (Range 18-62)

Maritsl sttus

Single 71

Married 34

Religion
 Christian 92
 Muslim 14
 Income in Birr
 < 300 104
 > 300 2

Mantoux test performed in 4 HIV-1 positive patients was negative in all compared to 14 of 31 (45%) HIV-1 negatives. Acid fast bacilli were demonstrated in the sputums of 5 HIV-1 positive patients and 21 of 44 (47.7%) HIV -1 negatives that were adequately examined. This difference is statistically significant ($P < 0.05$).

A history of other STDs was more frequently obtained in HIV -1 positive patients (71.4%) compared to HIV-1 negatives (39.4%) ($P < 0.05$). Table 4 shows the distribution of other STDs seen in the 106 patients.

DISCUSSION

In this study we have been able to document 6.6% HIV-1 seroprevalence in 106 tuberculosis patients. Even though the two groups may not be comparable it is worth noting that HIV-1 prevalence determined at about the same time in 24, 768 blood donors is 2.3% (7).

There were 11 ELISA positive and , Western blot negative sera in this study. This pattern of discrepancy was widely seen in the various laboratories in the country. There

Table 2. Demographic and clinical data of seven patients with HiV-1 antibodies

~~ No. of n Mant~U::; ==
 No Age Sex Status STD Prostitute visit of TB Test Remark
 last 10 Yrs.
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1. 18 Male S PUI. N.D.
2. 26 Male S GC (2x) .Developed
Chancroid > 10 DiS. NEG. "AiDS"
3. 28 Male S GC > 10 PUI. N.D.
Chancroid
IGV
4. 30 Male S GC > 10 PUI. N.D.
5. 32 Male S GC > 10 PUI. NEG. Expired
6. 39 Male M GC (2x) > 10 NEG NEG. Expired
7. 62 Male M PUI. NEG.

~h~----r--
 PIII=Pulmonary; DiS=Disseminated

seems to be no good explanation for this occurrence even though the sensitivity of the ELISAreagents and some sort of cross reaction could be considered.

It is generally believed that opportunistic infections begin to appear in HIV-I infected individuals with or just before the diagnosis of clinical AIDS (2). The low prevalence of HIV -I infection among our TB patients compared to findings from elsewhere may be the result of a relatively uncompromized immune system because of a more recent introduction of the virus into the Ethiopian community .Reports from New York City in 1986 indicated that out of 58 tuberculosis patients 31 (53%) reacted positively for HIV-I antibody (5). The public health department of Dade County, Florida has also documented 22 (31%) HIV -1 seroprevalence out of 71 TB patients (8). In Zaire, 53 (33%) of 159 patients hospitalized at a tuberculosis sanitorium were HIV -1 seropositive (9). The most convincing evidence for an association between TB and HIV -I infection comes from a study involving a cohort of 519 IV drug abusers in New York City followed from 1984 through 1986. Of the 279 individuals with HIV-I infection or clinical AIDS 12 developed TB where as none of the 240 HIV-1 negatives developed the disease (10).

In our study, of the 7 HIV-I positive patients 6 had pulmonary tuberculosis. This is in agreement with the report from San Fransisco by Chaisson et al (11), but in variance with the experience of most countries where the extrapulmonary form is said to be the commonest (12).

Out of the 27 TB patients from among 45 Hatians with AIDS seen from 1980-1983 in Florida 70% (19) had extra pulmonary tuberculosis; lymph node involvement being the most common (13).

Due to the lack of reagents Mantoux test could not be performed in all patients. However, all of the 4 HIV -1 positives that were tested and 14 of the 31 HIV -1 negative patients were non-reactives. This is most probably the result of the poor nutritional status that was so conspicuous and the low level of immunity rather than HIV-I related. However, it is well known that HIV -1 infection can bring about an anergic state as the cellular immunity decreases parallel with the progression of the disease. Pitchenik et al reported an initial 40% positive Mantoux reaction in twenty patients tested (13).

The low detection rate of AFB in the sputum and other body fluids generally reflects the poor laboratory performance that commonly exists. As a result, the diagnosis is often based on clinical presentations, radiological findings and response to therapy.

It is interesting to note that 3 of our HIV -1 sero-positive patients had concomittant liver disease which is probably related to hepatitis B infection. All the three had previous hospital admissions as well. Therefore, one wonders if there is any relationship between their hospitalization and infection with HIV-I. One of the patients with liver disease is a 62 year old with positive HBsAg. Whether this antigenemia is due to the reactivation of a

previous infection with hepatitis B as a result of HIV-1 super-infection (14) or the patient has been a carrier of the antigen all along is difficult to say.

Table 3. Clinical pattern of TB in 106 patients

Clinical pattern	No. of patients	Percent
Pulmonary	65	61.3
Peritonitis	04	03.7
Cutaneous	02	01.8
Spondylitis	01	0.9
Meningitis	01	0.9
Disseminated	33	31.1
TOTAL	106	99.7

It is currently believed that other STDs act as a co-factor for HIV-1 infection by facilitating the infection process and enhancing the progression towards the development of clinical AIDS (15,16,17,18). Five of the 7 HIV-1 positive patients and 39 of the 99 HIV -1 negatives (39.4%) had a positive history for one or more sexually transmitted diseases. Four of the HIV -1 positive patients admitted to more than ten prostitute visits over the last 10 years. Whether STDs had any role in our patients is difficult to say and because of the small number it is unreasonable to make any conclusion. It is plausible that with more HIV -1 infection and the alarmingly high prevalence of STDs its contribution may soon be self evident.

Table 4. History of STD in 106 TB patients

STD	No. of patients	Percent
Gonorrhoea	24	22.6
Chancroid	10	09.4
LGV	9	08.5
Syphilis	1	0.9
None	62	58.5
Total	106	99.9

CONCLUSION

Even though the study does not show a high prevalence rate of HIV -1 infection among our TB patients it seems to indicate an association between the two diseases. Based on this study and data from elsewhere we think that a careful look for the possible co-existence of the two diseases is warranted in order to give the best possible care to patients.

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