

staff that take on that responsibility is usually the HSA. HSAs have been recruited and trained to become microscopists for malaria or TB at health centres, or they have been trained as 'cold chain' technicians for maintenance of immunisation equipment. Recently, HSAs have been appointed to manage the community based essential drug supply for the Bakili Muluzi Health Initiative (BMHI). What do you feel about this, being one of the 'old' members of the group?

JM: I think that there are advantages and disadvantages to this. As a 'cold chain' technician for example, I feel I have learnt a new skill which could be helpful to me in future, even after my retirement. However, as a technician now, I no longer work as an HSA and I am no longer eligible for refresher training in my job as an HSA. Should need arise for me to revert to my old job, I would not be as competent as my colleagues who have been exposed to further training opportunities.

GM: Your work in the community must entail a lot of travelling. How do you manage?

JM: We use bicycles which are provided by the ministry. Currently in Blantyre district there is a loan scheme for us to acquire our own bicycles. However, there are some very remote hilly areas where one cannot cycle and in that case all one does is to walk.

GM: You have given me a very clear picture of your work. Do you think this is a kind of job that girls can do as well as men?

JM: Yes, there are female HSAs, some of whom perform their duties admirably and often better than men. But for others, the very rural setting that the job requires is more than they can take for any prolonged period of time.

GM: You told me that your basic education is primary school and that there are plans to upgrade intake qualifications to 'O' levels, what impact do you think that will have the performance of workers?

JM: Well, while I think that it is a good idea to upgrade the intake, my only fear is that given the nature of the work and facilities available, some of the more highly qualified staff may not perform up to standard because their expectations may be too high. It is already evident that our newer better qualified colleagues are frustrated because they thought that they would be operating from offices or riding motor bikes and not bicycles or walking long distances in the course of their work. But I suppose it all remains to be seen!

GM: Thank you Mr Mwangata for a very illuminating interview!!

TB-HIV seroprevalence in patients with tuberculosis in Malawi

J H Kwanjana, A D Harries, F Gausi, DS Nyangulu
FM Salaniponi

SUMMARY

A country-wide survey was carried out in July 2000 of the HIV-seroprevalence in new patients with TB to compare results with HIV-seroprevalence rates in women attending antenatal clinics in similar areas of the country. All new patients with TB aged 15 years and above were consecutively registered in 13 hospitals in Malawi for a period of 10 days or until the required proportional sample size had been reached and offered HIV-testing. 482 new TB patients, 236 men and 246 women, whose mean age was 35 years were tested. 369 (77%) TB patients were HIV-seropositive compared with 1662 (24%) of 6885 women attending antenatal clinics in similar health facilities in 1999. In 2 hospitals (Ntcheu and Chiradzulu) HIV-seroprevalence rates in TB patients exceeded 90%, and in the 2 large urban hospitals in Lilongwe and Blantyre HIV-seroprevalence rates exceeded 80%. HIV-seroprevalence did not differ between men and women. The highest rate was found in patients aged 25 - 34 years with infection rates decreasing in relation to older age. Patients with smear-negative PTB had a significantly higher HIV-seroprevalence rate than patients with smear-positive PTB (OR 3.1, [95% CI 1.8 - 5.4]). In all TB patients, there was a trend for HIV-seroprevalence to increase with education status ($p < 0.01$). Patients who were widowed had a higher HIV-seroprevalence rate than those who were married (OR 2.96, [95% CI 1.07 - 8.8]). Over three quarters of TB patients in Malawi were HIV-positive, and this has important implications for TB control efforts in the country.

INTRODUCTION.

After the first cases of AIDS were diagnosed in Malawi in the mid-1980s, HIV-seroprevalence rates have gradually increased in patients diagnosed and registered with tuberculosis (TB). Studies conducted in TB patients at different individual sites in the country have shown a rising rate from 26% in 1986, to 52% in 1988, to 67% in 1993 and 75% in 1993. A country-wide study in 1993 of 358 TB patients from 16 hospitals showed an HIV-seroprevalence rate of 63% (Franco et al, unpublished observations). During the last 7 years, a number of observations have suggested that HIV-seroprevalence rates in TB patients have increased further. Programme data collected at national level show that large numbers of patients are being registered

TABLE 1: HIV-SEROPREVALENCE IN TB PATIENTS AND IN WOMEN ATTENDING ANTENATAL CLINICS FOR EACH HOSPITAL.

	Patients with TB			Women attending antenatal clinics		
	n	No.	(%) HIV+ve	n	No.	(%) HIV+ve
Northern Region:						
Nkhata Bay	21	16	(76%)	476	103	(22%)
St. Johns (Mzuzu)	15	10	(67%)	610	142	(23%)
Rumphi	25	16	(64%)	477	106	(22%)
Central Region:						
Ntcheu	26	24	(92%)	503	166	(33%)
Lilongwe	83	68	(82%)	610	154	(25%)
Mchinji	20	15	(75%)	500	133	(27%)
Nkhotakota	19	10	(53%)	448	102	(23%)
South Region:						
Chiradzulu	24	22	(92%)	-		
Blantyre	113	93	(82%)	681	190	(28%)
Mulanje	40	30	(75%)	510	181	(35%)
Mangochi	41	30	(73%)	499	136	(27%)
Nsanje	40	29	(73%)	427	111	(26%)
Mwanza	15	6	(40%)	-		

TABLE 2: HIV-SEROPREVALENCE IN RELATION TO SEX, AGE, TYPE OF TB, EDUCATION AND MARITAL STATUS.

Category	Number	No.	(%)HIV-positive
Sex:			
Male	236	174	(74%)
Female	246	195	(79%)
Age in yrs:			
15 - 24	84	59	(70%)
25 - 34	174	151	(87%)
35 - 44	123	101	(82%)
45 - 54	63	43	(68%)
55 and over	38	15	(39%)
Type of TB:			
Smear-positive PTB	203	137	(67%)
Extrapulmonary TB	100	77	(77%)
Smear-negative PTB	179	155	(87%)
Education:			
No school attendance	89	52	(58%)
Primary school	257	202	(79%)
Secondary school	131	110	(84%)
University	5	5	(100%)
Marital status:			
Married	300	219	(73%)
Single	71	55	(77%)
Divorced	66	55	(83%)
Widowed	45	40	(89%)

with smear-negative pulmonary TB (PTB). The case fatality rate in new patients with smear-positive PTB has increased from 16% in 1994 to 22% in 1998 (source = National TB Control Programme [NTP]). Operational research has shown that a significant number of TB patients develop recurrent disease after completion of treatments. Smear-negative PTB, case fatality and recurrent disease are all strongly linked to HIV infection. We decided therefore on another country-wide survey of HIV-seroprevalence in new patients being registered with TB, and compared results with HIV-seroprevalence rates in women attending antenatal clinics in similar areas of the country.

METHODS.

Setting. HIV sentinel surveillance has been carried out regularly in Malawi for several years. In 1999, consecutive women attending antenatal clinic services in 11 hospitals and 8 health centres underwent anonymous testing for HIV. HIV-seroprevalence rates for 1999 were published by the National AIDS Control Programme 7. The same 11 hospitals plus two additional hospitals were chosen for the HIV-seroprevalence study in TB patients. It was hoped that these 13 sites would provide a representative sample from the country. The HIV-seroprevalence study in TB patients was carried out in July 2000.

Patients and HIV-testing procedure. The sample size, calculated on the basis of the total number of TB cases registered in Malawi in 1998 (22,674) with an estimated 70% HIV-seroprevalence rate [95% confidence intervals of 65 - 75%], was 318 patients. Using proportional representation and rounding off numbers in each hospital to convenient sizes, the total sample to be tested was calculated as 400 patients.

All new patients with TB aged 15 years and above who were consecutively registered in the 13 hospitals for a total of 10 working days were offered HIV-testing. If the sample size number for a particular hospital was not reached

within 10 days, the study continued until it was achieved. Children aged 14 years and below, patients with recurrent TB and or transferring in from other districts were excluded from the study. For all eligible patients, a questionnaire was completed and the hospital TB officer explained that the NTP would like to take a blood sample for a country-wide HIV-seroprevalence study. HIV-results would not be linked to the name of the patient and would remain anonymous. The patient would not be able to find out the HIV-test results, which would be kept confidential by the NTP. Each patient had the right to refuse blood testing.

For patients agreeing to participate in the study, 5 ml of blood was taken and serum was stored at -20°C . All patients had blood taken within 3 days of registration, 89% having blood taken on the day of registration. Once each hospital had

collected the necessary specimens, the samples (stored in dry ice) and the completed questionnaires were sent to the Community Health Science Unit Laboratories for ELISA testing. This was carried out using Virinostika HIV-1, HIV-2 and HIV-0 test kits. In accordance with guidelines from the World Health Organization on HIV-surveillance testing⁸, only one ELISA test was carried out and the result was considered valid. Quality control checks were carried out in the laboratory.

Data Analysis. Data was entered by the central unit of the NTP into EPI-INFO, version 6.0. X2 test was used to assess differences in proportions, with differences at the 5% level regarded as significant. Crude Odds ratios (OR) with 95% confidence intervals were calculated where appropriate.

RESULTS.

During the period of study, there were 551 patients registered for TB in the 13 hospitals. 28 were children and 17 had recurrent TB. Of 506 new patients with TB, 19 refused to participate, one patient died the day after registration and in 4 patients the blood sample went missing. Of 482 patients tested, 236 were men and 246 were women, with a mean age of 35 years. There were 61 (13%) patients from the Northern Region, 148 (30%) from the Central Region and 273 (57%) from the Southern Region. 203 (42%) patients had smear-positive pulmonary TB (PTB), 179 (37%) smear-negative PTB and 100 (21%) extrapulmonary TB.

Three hundred and sixty nine (77%) TB patients were HIV-seropositive compared with 1662 (24%) of 6885 women attending ante-natal clinics. HIV-seroprevalence in TB patients and in women attending antenatal clinics for each hospital and district is shown in TABLE 1. In two hospitals (Ntcheu and Chiradzulu) HIV-seroprevalence rates in TB patients exceeded 90%, and in the two large urban hospitals in Lilongwe and Blantyre HIV-seroprevalence rates exceeded 80%.

HIV-seroprevalence rates in relation to sex, age, type of TB, education status and marital status are shown in TABLE 2. Men and women did not differ in HIV-seroprevalence. The highest HIV-seroprevalence was found in patients aged 25 - 34 years with rates decreasing progressively at older ages. Patients with smear-negative PTB had a significantly higher HIV-seroprevalence rate than patients with smear-positive PTB (OR 3.1, [95% CI 1.8 - 5.4]). In all TB patients, there was a trend for HIV-seroprevalence to increase with education status (X2 test for trend = 9.5, $p < 0.01$). Patients who were widowed had a higher HIV-seroprevalence rate than those who were married (OR 2.96, [95% CI 1.07 - 8.8]).

DISCUSSION.

The HIV-seroprevalence rate in TB patients in 13 selected sites in Malawi has risen from 63% in 1993 to 77% in 2000. There were district variations in 2000 with high rates of HIV-infection

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in TB patients in Lilongwe, Blantyre, Chiradzulu and Ntcheu. The high HIV-infection rate in Ntcheu might be because this town is on the main trunk road between Lilongwe and Blantyre, and is a popular stopping-off point for truck drivers. High HIV-infection rates were found in patients aged 25 - 34 years, in patients with smear-negative pulmonary tuberculosis, in those with higher education status and in those who were widowed. These findings are in agreement with studies carried out elsewhere in sub-Saharan Africa⁶. Although only a sample of TB patients were tested, we feel that the findings are representative for nationally registered TB patients in Malawi. Over 95% of new patients in our sample agreed to HIV testing. In the first and third quarters of each year, data is collected by the Malawi NTP from all regions to determine progress against certain targets. In the first and third quarters of 2000, a total of 11,791 new TB patients were registered nationally. Of these, 1131 (10%) were from the Northern Region, 3794 (32%) were from the Central region and 6866 (58%) were from the South. This regional distribution of patients matches the regional distribution of our study sample.

The strong link between HIV and TB in Malawi has several implications for TB control. The general public has increasingly begun to associate TB with AIDS, and our observations shows that this perception is correct. Sensitive and positive ways of dealing with this association must be found. Not all patients in Malawi with TB have HIV-infection, and the community needs to be made aware of this fact through a well conducted IEC campaign. Early identification of TB cases is important, not only to reduce TB transmission in the community but to improve the chances of a good outcome with anti-TB treatment. The NTP needs to ensure that HIV-care issues, such as offering good quality HIV-counselling and testing (VCT) or screening and treating patients for common HIV-related diseases, are not ignored and are incorporated into the diagnosis and management of TB. The

lessons being learnt through the PROTEST project in Lilongwe, which focuses on increased utilisation of VCT, a package of preventive and clinical services for HIV-positive people, screening for sexually transmitted infections and better access to community-based care, need to be taken up by the NTP.

The high case fatality rate seen in patients with smear-positive PTB, and the even higher fatality rate seen in patients with smear-negative PTB^{9,10}, are most probably the result of concurrent HIV infection. Interventions to reduce this HIV-associated death rate need to be found and assessed, either through operational research or through properly conducted clinical trials. Examples of operational research in this field are the studies being carried out in Thyolo, Karonga and Lilongwe on the use of cotrimoxazole prophylaxis to reduce death rates in HIV-positive patients who are registered with TB.

The NTP will also need to consider whether it should be trying to prevent the development of TB in HIV-positive persons and prevent recurrent disease in those who have had TB and have completed treatment. A large number of studies carried out in the last 10 years have shown that preventive treatment with isoniazid for 6 - 12 months provides significant protection against TB in HIV-positive adults, at least in the short to medium term¹¹. Furthermore, in HIV-positive patient with TB who have completed treatment, secondary isoniazid preventive therapy significantly reduces the incidence of recurrence of recurrent TB. TB can no longer be considered in isolation from HIV, and failure to address these important HIV-TB issues will mean a failure to control TB in this country.

National Tuberculosis Control Programme,
Ministry of Health, PO Box 30377, Capital City,
Lilongwe 3, Malawi
Professor A D Harries, British High Commission
PO Box 30042, Lilongwe 3, Malawi
Fax: (265) 772 657
email: adharries@malawi.net

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