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Voluntary counselling, HIV testing and sexual behaviour among patients with tuberculosis in a rural district of Malawi

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SUMMARY

OBJECTIVES: A study was conducted in new patients registered with tuberculosis (TB) in a rural district of Malawi in order to 1) verify the acceptability of voluntary counselling and testing for human immunodeficiency virus (HIV) infection; 2) describe sexual behaviour and condom use; and 3) identify socio-demographic and behavioural risk factors associated with 'no condom use'.

DESIGN: Cross-sectional study.

METHODS: Consecutive patients diagnosed with TB between January and December 2000 were offered voluntary counselling and HIV testing (VCT) and were subsequently interviewed.

RESULTS: There were 1049 new TB patients enrolled in the study. Of these, 1007 (96%) were pre-test counselled, 955 (91%) underwent HIV testing and 912 (87%) were post-test counselled; 43 (4%) patients refused HIV testing. The overall HIV infection rate was 77%. Of all HIV-positive TB patients, 691 (94%) were put on cotrimoxazole. There were 479 (49%) TB patients who reported sexual encounters, of whom only 6% always used condoms. Unprotected sex was associated with having TB symptoms for over 1 month, having had less than 8 years of school education, being single, divorced or widowed or having sex with the same partner.

CONCLUSIONS: Offering VCT to TB patients in this setting has a high acceptance rate and provides an opportunity to strengthen and integrate TB and HIV programmes.

KEY WORDS: counselling; condom; tuberculosis; HIV; Malawi

IN MOST COUNTRIES in sub-Saharan Africa where human immunodeficiency virus (HIV) prevalence is high, HIV has been fuelling the tuberculosis (TB) epidemic.[1–3] Efforts to tackle tuberculosis (TB) in such contexts have mainly focused on identifying and curing infectious TB cases among patients presenting to the general health services. In order to effectively control TB, it is necessary not only to intensify case-finding and decrease diagnostic and treatment delays, but also to implement additional measures to prevent HIV. Preventing HIV transmission in general should contribute to reducing the overall TB burden, and this should now be a high priority for TB control.

Malawi, a small country in central-southern Africa, has been experiencing a severe HIV epidemic since the 1980s, linked to which is a secondary epidemic of TB. In 2000, a country-wide survey found that 77% of new patients registered with TB were HIV-seropositive.[4] TB may be an early opportunistic infection that brings HIV-infected individuals to medical attention. It is thus an opportunity for introducing interventions linked to prevention and care.

Since early 1999, as part of an integrated HIV/TB strategy, all TB patients in Thyolo, a rural district in southern Malawi, have been offered voluntary HIV counselling and testing (VCT) as a way to promote behaviour change and safer sexual practices.[5,6] It might also provide an opportunity to reduce HIV transmission to sexual contacts who remain HIV-negative. VCT particularly serves as an entry point for offering adjunctive cotrimoxazole for the prevention of opportunistic infections in HIV-infected TB patients.[7,8]

Good counselling requires full discussion and understanding of sexual behaviour and condom use, the latter being a critical measure in preventing the sexual transmission of HIV.[9] This would be relevant in targeting preventive counselling as well as for guiding condom promotion strategies within the general population.

The present study was carried out among patients presenting with TB in order to 1) verify the acceptability of voluntary counselling and HIV testing; 2) describe sexual behaviour and condom use; and 3) identify socio-demographic and behavioural risk factors associated with 'no condom use'.

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MATERIAL AND METHODS

Study setting, diagnosis and treatment of TB patients

This study was conducted during a 1-year period among all new TB patients registered between January and December 2000, under routine programme conditions, in Thyolo district in rural southern Malawi. The district has 450 000 inhabitants. Two hospitals manage TB in the district, and both were involved in the study. In these two hospitals, TB patients are diagnosed, registered and started on standardised anti-tuberculosis treatment according to national guidelines.[10] Patients who are sputum smear-positive for acid-fast bacilli (AFB) are classified as smear-positive pulmonary tuberculosis (PTB). In patients who are sputum smear-negative, a diagnosis of smear-negative PTB is made for those with radiographic abnormalities consistent with TB. The diagnosis of extra-pulmonary TB (EPTB) is usually made on the basis of clinical features, radiographic appearances and laboratory-based examination of serous fluid.

Those with smear-positive PTB and serious forms of EPTB were given an 8-month regimen consisting of 2 months of daily supervised streptomycin (S), rifampicin (R), isoniazid (H) and pyrazinamide (Z) in hospital followed by 6 months of daily unsupervised H and ethambutol (E) in the community (2SRHZ/6HE). New patients with smear-negative PTB and less serious forms of EPTB were given a 12-month regimen consisting of 1 month of daily supervised SHE in hospital followed by 11 months of daily self-administered HE (1SHE/11HE). The initial phase of treatment was always administered in hospital, and the continuation phase in the community.

Integrated VCT, cotrimoxazole prophylaxis and referral to home-based care

All patients, once registered and started on standardised anti-tuberculosis treatment, are referred to the hospital's HIV VCT unit, where pre-test counselling is given. This involves giving basic information about HIV and the acquired immune-deficiency syndrome (AIDS) and its prevention, explaining the reasons for recommending the HIV test and the patient's right to refuse the test. Patients who accepted HIV testing were also offered post-test counselling. If the test was negative for HIV, the patient was given information on how to avoid contracting HIV and AIDS (primary preventive counselling). If the test was positive, the patient received information on how to prevent re-infection and transmission to partner(s), and on condom use (secondary preventive counselling). Partner counselling was encouraged, and patients had access to same day test results. All blood samples were screened for HIV-1 and HIV-2 using a combination of two rapid tests, the Capillus (Cambridge Diagnostics Ltd, Galway, Ireland) and HIV-Spot (Genelabs Diagnostics, Singapore) tests. All tests were performed according to the manufacturers' instructions. The choice of tests conformed with the World Health Organization (WHO) strategy II for HIV antibody testing.[11] Any discordant sample was retested, and if it remained discordant was sent for enzyme-linked immunosorbent assay (ELISA) testing at the referral hospital in Blantyre.

Patients who tested HIV-seropositive were also offered adjunctive cotrimoxazole at the time of post-test counselling, provided there were no contraindications to the medication. Cotrimoxazole was given at a dose of 480 mg (400 mg sulphamethoxazole and 80 mg trimethoprim) twice daily for the whole course of anti-tuberculosis treatment, and indefinitely thereafter. Anti-tuberculosis drugs and both daily doses of cotrimoxazole were administered by direct observation during the initial phase of treatment. In the continuation phase, anti-tuberculosis drugs and cotrimoxazole were collected by patients at monthly intervals from their nearest health facility, and the drugs were self-administered. After anti-tuberculosis treatment, patients were encouraged to continue with cotrimoxazole prophylaxis, which is provided free of charge at the health centres.

At the end of the initial phase, all patients once again visit the counselling unit for reinforcing counselling messages. The counselling unit also refers all TB patients to a trained network of community-based volunteers who manage basic opportunistic infections (for those patients who are HIV-positive) and provide social support for all those who might require it. Trained volunteers are provided with a home-based care (HBC) kit containing basic drugs for opportunistic infection management, and supportive material for care. The community network also has an active association of people living with AIDSs (PLWA) who are involved with community mobilisation and awareness. The network also offers orphan care, vocational training, income generation activities and nutritional support for individuals within HIV/TB-affected households.

Anti-retroviral treatment is currently not available for HIV-infected TB patients in Malawi.

Data collection and statistical analysis

Counselling unit registers were used for gathering information on the counselling process, HIV status and cotrimoxazole uptake. The TB register was used to gather information on TB type, while a semi-structured, pre-tested questionnaire was used to gather information on basic socio-demographic data, duration of TB symptoms, sexual behaviour and previous medication. All TB patients were interviewed after obtaining informed consent. Interviews were conducted in the local language in the counselling unit by the HIV counsellors, and the same team was used throughout the course of the study.

The TB symptomatic period (rather than a fixed calendar time period) was used to gather information on sexual behaviour. Symptoms included cough, difficulty in breathing, chest pain, weight loss, night sweats or lymph gland enlargement.

'Same partner' was defined as 'spouse' or a steady sexual partner over a period of at least 6 months prior to the interview.

Analysis was done using Epi-Info (Centre for Disease Control and Prevention, Atlanta, GA) and Logistic software.[12] The measures of risk were determined by crude and adjusted odds ratios (OR). ORs were adjusted using multivariate logistic regression, and all related *P* values are based on the likelihood ratio statistic. 'No condom use' during sexual encounters was designated as the dependent variable for identifying potential risk associations. This group of people who never use condoms (as against those who use condoms intermittently) were selected a priori, as they are more likely to represent complete operational gaps or barriers in condom promotion, accessibility or acceptability in the district.

The level of significance was set at $P = 0.05$ or less and 95% confidence intervals (CI) were used through out.

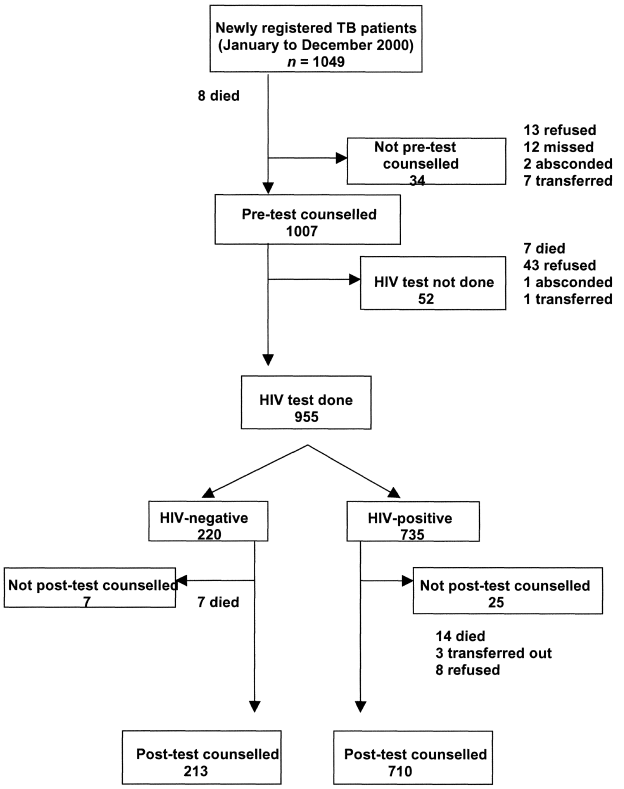

Figure Voluntary counselling and HIV testing in TB patients.

RESULTS

Characteristics of the study population

There were 1049 new TB patients who were registered during the study period. This included 483 (46%) patients with smear-positive PTB, 336 (32%) with smear-negative PTB and 231 (22%) with EPTB. Of these, 64 patients were excluded from the questionnaire part of the study: 34 patients did not want to participate in the interview, four died before interviews could be conducted, and 26 questionnaires were incomplete. Of the 985 patients whose data were complete, there were 503 men and 482 women (49%), with a median age of 32 years (range 11–82) and a median educational level of 6 years (range 0–13) in school. There were 248 patients who were married, while 737 (75%) were either unmarried, divorced or widowed. The commonest occupations were farming in 526 (53%), unskilled work in 189 (19%), skilled work in 105 (11%) and business in 136 (3%) patients. The majority of patients (94%) resided in villages, with 62% earning less than 4 USD per week. The median period spent with TB symptoms prior to diagnosis was 56 days (range 9–365). Nine hundred and sixty-five (98%) patients had received medication from either a traditional healer or from the private health sector before commencing antituberculosis treatment.

Voluntary counselling and HIV testing

Of the 1049 new TB patients, 1007 (96%) were pretest counselled, 955 (91%) underwent HIV testing and 912 (87%) were post-test counselled. Thirteen (1%) patients refused pre-test counselling, 43 (4%) refused HIV testing, and eight refused to know their HIV results after accepting to be tested for HIV (Figure).

Of the 955 TB patients who were HIV tested, 735 (77%) were HIV-positive: this included 294 (67%) of 439 smear-positive PTB patients, 252 (85%) of 296 smear-negative PTB patients and 189 (86%) of 220 EPTB patients. The mean period between registration for TB and post-test counselling was 3 days. Of all partners of HIV-infected TB patients, 60% accepted VCT and a family relative was involved (along with the patient) in 89% of post-test counselling sessions. Of those who were post-test counselled, 691 (97%), 94% of all HIV-positive TB patients, were eventually placed on cotrimoxazole following VCT.

Sexual behaviour and risk factors associated with 'no condom use'

Of all TB patients, 479 (49%) reported having had sex during the period of TB symptoms, of whom 356 (74%) were HIV-seropositive. Table 1 shows sexual behaviour and condom use in relation to HIV status. Of the 31 (13%) patients who had never heard of condoms, 90% resided in villages; 87% of those who used condoms intermittently were HIV-positive compared to 73% of those who never used condoms (OR 2.5, 95%CI 1.5–4.2, $P < 0.001$).

Significant risk factors associated with 'no condom

Table 1 Sexual behaviour and condom use in relation to human immunodeficiency virus (HIV) status in patients with TB

Variable	HIV+ *n* (%)	HIV− *N*	Total *n* (%)
Total	727 (78)	208	935*
Sex during TB symptomatic period = yes	356 (79)	96	452
With same partner	208 (74)	73	281 (62)
With different partners	148 (87)	23	171 (38)
Condom use during sex (n = 452)			
Always	20 (71)	8	28 (6)
Intermittent/sometimes	171 (87)	26	197 (44)
No condom use	165 (73)	62	227 (50)
Reasons for 'no condom use' (n = 227)			
Sex with the same partner	104 (72)	41	145 (64)
Refusal by partner	9 (60)	6	15 (7)
Condom not available	11 (73)	4	15 (7)
Reduces pleasure	14 (82)	3	17 (8)
Religious reasons	3 (75)	1	4 (2)
Did not know about condoms	24 (77)	7	31 (14)

* HIV status was unknown for 50 TB patients.

use' in TB patients include being single/divorced or widowed, having had less than 8 years of school education, having had TB symptoms for over 1 month and having sexual encounters with the same partner (Table 2).

DISCUSSION

This study shows that in a rural district of Malawi there is a high acceptance rate for VCT and cotrimoxazole prophylaxis among TB patients, of whom

Table 2 Risk factors associated with 'no condom use' in TB patients reporting sex (n = 479)

Variables	Condom = No (%)	OR	Adjusted OR* (95%CI)	*P* value
Sex				
Men	126/266 (47)	1	1	
Women	111/213 (52)	1.2	0.8 (0.5–1.2)	0.26
Age				
>20 years	222/452 (49)	1	1	
<20 years	15/27 (56)	1.3	2.0 (0.8–5.4)	0.15
Marital status				
Married	29/115 (25)	1	1	
Single/divorced/widowed	208/364 (57)	4.0	3.1 (1.8–5.3)	<0.001
Residence				
Semi-urban towns	31/97 (32)	1	1	
Villages	206/381 (54)	2.5	1.3 (0.7–2.4)	0.32
Education				
>8 years	35/128 (27)	1	1	
<8 years	202/351 (58)	3.6	2.1 (1.3–3.7)	<0.01
Occupation				
Non farmers	101/242 (42)	1	1	
Farmers	136/237 (57)	1.9	(0.6–1.8)	0.94
Income				
>4 USD/week	90/226 (40)	1	1	
<4 USD/week	147/253 (58)	2.1	1.3 (0.8–2.1)	0.27
Period of TB symptoms				
<1 month	75/215 (35)	1	1	
>1 month	162/264 (61)	3.0	2.1 (1.3–3.2)	<0.01
TB type				
Smear negative TB/EPTB	125/271 (46)	1	1	
Smear positive TB	112/208 (54)	1.4	1.3 (0.9–2.0)	0.22
Partners				
Different partner	47/182 (26)	1	1	
Same partner	190/297 (64)	5.1	5.3 (3.4–8.3)	<0.001

* Adjusted for sex, age, marital status, residence, education, occupation, income, period of symptoms, TB type and partners.
OR = odds ratio; CI = confidence interval.

approximately three-quarters are HIV-seropositive. Of the TB patients who had sexual intercourse, 50% had never used condoms. 'No condom use' was more common in those with a long duration of TB symptoms, a short period of school education, being single/divorced or widowed and having sex with the same partner.

Studies in Africa have shown the efficacy of VCT in promoting behaviour change and safer sexual practices, and it appears to be a cost-effective intervention to reduce the sexual transmission of HIV.[5,6] Our experience with VCT among TB patients in the rural programme setting is very encouraging, for a number of reasons. First, it has been possible to integrate VCT services within the framework of routine TB control, and the acceptance rate for VCT is high, with only 1% of all TB patients refusing pre-test counselling and 4% refusing HIV testing. Successful integration of VCT services within a national TB programme has also been reported in Côte d'Ivoire.[13] Second, it has offered us the opportunity to introduce systematic HIV-preventive counselling for all TB patients and to offer cotrimoxazole prophylaxis for those found to be HIV-positive.[7] The uptake of cotrimoxazole has also been high, with 94% of all HIV-positive TB patients being placed on prophylaxis. High compliance with cotrimoxazole prophylaxis 4 to 6 months after starting anti-tuberculosis treatment has been demonstrated previously in our setting.[14] Third, good links have been established between hospital counselling services and community care groups. This has made it possible to refer HIV-infected individuals to the community for continuing social and nutritional support, home-based care and the management of basic opportunistic infections. Anti-retroviral treatment is currently not available for HIV-infected TB patients in Malawi. However, such a network that offers a package of basic care, chemoprophylaxis and support is a step towards provision of comprehensive HIV care, including the possible introduction of anti-retroviral therapy into the system.

The high uptake of VCT in our setting might be due to a number of reasons. First, VCT is fully integrated into the TB circuit and offered to all TB patients systematically, thereby reducing the possibility of stigma for any particular patient. Second, the VCT unit is well staffed with trained counsellors, has adequate space to ensure privacy and offers rapid HIV testing. This enhanced privacy and averted undue delays. Third, VCT serves as the entry point to accessing cotrimoxazole prophylaxis as well as referral to the network of community volunteers who provide continuing care and social support. In a resource-poor setting, where effective and affordable interventions to reduce morbidity and mortality in HIV-positive individuals are limited, it is likely that access to cotrimoxazole as well as a network of community volunteers who provide care and social support would act as incentives for VCT.

The high uptake of cotrimoxazole prophylaxis in our setting might also be related to the quality of VCT services and the eventual value of the drug as perceived by the patient. In our setting we also use the CARE model approach in counselling.[15] This requires that the spouse, a close relative or 'significant other' is involved in the counselling process. This enhances understanding and support for the patient at home, and limits the problems associated with disclosure and loss of confidentiality when taking pills on a daily basis.

The main obstacle to setting up VCT and cotrimoxazole prophylaxis in our setting was the lack of human and financial resources. This was overcome by increasing the capacity and numbers of available human resources, and providing the additional funds required for training, supervision and the purchase of rapid tests and cotrimoxazole. The additional resources were provided by the supporting non-governmental organisation, Médecins sans Frontières.

In gathering information on sexual behaviour, we used the period of TB symptoms rather than a fixed calendar time period, firstly because the longer the period of TB symptoms prior to presentation to hospital VCT services (and hence to primary and secondary HIV preventive counselling), the greater is the potential for high risk sexual behaviour and therefore for acquiring or transmitting HIV to partners who might be uninfected. Knowledge about sexual behaviour during the TB symptomatic period would therefore reinforce the relative importance of encouraging early presentation to hospital and VCT services. Secondly, we did not intend to collect specific information on the frequency of sexual episodes and number of sexual partners (in which case a standard time period would be necessary), but rather general information on sexual behaviour as related to type of partner(s) and condom use. One of the limitations of our approach is that the TB symptomatic period will vary to a certain extent between individuals, and might, as a result of the variable period of sexual risk, introduce differential recall bias.

In our study, patients spent a median period of 56 days (2 months) with TB-related symptoms before presenting at the hospital. Those who had symptoms for long periods and were HIV-positive were also at higher risk of not using condom during sexual encounters. Community awareness campaigns and closer collaboration with alternative care providers are required in order to bring patients into early contact with VCT services (which offer primary and secondary HIV preventive counselling) and to institute early and effective anti-tuberculosis treatment. Reducing treatment delays will also have an effect on reducing the overall risk of TB transmission to people living with HIV in the community.[1–3]

A high proportion (51%) of the TB patients in our study were not sexually active. It is possible that TB

patients might simply be weak as a result of the illness and are hence sexually inactive. Perceptions of sex while having TB might also be important. Another study in Malawi showed that 58% of TB patients country-wide believed that it was necessary to abstain from sexual intercourse during TB treatment.[16]

HIV prevalence in those who used condoms intermittently was significantly higher than in those who did not use them at all. The majority of those who reported 'no condom use' had sex with the same partner and are likely to have a smaller sexual network than those who report intermittent condom use. The latter group might have a larger sexual network and may use condoms as they perceive themselves at risk, but yet are unable to always negotiate condom use.

The great majority of our TB patients reside in villages and have had less than 6 years of school education. Information, education and communication (IEC) strategies on safer sexual behaviour in Malawi have often concentrated on urban areas and the use of written media (boards, posters, etc), which are not adapted for less literate rural populations. There is now an urgent need for socio-culturally adapted, intensive and sustained educational campaigns that can bridge knowledge gaps and promote safer sex among rural populations.

One of the general limitations of the study is that the information on sexual behaviour and condom use is self-reported, and that too in TB patients that are predominantly sick with TB and already HIV-infected. We tried to minimise this by ensuring that the interviews were conducted by well-trained and experienced HIV counsellors who were conversant with the approach on sexual issues within the particular population. Interviews were readily rescheduled by the interviewers if the patient felt uneasy or appeared unready for whatever reason to respond to the requested information at any particular time.

This study demonstrates high clinical coverage with VCT and cotrimoxazole among TB patients who are a high-risk group for HIV. Offering VCT to TB patients who are predominantly HIV-positive provides an excellent opportunity for strengthening and integrating HIV and TB control activities as well as for introducing interventions for prevention and care. What is now needed is the political and social will as well as the resources to make VCT available to the vast numbers of people with little or no access to it.

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RÉSUMÉ

OBJECTIF : Cette étude a été menée chez des nouveaux patients enregistrés comme tuberculeux (TB) dans un district rural du Malawi, afin : 1) de vérifier l'acceptabilité de l'accompagnement volontaire et du test pour le virus de l'immunodéficience humaine (VIH) ; 2) de décrire le comportement sexuel et l'utilisation des préservatifs ; et 3) d'identifier les risques socio-démographiques et comportementaux associés avec l'absence d'utilisation du préservatif.

SCHÉMA : Etude transversale.

MÉTHODES : Patients consécutifs diagnostiqués comme tuberculeux entre janvier et décembre 2000 auxquels on a offert un accompagnement volontaire et un test VIH (VCT) et qui ont subi ultérieurement une interview.

RÉSULTATS : L'étude a permis d'enrôler 1.049 nouveaux patients TB. Parmi ceux-ci, 1.007 (96%) ont bénéficié d'un accompagnement pré-test, 955 (91%) ont eu un test VIH et 912 (87%) ont eu un accompagnement post-test. Le test VIH a été refusé par 44 patients (4%). Le taux global d'infection par le VIH a été de 76%. On a placé sous cotrimoxazole 691 patients TB, représentant 94% de l'ensemble des patients TB séropositifs pour le VIH. Des relations sexuelles ont été signalées par 479 patients TB (49%), dont 6% seulement utilisaient toujours les préservatifs. On a noté que les rapports sexuels non protégés étaient associés avec le fait d'avoir des symptômes TB depuis plus d'un mois, avec celui d'avoir moins de 8 ans de formation scolaire, d'être célibataire, divorcé ou veuf ou d'avoir des relations sexuelles avec le même partenaire.

CONCLUSIONS : Le taux d'acceptation de l'offre du VCT aux patients tuberculeux a été très élevé dans ce contexte ; il donne l'occasion de renforcer et d'intégrer les programmes TB et VIH.

RESUMEN

OBJETIVO : Se realizó un estudio en pacientes nuevos registrados con tuberculosis (TB) en un distrito rural de Malawi, para 1) verificar la aceptabilidad del acompañamiento voluntario y del test del virus del inmunodeficiencia humana (VIH), 2) describir el comportamiento sexual y el uso de preservativos y 3) identificar los factores de riesgo sociodemográficos y comportamentales asociados con el no uso de preservativos.

DISEÑO : Estudio transversal.

MÉTODO : Pacientes consecutivos con diagnóstico de TB entre enero y diciembre de 2000 a quienes se ofreció un acompañamiento voluntario y un test VIH (VCT) y que fueron entrevistados posteriormente.

RESULTADOS : En este estudio se enrolaron 1.049 pacientes nuevos con TB. De éstos, 1.007 (96%) tuvieron un acompañamiento antes del test, 955 (91%) tuvieron un test VIH y 912 (87%) tuvieron un acompañamiento después del test. Rehusaron el test 43 pacientes (4%). La tasa global de infección VIH fue de 77%. Se trataron con cotrimoxazol 691 pacientes tuberculosos, lo que representa el 94% de todos los pacientes con TB positivos para el VIH. Señalaron tener relaciones sexuales 479 pacientes con TB (49%), de los cuales sólo el 6% usaban siempre preservativos. Las relaciones sexuales no protegidas estaban asociadas con la presencia de síntomas de TB desde hacía más de un mes, con el hecho de tener menos de 8 años de educación escolar, con el hecho de ser soltero, divorciado o viudo o de tener relaciones sexuales con la misma pareja.

CONCLUSIÓN : La tasa de aceptación del VCT a los pacientes con TB fue elevada en este contexto y da la ocasión para reforzar e integrar los programas de TB y VIH.