Treatment outcomes of new adult tuberculosis patients in relation to HIV status in Zimbabwe

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Setting: All public health facilities in Chitungwiza District, Zimbabwe.

Objective: To determine, in new tuberculosis (TB) patients registered in 2009, 1) the proportion of persons human immunodeficiency virus (HIV) tested, stratified by age, sex and type of TB, and 2) treatment outcomes in relation to type of TB and HIV status.

Design: Retrospective cohort study.

Results: Of 1800 TB patients, 1100 (61%) were tested, of whom 877 (80%) were HIV-positive and 75 (9%) were documented as receiving antiretroviral treatment (ART). HIV testing and HIV positivity were similar between patients with different types of TB. Overall, the treatment success rate was 70%, and 17% had transferred out. Being HIV-positive on ART was associated with better treatment success and lower transfer out; age ≥ 55 years was associated with poor treatment success and higher death rates. Defaulting was more common in those who did not undergo smear testing or in extra-pulmonary TB patients, while deaths were higher in males.

Conclusion: In a Zimbabwe district, less than two thirds of TB patients were tested. Better treatment success was observed in patients documented as HIV-positive and on ART. Important lessons for improved TB control include increasing HIV testing uptake for better access to ART, more comprehensive recording practices on ART and better reporting on true outcomes of transfer-out patients.

Zimbabwe, a country in central southern Africa with an estimated population of 13.5 million, is currently suffering from a large epidemic of human immunodeficiency virus infection (HIV) and tuberculosis (TB). Zimbabwe ranks nineteenth on the list of the world's 22 high TB burden countries.¹ In 1990, the country's TB incidence rate was 329 cases per 100 000 population, but by 2009 this had increased to 742/100 000.¹ The overwhelming reason for the resurgence of TB has been the HIV/AIDS (acquired immunodeficiency syndrome) pandemic,² which has been particularly devastating in Zimbabwe and other Southern African countries.³ The HIV-1 epidemic became established in Zimbabwe in the mid-1980s, and its subsequent spread was extremely rapid.⁴ HIV prevalence peaked in 1997, when it was estimated to be 29% among the population aged ≥ 15 years.⁵ Since then, HIV prevalence has declined, but was estimated to be 14% in the adult population in 2010.⁶ This decline has been attributed to behavioural change and the impact of mortality.⁷

According to national figures reported to the World Health Organization (WHO) for 2009, 61% of TB patients received HIV testing and counselling (HTC), of whom 78% were reported to be HIV-positive.¹ For the 2008 cohort, 75% of HIV-positive TB patients were placed on cotrimoxazole preventive therapy (CPT) and 28% received antiretroviral treatment (ART) during anti-tuberculosis treatment.¹ In 2008, the treatment success rate for new smear-positive pulmonary tuberculosis (PTB) was reported at 74%.¹ It is important that HIV-positive TB patients are identified and placed on CPT and ART, as these adjunctive therapies are crucial interventions in reducing case fatality.⁸

In a country such as Zimbabwe, TB patients who are not tested for HIV are likely to be co-infected; however, without a confirmatory HIV test they do not have access to HIV care and treatment. We hypothesised that TB patients who are not HIV-tested may have worse treatment outcomes than those who are HIV-negative and those who are HIV-positive and on ART. Data from the National TB Programme (NTP) have not been analysed to support or refute such a hypothesis. We therefore set out to determine the treatment outcomes of new TB patients registered over a 12-month period in relation to age, sex, type of TB and HIV status. Specific objectives were to determine 1) the proportion of patients who were HIV tested, stratified by age, sex and type of TB, and 2) the treatment outcomes, particularly treatment success, of these different types of TB patients in relation to HIV status.

METHODS

Study design

This was a retrospective cohort study of TB patients using routine programme data.

Setting

Chitungwiza, the study area, is a high density dormitory town, situated approximately 20 km from Zimbabwe's capital city, with a population of approximately 322 000.⁹

Diagnosis and management of TB in Chitungwiza

All health institutions in the public sector in Chitungwiza that diagnose, register and treat TB patients were included in the study. These consisted of a government referral hospital, Chitungwiza Central Hospital, and four polyclinics under the city health department. While all facilities provide TB treatment services, only

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KEY WORDS

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the central hospital provides a TB diagnostic service, and this is the site to which all suspects were sent for sputum smear examination in 2009.

All PTB suspects first have sputum specimens examined by direct smear microscopy for acid-fast bacilli (AFB). Those with AFB-positive smears are diagnosed as smear-positive PTB, while the others are referred for a chest radiograph (CXR). If the latter is suggestive of TB, the patients may be diagnosed as smear-negative PTB or PTB with smear testing not performed. Extra-pulmonary TB (EPTB) is mainly diagnosed on clinical grounds with supporting specific diagnostic tests.¹⁰ Patients diagnosed as having TB are then referred back to their respective health centres for treatment.

TB patients are registered in the district TB register and are treated with standardised anti-tuberculosis regimens.¹⁰ All new TB patients (patients who have never received anti-tuberculosis treatment in the past or have previously taken anti-tuberculosis drugs for <30 days) are treated with a standardised 6-month regimen consisting of a 2-month initial phase of rifampicin (RMP), isoniazid (INH), pyrazinamide and ethambutol, followed by a 4-month continuation phase of RMP and INH.¹⁰ Patients are monitored throughout anti-tuberculosis treatment. For patients with smear-negative PTB and EPTB the monitoring is clinical, but for those with smear-positive PTB sputum smears are tested at 2, 4 and 6 months. Smear-negative patients who complete treatment and smear-positive patients who complete treatment with or without negative smears are regarded as 'successfully completing treatment'. Cohort analyses of registered TB patients are carried out to declare standardised WHO TB treatment outcomes 12 months after the start of TB treatment.¹

TB patients are routinely offered HTC at the time of TB diagnosis: in 2009, this was done using a parallel-testing algorithm.¹¹ HIV-infected TB patients are counselled and are meant to receive CPT for the full duration of TB treatment. First-line ART is supposed to be initiated within 2–8 weeks after the start of anti-tuberculosis treatment, irrespective of CD4 count and site of TB disease.¹² HIV-infected TB patients are referred to the ART centre at the government referral hospital, where they are started on efavirenz-based first-line ART.

Participants, data variables and data collection

All new adult TB patients (aged ≥ 15 years) registered in the District TB register kept at the government referral hospital for Chitungwiza from 1 January to 31 December 2009 were included in the study. Information was obtained from the TB register, which was examined between October 2010 and February 2011. Data variables abstracted into a structured form included TB registration number, age, sex, type of TB, HIV status (HIV test performed/not performed, HIV-positive and HIV-negative), and for those HIV-positive whether the patient was on ART. Standardised TB treatment outcomes were recorded from the TB register.¹⁰ Data on ART for HIV-infected TB patients were not available in the TB register in 2009, and for this reason information was obtained from the ART register for Chitungwiza District.

Analysis and statistics

Patient data in the structured report form were coded and double entered by two independent data entry clerks into EpiData version 3.1 (EpiData Association, Odense, Denmark) and cleaned for errors and analysed using STATA version 10 (Stata Corporation, College Station, TX, USA). Associations between categorical variables were determined by the χ^2 test and, alternatively, Fisher's

exact test. Poisson regression with robust error variance was used to calculate crude and adjusted relative risks (RRs) for associations between HIV status, type of TB, age, sex and the primary outcome (TB treatment success). RRs were calculated as they are desirable for common outcome events in cohort studies.¹³ A Poisson regression model with the robust error variance option was chosen to minimise the 95% confidence interval (CI) widths for calculated relative risks.¹⁴

Ethics and approval

Ethics approval was obtained from the Medical Research Council of Zimbabwe (MRCZ) and The Union Ethics Advisory Group, Paris, France.

RESULTS

Characteristics of patients with TB

A total of 1800 adult patients were registered with new TB, of whom 934 (52%) were female. The median age of all patients at the time of registration was 36 years (interquartile range 29–44). Results of HIV testing and documented referral of HIV-infected TB patients for ART are shown in the Figure. Of all TB patients, 61% were HIV tested, of whom 80% were HIV-positive, but less than 10% of these patients were documented as receiving ART. There were no data in the registers about initiation of CPT for HIV-positive TB patients.

The results of HIV testing in relation to type of TB, sex and age group are shown in Table 1. HIV testing and HIV positivity were similar between patients with different types of TB ($P = 0.575$ and $P = 0.631$, respectively). However, more females were tested (621/934, 66%) compared to males (479/866, 55%, $P < 0.001$). The association between age and being HIV tested ($P < 0.001$) was statistically significant: those aged ≥ 55 years (41%) were the least

FIGURE HIV status and documented referral for ART among new tuberculosis patients registered in Chitungwiza District, Zimbabwe, January–December 2009. TB = tuberculosis; HIV = human immunodeficiency virus; ART = antiretroviral treatment.

TABLE 1 HIV testing and status in relation to TB type, sex and age

Variable	Registered patients <i>n</i>	HIV tested <i>n</i> (%)	<i>P</i> value*	HIV-positive <i>n</i> (%)	<i>P</i> value
All patients	1800	1100 (61)	—	877 (80)	—
Type of TB†					
Smear-positive PTB	533	326 (61)	0.575	263 (81)	0.631
Smear-negative PTB	587	365 (62)		293 (80)	
Smear not performed, PTB	459	283 (62)		226 (80)	
EPTB	220	126 (57)		95 (75)	
Sex					
Female	934	621 (66)	<0.001	506 (81)	0.216
Male	866	479 (55)		371 (77)	
Age group, years					
<25	180	93 (52)	<0.001	56 (60)	<0.001
25–44	1181	772 (65)		635 (82)	
45–54	246	155 (63)		135 (87)	
≥55	193	80 (41)		51 (64)	

* χ^2 test for association.

†1 patient with unknown type of TB was excluded.

HIV = human immunodeficiency virus; TB = tuberculosis; PTB = pulmonary tuberculosis; EPTB = extra-pulmonary tuberculosis.

tested, while those aged 25–44 years were the most (65%). The highest rates of HIV infection were observed in those aged 45–54 years (87%).

TB treatment outcomes in relation to type of TB and HIV status

Treatment outcomes for all TB patients in relation to HIV status, types of TB, sex and age group are shown in Table 2. Treatment success was shown in 70% of patients, with adverse outcomes dominated by ‘transfers out’. Of those transferring out, 153 (50%)

were HIV-positive with undocumented ART status; most transfer out patients (210/307, 68%) were aged 25–44 years. On multivariate analysis, treatment outcomes between patients with different types of TB were largely similar, apart from higher default rates in those who had not undergone smear testing (adjusted RR 1.86, 95%CI 1.14–3.05) and in EPTB patients (RR 2.08, 95%CI 1.19–3.63) than in smear-positive PTB patients. Deaths were higher in males (adjusted RR 1.56, 95%CI 1.07–2.59) than among females. Other comparisons between groups were non-significant.

Crude and sex- and age-adjusted RRs for predictors of TB

TABLE 2 TB treatment outcomes for all TB patients in relation to HIV status, TB type, sex and age

Variable	Registered patients <i>n</i>	Treatment outcome*				
		Treatment success <i>n</i> (%)	Death <i>n</i> (%)	Defaulter <i>n</i> (%)	Transfer out <i>n</i> (%)	Treatment failure <i>n</i> (%)
All patients	1800	1263 (70)	105 (6)	118 (7)	307 (17)	1 (<1)
HIV status†						
HIV not performed	685	477 (70)	43 (6)	51 (7)	110 (16)	1 (<1)
HIV-positive‡	877	615 (70)	52 (6)	50 (6)	158 (18)	0
HIV-positive on ART	75	62 (83)§	3 (4)	5 (7)	5 (7)§	0
HIV-negative	197	137 (70)	9 (5)	15 (8)	35 (18)	0
Type of TB¶						
Smear-positive PTB	533	391 (73)	30 (6)	24 (5)	87 (16)	1 (<1)
Smear-negative PTB	587	423 (72)	30 (5)	34 (6)	98 (17)	0
Smear not performed, PTB	459	298 (65)	30 (7)	39 (9)#	89 (20)	0
Extra-pulmonary TB	220	150 (68)	15 (7)	21 (10)#	33 (15)	0
Sex						
Female	934	665 (71)	42 (5)	67 (7)	156 (17)	1 (<1)
Male	866	598 (69)	63 (7)**	51 (6)	151 (17)	0
Age group, years						
<25	180	128 (71)	9 (5)	18 (10)	23 (13)	0
25–44	1181	840 (71)	56 (5)	72 (6)	210 (18)	0
45–54	246	174 (71)	18 (7)	14 (6)	38 (15)	1 (<1)
≥55	193	121 (63)††	22 (11)††	14 (7)	36 (19)	0

*6 patients with missing treatment outcomes were excluded.

†26 patients with HIV-indeterminate results and 15 patients with unrecorded HIV testing and counselling status were excluded.

‡Includes those documented and not documented to be on ART.

§*P* < 0.05 compared with HIV testing not performed using multivariate Poisson regression.

¶1 patient with unknown type of TB excluded using multivariate Poisson regression.

#*P* < 0.05 compared with smear-positive PTB using multivariate Poisson regression.***P* < 0.05 compared with females using multivariate Poisson regression.††*P* < 0.05 compared with age group <25 years using multivariate Poisson regression.

TB = tuberculosis; HIV = human immunodeficiency virus; ART = antiretroviral treatment; PTB = pulmonary TB.

TABLE 3 Adjusted RR for TB treatment success

Variable	Treatment success n (%)	RR (95%CI)	Adjusted RR (95%CI)*	P value
HIV status				
HIV testing not performed	477 (70)	Reference	Reference	
HIV-positive, ART not documented	553 (69)	0.97 (0.88–1.06)	0.96 (0.87–1.06)	0.373
HIV-positive, on ART	62 (83)	1.16 (1.02–1.32)	1.16 (1.02–1.32)	0.028
HIV-negative	137 (70)	1.01 (0.86–1.18)	1.00 (0.85–1.18)	0.999
Type of TB				
Smear-positive PTB	391 (73)	Reference	Reference	
Smear-negative PTB	423 (72)	1.02 (0.94–1.12)	1.03 (0.94–1.13)	0.468
Smear not performed, PTB	298 (65)	0.97 (0.86–1.09)	0.97 (0.86–1.10)	0.600
EPTB	150 (68)	0.99 (0.85–1.14)	1.00 (0.87–1.15)	0.971
Sex				
Female	665 (71)	Reference	Reference	
Male	598 (69)	0.97 (0.90–1.06)	0.99 (0.91–1.08)	0.795
Age group, years				
<25	128 (72)	Reference	Reference	
25–44	840 (71)	0.91 (0.75–1.09)	0.91 (0.75–1.10)	0.316
45–54	174 (71)	0.92 (0.74–1.12)	0.92 (0.74–1.14)	0.450
≥55	121 (63)	0.79 (0.63–0.99)	0.77 (0.63–0.95)	0.015

*RRs adjusted for sex and age using Poisson regression with robust error variance. RR >1.0 indicates better treatment success, while <1 indicates worse treatment success.

RR = relative risk; TB = tuberculosis; CI = confidence interval; HIV = human immunodeficiency virus; ART = antiretroviral treatment; PTB = pulmonary TB; EPTB = extra-pulmonary TB.

treatment success are shown in Table 3. Overall, HIV-positive TB patients documented to be on ART had a better treatment success (adjusted RR [aRR] 1.16, 95%CI 1.02–1.32) and significantly fewer transfer-outs (aRR 0.41, 95%CI 0.17–0.97) than those not HIV-tested; treatment success was significantly lower (aRR 0.79, 95%CI 0.63–0.99) and death rates were higher (aRR 2.14, 95%CI 1.0–4.5) in patients aged ≥55 years than among those aged <25 years (aRR 0.79, 95%CI 0.63–0.95).

DISCUSSION

This study in Chitungwiza District showed very high HIV prevalence among registered TB patients, irrespective of type of TB. Important significant findings with regard to treatment outcomes were better treatment success and fewer transfers out in documented HIV-infected TB patients known to be on ART, worse treatment success and higher death rates in those aged ≥55 years, more defaulting in those with smears not performed or with EPTB and more deaths in males.

Apart from those HIV-infected patients known to be on ART, treatment outcomes in this study among patients who were not HIV-tested, HIV-positive and HIV-negative were similar; this finding differs from previous studies where HIV-positive patients had worse treatment outcomes and higher death rates than HIV-negative patients.¹⁵ The reasons for our findings are not obvious. However, the main adverse treatment outcome was transfer out, meaning that patients were transferred to another health facility and the treatment outcomes were not reported back to the referring unit. The true outcomes in the transfer out groups could have varied between those with different HIV testing status, and could have included different case fatality rates between those who were HIV-negative and those with unknown HIV status, i.e., the high rates of transfers out could have hidden varying mortality rates between the different HIV status groups.

Four other findings and implications from this study were important. First, only 61% of patients registered with TB were HIV tested. Given the high HIV prevalence, it would have been prefer-

able to have a much higher testing uptake. HIV testing was more common in females than in males, and better strategies to recruit males for HIV testing need to be found.

Second, <10% of HIV-infected TB patients were documented as receiving ART during TB treatment from the ART facility in Chitungwiza, and this is well below the national average.¹ Possible reasons for the low uptake of ART include 1) poor ART initiation in HIV-infected TB patients in Chitungwiza, or 2) the system used to collect ART data in this study missed patients who had been started on ART in another district. It would be preferable to have ART data in all TB registers, and this was initiated during 2010. Better integration of HIV and TB activities in health facilities may also improve linkages and ART uptake.

Third, the high transfer out rate among patients adversely impacted TB treatment outcomes, effectively meaning a high proportion of patients with an unknown outcome. Although there are difficulties in routinely and regularly reporting transfer out and transfer in patients in the programme setting,¹⁶ further studies should be conducted to trace the outcomes of these mobile patients, as this mostly affects HIV-positive patients who may have transferred to access ART in other districts. This is an area where improvements are needed.

Fourth, almost 30% of patients with PTB had no sputum smears documented in the TB register. The high percentage of smears not performed was attributed to a poor emphasis on TB diagnosis by sputum smear examination in Chitungwiza District, with these patients being diagnosed by clinical findings and CXR. This is contrary to international and national TB treatment guidelines, which recommend sputum smear examination in all adults with suspected PTB.^{1,10} Use of these guidelines is supported by a Kenyan study which showed that TB diagnosis by direct smear microscopy followed by CXR is more cost-effective compared to diagnosis by CXR alone.¹⁷

This was a district-based study, where data were collected for TB patients under routine programmatic conditions. The study included large numbers of patients, and we believe that the results are representative of the national situation. The study also

adhered to STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for the reporting of observational data.¹⁸ However, there are limitations, mainly related to the fact that data were retrospectively collected from registers where completeness and accuracy of data are difficult to ensure. An important limitation of our study is the lower proportion of transferred out patients among HIV-positive patients on ART compared to other patient groups. This is probably due to the fact that these patients were registered in the Chitungwiza District register, and were therefore more likely to access TB treatment and ART locally. This may partly explain their better treatment outcomes in comparison to other patients. Our findings may also be limited by lack of data on TB treatment, adherence to ART and severity of HIV disease, which may have confounded the relationship between HIV status and TB treatment success.

In conclusion, there is a need to increase HIV testing rates among TB patients, particularly males, and if they are referred to HIV treatment and care this may improve their TB treatment outcomes. Better recording practices of ART access in the district TB registers are needed to enable better assessment of HIV treatment coverage. Strengthening the follow-up of treatment outcomes in transferred out patients will also allow a better analysis of the relationship between HIV status and TB treatment success. With respect to the NTP, improvements are needed in sputum smear examinations among PTB suspects, as this is more cost-effective than diagnosis by CXR alone. Further research should be conducted to establish the true TB treatment outcomes of transferred out patients.

References

- World Health Organization. Global tuberculosis control. WHO report 2010. WHO/HTM/TB/2010.7. Geneva, Switzerland: WHO, 2010.
- Corbett E L, Watt C J, Walker N, et al. The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Arch Intern Med* 2003; 163 (Suppl 9): S1009–S1021.
- United States Agency for International Development. HIV/AIDS health profile sub-Saharan Africa. Washington DC, USA: USAID, 2011. http://www.usaid.gov/our_work/global_health/aids/Countries/africa/hiv_summary_africa.pdf Accessed October 2011.
- National AIDS Council, Ministry of Health and Child Welfare. The HIV and AIDS epidemic in Zimbabwe. Harare, Zimbabwe: Ministry of Health and Child Welfare, 2004.
- National AIDS Council. Zimbabwe country report (January 2008–December 2009). United Nations General Assembly special session report on HIV and AIDS. Follow-up to the declaration of commitment on HIV and AIDS. New York, NY, USA: UNAIDS, 2010. http://www.unaids.org/en/dataanalysis/monitoringcountryprogress/2010progressreportsubmittedbycountries/zimbabwe_2010_country_progress_report_en.pdf Accessed October 2011.
- Ministry of Health and Child Welfare. Zimbabwe national HIV and AIDS estimates 2009. Harare, Zimbabwe: Ministry of Health and Child Welfare, 2009.
- Gregson S, Gonesse E, Hallet T, et al. HIV decline in Zimbabwe due to reductions in risky sex? Evidence from a comprehensive epidemiological review. *Int J Epidemiol* 2010; 39: 1311–1323.
- Harries A D, Zachariah R, Corbett E L, et al. The HIV-associated tuberculosis epidemic—when will we act? *Lancet* 2010; 375: 1906–1919.
- Chitungwiza Informations. City Chitungwiza in Zimbabwe. Chitungwiza, Zimbabwe: Chitungwiza Informations, 2011. <http://athia.org/zimbabwe/chitungwiza.html> Accessed October 2011.
- Ministry of Health and Child Welfare. Zimbabwe National Tuberculosis Control Programme manual. 3rd ed. Harare, Zimbabwe: Ministry of Health and Child Welfare, 2007.
- Ministry of Health and Child Welfare. National HIV testing and counselling trainee's manual. Harare, Zimbabwe: Ministry of Health and Child Welfare, 2007.
- National Drug and Therapeutics Policy Advisory Committee, Ministry of Health and Child Welfare. Guidelines for antiretroviral therapy in Zimbabwe. Harare, Zimbabwe: Ministry of Health and Child Welfare, 2007.
- McNutt L A, Wu C, Xue X, Hafner J P. Estimating the relative risk in cohort studies and clinical trials of common outcomes. *Am J Epidemiol* 2003; 157: 940–943.
- Zou G. A modified poisson regression approach to prospective studies with binary data. *Am J Epidemiol* 2004; 159: 702–706.
- Mukadi Y D, Maher D, Harries A D. Tuberculosis case fatality rates in HIV prevalence populations in sub-Saharan Africa. *AIDS* 2001; 15: 143–152.
- Meijnen S, Weismuller M M, Claessens N J M, Kwanjana J H, Salaniponi F M L, Harries A D. Outcome of patients with tuberculosis who transfer between reporting units in Malawi. *Int J Tuberc Lung Dis* 2002; 6: 666–671.
- van Cleef M R A, Kivihya-Ndugga L E, Meme H, Odhiambo J A, Klatser P R. The role and performance of chest X-ray for the diagnosis of tuberculosis: a cost-effectiveness analysis in Nairobi, Kenya. *BMC Infect Dis* 2005; 5: 111.
- von Elm E, Altman D G, Egger M, Pocock S J, Gøtzsche P C, Vandenbroucke J P, for the STROBE initiative. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Lancet* 2007; 370: 1453–1457.

Contexte : Tous les services de santé publique dans le District de Chitungwiza au Zimbabwe.

Objectif : Déterminer chez les nouveaux patients atteints de tuberculose (TB) en 2009 : 1) la proportion testée pour le virus de l'immuno-déficience humaine (VIH), avec stratification par âge, sexe et type de TB ; et 2) les résultats du traitement en relation avec le type de TB et le statut VIH.

Schéma : Etude rétrospective de cohorte.

Résultats : Sur 1800 patients TB, 1100 (61%) ont été testés, parmi lesquels 877 (80%) étaient séropositifs pour le VIH ; chez 75 (9%) un traitement antirétroviral (ART) était signalé. Les tests VIH et la séro-positivité VIH ont été similaires chez les patients atteints de différents types de TB. Dans l'ensemble, les taux de succès du traitement ont été de 70% et les transferts vers d'autres services s'élèvent à 17%. Le fait d'être séropositif pour le VIH et sous ART est associé avec un meilleur

leur résultat du traitement et un plus faible taux de transfert. Un âge ≥ 55 ans est en association avec de médiocres résultats du traitement et des taux plus élevés de décès. L'abandon est plus courant chez ceux dont les frottis n'avaient pas été exécutés ou qui étaient atteints de TB extra-pulmonaire, alors que les décès ont été plus fréquents chez ceux de sexe masculin.

Conclusion : Dans un district du Zimbabwe, moins de deux tiers des patients TB ont été testés pour le VIH et les résultats du traitement ont été meilleurs chez les patients documentés comme séropositifs pour le VIH et sous ART. Comme mesures importantes en vue d'une meilleure maîtrise de la TB, il faut citer une meilleure utilisation du test VIH en vue d'un meilleur accès à l'ART, des pratiques d'enregistrement plus complètes sur l'ART et une amélioration des rapports concernant les vrais résultats chez les patients transférés vers d'autres services.

Marco de referencia: Todos los establecimientos de atención de salud del Distrito de Chitungwiza en Zimbabwe.

Objetivo: Determinar en los pacientes registrados como casos nuevos de tuberculosis (TB) en el 2009, la proporción que recibió la prueba diagnóstica de infección por el virus de la inmunodeficiencia humana (VIH), con estratificación en función de la edad, el sexo y el tipo de TB; se estudiaron además los desenlaces terapéuticos según la presentación clínica de la enfermedad y la situación frente al VIH.

Método: Fue este un estudio retrospectivo de cohortes.

Resultados: De los 1800 pacientes registrados con TB, 1100 (61%) recibieron la prueba diagnóstica del VIH, cuyo resultado fue positivo en 877 casos (80%) y se confirmó que 75 pacientes (9%) estaban recibiendo tratamiento antirretrovírico (ART). La proporción de pacientes en quienes se practicó la prueba del VIH y la positividad del resultado fue equivalente en los grupos con las diferentes presentaciones clínicas de la TB. En general, la tasa de éxito terapéutico fue 70% y se transfirieron a otros centros 17% de casos. Se observó que

un resultado positivo frente al VIH y la administración del ART se asociaban con un mejor desenlace terapéutico y que la baja tasa de transferencias y la edad ≥ 55 años eran factores que se asociaban con desenlaces desfavorables y tasas más altas de mortalidad; el abandono del tratamiento fue más frecuente en los pacientes que no contaban con baciloscopia del esputo y en los casos de TB extrapulmonar. La mortalidad fue mayor en los hombres.

Conclusión: En este distrito de Zimbabwe, se efectuó la prueba diagnóstica del VIH en menos de dos tercios de los casos de TB y los pacientes con infección por el VIH que recibían ART presentaron desenlaces terapéuticos más favorables. Estos resultados aportan enseñanzas importantes en el perfeccionamiento del control de la TB, como son la utilidad de aumentar la aceptabilidad de la prueba diagnóstica de la infección por el VIH a fin de ampliar el acceso al ART, fomentar la exhaustividad de las prácticas de registro de estos pacientes y lograr una mayor precisión en la notificación del desenlace terapéutico real de los pacientes transferidos a otros centros durante el tratamiento.