'Transfer out' tuberculosis patients: treatment outcomes after cross-checking registers, 2012–2013, Lusaka, Zambia

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Setting: Lusaka, Zambia.

Objective: To assess the actual treatment outcomes of 'transfer out' (TO) cases at a diagnostic centre in Lusaka, in the third and fourth quarters of 2012, and to see the impact of this cross-check in treatment success rates (TSR) in 2013 and early 2014.

Design and method: In this retrospective cohort study, treatment outcomes for new bacteriologically positive tuberculosis (TB) cases referred from the diagnostic centre were reviewed and compared with those at the receiving treatment units.

Results: Of 49 (58%) cases referred to three treatment units, the treatment outcomes of nine had to be updated at the diagnostic centre, which reduced the proportion of TO cases from 17.6% to 11.8% and increased the TSR to 70.6% from 64.7%.

Conclusion: The review and cross-checking of the TB registers at the diagnostic and treatment units led to a significant reduction in non-assessed cases, suggesting that the TB registers in the diagnostic and treatment units should be cross-checked regularly. There is also need for a complementary intervention to reduce the proportion of TOs associated with high loss to follow-up and non-evaluated TO rates.

It is fairly common for tuberculosis (TB) patients to seek diagnostic and treatment services at a different health facility in large urban settings, either because of the location of a diagnostic centre or due to stigma and discrimination, in addition to other reasons.^{1,2} As a consequence, a considerable proportion of patients with TB are referred to the health facility nearest to them for continued management of the disease. This calls for special attention to be paid to the design of the TB control programmes for urban areas. Although the World Health Organization (WHO)³ and country national TB programme (NTP) guidelines stipulate that the actual treatment outcomes of those who were transferred out should be retrieved, the outcomes may not be fully known, contributing to a lower treatment success rate (TSR).^{4,5}

The present study was undertaken to determine the actual treatment outcomes of patients with TB at a large TB diagnostic centre in Lusaka, Zambia, focusing particularly on patients who were transferred or referred from the diagnostic centre to the peripheral treatment units, and to evaluate the impact of the cross-check on the TSR.

MATERIALS AND METHODS

Case definition and study design

A new bacteriologically positive TB case was defined as a person with a biological specimen positive on smear microscopy, culture or Xpert® MTB/RIF (Ceipheid, Sunnyvale, CA, USA), who had never been treated for TB or had taken anti-tuberculosis drugs for less than 1 month. A non-evaluated transferred out patient was defined as a patient for whom no treatment outcome was assigned, which includes cases that were transferred out to another treatment unit.⁶

This was a 6-month retrospective cohort study of new bacteriologically positive TB patients, focusing particularly on those who transferred out.

Settings

Lusaka, with a population of 2.3 million, representing 16% of the total population of the Republic of Zambia, is centrally located, which gives it strategic importance, as it is easily accessible from all parts of the country. Chelston is one of the 23 TB diagnostic centres in Lusaka, catering for 5% of the capital's population. Chelston was chosen for this study mainly due to its moderate number of TB cases: it has an incidence rate of 668 per 100 000 population of all types of TB, and registers about 700 cases each year, of whom on average 50% reside outside the Chelston catchment area. Chelston had an average TSR of 64.7% and a non-evaluated transfer-out rate of 17.6% between 1 July and 31 December 2012. Three peripheral treatment centres, Chainda Health Centre, Kamanga Clinic and Kaunda Square Health Centre, hereafter referred to respectively as treatment units [TU] 1, 2, and 3, were recipients of over 90% of the patients transferred out from Chelston. Chainda and Kaunda Square are government health centres, while Kamanga is a non-governmental organisation (NGO) treatment unit.

Patient samples

All new bacteriologically positive TB patients registered at the Chelston clinic from 1 July through 31 December 2012 were enrolled in the study for cross-checking.

Data collection procedures, variables collected, and validation

The study was conducted in July 2014. The TB treatment and laboratory registers and patient treatment cards were reviewed at the diagnostic centre. Variables on each new bacteriologically positive TB patient transferred out from the diagnostic centre were re-

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KEY WORDS

tuberculosis; epidemiology; transfer out; treatment outcomes

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TABLE Cohort analyses of new bacteriologically positive TB cases registered at Chelston Health Centre before and after the cross-check, 1 July–31 December 2012

	Total <i>n</i> (%)	TSR <i>n</i> (%)	Cured <i>n</i> (%)	TC <i>n</i> (%)	Died <i>n</i> (%)	TF <i>n</i> (%)	LTFU <i>n</i> (%)	TO <i>n</i> (%)
Before cross-check	85 (100)	55 (64.7)	40 (47.1)	15 (17.6)	4 (4.7)	2 (2.3)	9 (10.6)	15 (17.6)
After cross-check	85 (100)	60 (70.6)	44 (51.8)	16 (18.8)	5 (5.8)	2 (2.3)	8 (9.4)	10 (11.8)
Difference, %		+5.9	+4.7	+1.2	+1.1	0	-1.2	-5.8

TB = tuberculosis; TSR = treatment success rate; TC = treatment completion; TF = treatment failure; LTFU = loss to follow-up; TO = transferred out and not evaluated.

corded. The variables included name, age, sex, TB registration and laboratory registration identification numbers, treatment outcome and treatment unit where the patient had been transferred. This was followed by a visit to each of the three peripheral treatment units where the information for the eligible patients from the diagnostic centre was cross-checked with that of the TB registers and treatment cards of the treatment units. Discrepancies were resolved by checking against the diagnostic centre laboratory and the TB registers. Follow-up sputum examination results for patients who had decided to attend a different diagnostic centre were verified with those centres. It was therefore a back-and-forth exercise. The agreed status for the treatment outcome of each patient was then noted. During these visits, in-depth discussions were held with the TB corner out-patient clinic nurses to verify the patient records in their TB treatment register and to review supporting documents from the laboratory or TB treatment cards. Treatment outcomes for 2013 and the first three quarters of 2014 were also collected to see the impact of the intervention following the cross-check.

Data analysis and ethical considerations

The data were entered and analysed using Microsoft Excel (Microsoft Corp, Redmond, WA, USA). The study was considered part of the routine monitoring and evaluation activities of the Japan International Cooperation Agency/Japan Anti-Tuberculosis Association (JICA/JATA) Community Mobilization for Tuberculosis/Human Immunodeficiency Virus (TB/HIV) Care Project, and the Research Ethics Committee of the Research Institute of Tuberculosis, Tokyo, Japan, waived the need for ethical clearance for the study. The study team obtained written permission from the Lusaka District Community Health Office, Lusaka, Zambia, to conduct the study. The names of the patients were removed from the record once the team had cross-matched the data between the TB registers of the diagnostic and treatment units.

RESULTS AND ANALYSIS

Of 461 cases of all types of TB in the TB register of the diagnostic centre, 85 new bacteriologically positive TB cases were found. Of these, 36 (42.2%) remained at the diagnostic centre for treatment, while 49 (57.6%) were referred to three treatment units for continued treatment: 8 (9.4%) to TU 1, 16 (18.8%) to TU 2 and 25 (29.4%) to TU 3. All 49 cases were accounted for in the TB registers of the three TUs; the treatment outcomes of 40 (81.6%) had already been updated at the diagnostic centre. After the cross-check between the diagnostic centre and TUs, five cases whose treatment outcomes were initially determined as transferred out turned out to be cured (one case), treatment completed (three cases), or died (one case), while one initially declared as lost to follow-up was actually treatment completed. Three cases whose initial treatment outcomes were treatment

completed turned out to be cured after cross-checking with the laboratory TB register.

The results of the cohort analyses before and after the cross-check for the study population are shown in the Table, in line with the changes above. The improvement was largely attributed to the revision of the proportion of patients reported as 'transferred out/not evaluated' down from 17.6% to 11.8%. Consequently, the cure and treatment completion rates increased by 4.7% and 1.2%, respectively, and the TSR therefore increased by 5.9%.

The exercise continued between the diagnostic and the three TUs after the cross-check for the third and fourth quarters of 2012. The health centre management appreciated the outcome of the intervention and has been able to sustain it through the health centre monthly management costs. The TSR improved from 67% in 2012 to 89% in 2013, which is similar to the TSR of the entire district (89.4% in 2012), as has the cure rate (48% in 2012 to 80% in 2013) (Figure). This has also strengthened the rapport among health centre staff.

DISCUSSION

Brief summary

Our data revealed that a third of non-evaluated cases reported as transferred out or not evaluated were actually evaluated, as became clear during the cross-checking of records. The TSR increased by 5.9% in the third and fourth quarters of 2012. Following the intervention, the TB corner nurses started regular review meetings among the diagnostic centres and the TUs, and the TSR was increased to 89% on average in the 2013 cohort.

Strengths and limitations

This study included all the new bacteriologically positive TB cases in the study period. The result is representative of the subdistrict of Chelston area and unlikely to be biased, although it only covers a 6-month cohort.

Possible reasons for findings

Possible reasons why there were cases whose actual treatment outcomes were not known to the TB corner nurses at the diagnostic and treatment centres were limited transport and cell phone costs, meaning that nurses were unable to communicate and cross-check the TB and laboratory registers of the diagnostic and treatment units. Observations and literature reviews have also shown that poor treatment outcomes are generally linked to patient-related factors such as poor treatment adherence, probably caused by a lack of knowledge about TB, drug side effects, hunger, lack of family support and negative attitudes of health providers towards the patient.⁷ In this study, however, the health care providers tried to obtain the patient information but their efforts were curtailed by inadequate transport and cell-phone fees. Our exercise of cross-checking the TB registers between the

FIGURE Trend of treatment outcomes before and after the cross-check. TSR = treatment success rate; CR = cure rate; TO = transferred out and not evaluated.

centres may have further motivated the health care providers to make an additional effort, enabling them to improve the treatment outcomes, as shown in the 2013 and early 2014 cohorts (Figure).

We found only approximately 20% of all types of TB to be bacteriologically positive TB in the register. This was caused by widespread human immunodeficiency virus (HIV) infection among the TB cases (70–80% of TB cases in Lusaka are HIV-positive), the preference of clinicians for chest X-ray rather than smear microscopy, and/or shortages of sputum containers and glass slides.

Comparison with previous studies

This study was consistent with a study conducted in one of the largest urban health centres in Kampala, Uganda, which reported an increase in the proportion of patients evaluated from 28% in 2006 to 96% in 2007, resulting in an increased TSR of 73.1% in 2007, up from 17.2% in 2006.⁵ Enablers such as transport and telephone services in DOTS implementation were necessary to increase favourable treatment outcome rates.

CONCLUSION

This retrospective health centre-based study showed that the movement of TB patients between treatment centres poses a challenge in monitoring and evaluating TB control in urban settings such as Chelston. It also showed, however, that regular cross-checking of patient records between the diagnostic and treatment units is possible and goes a long way to updating the register. The recording and reporting of information must improve; this can be accomplished through training and supervision, and TSRs of >85% can thus be achieved. This improvement

could be sustainable if the health facility continues to receive funds from the district, as is currently the situation.

The district should provide routine monitoring and supervision to the TB diagnostic and treatment facilities as well as the appropriate funds to allow the facilities to continuously improve and maintain quality TB services for the community in Zambia, which has a high burden of TB. There is also a need for complementary interventions to reduce the proportion of transfer-out patients, which is associated with high loss to follow-up and transfer-out rates.

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Contexte : Lusaka, Zambie.

Objectif : Evaluer les vrais résultats du traitement des cas « transférés hors zone » (TO) dans un centre de diagnostic, à Lusaka, pendant les troisième et quatrième trimestres de 2012, et voir l'impact du croisement des informations dans le taux de succès du traitement (TSR) en 2013 et au début de 2014.

Schéma et méthode : Dans cette étude rétrospective de cohorte, les résultats du traitement de nouveaux cas de tuberculose (TB) à bactériologie positive qui avaient été référés du centre de diagnostic ont été revus et comparés à ceux de l'unité de traitement.

Résultats : Sur 49 cas (58%) qui ont été référés à trois unités de

traitement, les résultats du traitement de neuf cas ont dû être mis à jour au centre de diagnostic, ce qui a abouti à la réduction de la proportion de cas « TO » de 17,6% à 11,8% et à l'augmentation du TSR de 64,7% à 70,6%.

Conclusion : La revue et le croisement des registres TB des unités des centres de diagnostic et de traitement a abouti à une réduction significative des cas non évalués, ce qui suggère que les registres TB des unités de diagnostic et de traitement devraient être fréquemment croisés. Il y a également un besoin d'interventions complémentaires afin de réduire la proportion de TO, qui est associée à un taux élevé de perdus de vue et de cas non évalués.

Marco de referencia: La ciudad de Lusaka en Zambia.

Objetivo: Evaluar los desenlaces terapéuticos reales de los pacientes con tuberculosis (TB) 'transferidos a otro centro' (TO), en una unidad de diagnóstico de Lusaka durante el tercero y cuarto trimestres del 2012 y examinar el efecto de la verificación cruzada de las tasas de éxito terapéutico (TSR) en el 2013 y comienzos del 2014.

Método: En el presente estudio retrospectivo de cohortes, se analizaron los desenlaces terapéuticos de los casos nuevos de TB con confirmación bacteriológica de una unidad diagnóstica que se remitieron a otros centros y se compararon con los resultados obtenidos en las unidades de tratamiento que los recibieron.

Resultados: Se remitieron 49 pacientes (58%) del centro diagnóstico

a tres unidades de tratamiento. Faltaba la actualización del desenlace terapéutico de nueve de estos pacientes en el centro de diagnóstico y tras la verificación cruzada, disminuyó la proporción de casos TO de 17,6% a 11,8% y la TSR aumentó de 64,7% a 70,6%.

Conclusión: La revisión y la verificación cruzada de los registros de TB de las unidades de diagnóstico y las unidades de tratamiento dio lugar a una disminución considerable de los casos clasificados como no evaluados, lo cual destaca la necesidad de cotejar con frecuencia los registros de tuberculosis de las diferentes unidades. Se precisan intervenciones complementarias encaminadas a disminuir la proporción de TO, las cuales se asocian con una alta tasa de pérdida durante el seguimiento y de casos TO no evaluados.