Tuberculosis treatment outcomes among retreatment patients registered by private practitioners in Myanmar

A. N. Win,¹ M. E. Edginton,² S. G. Hinderaker,³ N. N. Minn,¹ A. K. Linn¹

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The objectives of this retrospective cohort study were to report treatment outcomes and identify factors associated with treatment failure among all retreatment tuberculosis (TB) patients registered in the public-private mix DOTS programme of Populations Services International–Myanmar over 6 years. Among 3643 retreatment patients, 2657 (73%) were successfully treated and 309 (8.5%) failed. This study shows that retreatment patients who have failed treatment for their first TB episode are almost twice as likely to fail a second time (13.5%). We have identified some key programmatic challenges associated with retreatment TB in the private sector, and steps are being taken to address this issue.

Myanmar is one of the 22 countries with the highest burden of tuberculosis (TB) and the 27 countries with the highest burden of multidrug-resistant TB (MDR-TB) in the world. Anti-tuberculosis treatment is offered by both the public and private sectors in Myanmar. Since 2004, Populations Services International (PSI), a non-governmental organisation working closely with the National TB Programme (NTP) in Myanmar, has embarked on public-private mix for DOTS (PPM-DOTS).¹ PSI is responsible for organising the training, monitoring and cohort reporting of the PPM-DOTS programme in the private sector.

Retreatment TB patients were defined as patients who had previously received ≥ 1 month of anti-tuberculosis treatment who are smear-positive or -negative and who have disease at any site. They were further classified as relapse, failure, lost to follow-up and other, based on the outcome of their most recent course of treatment.² Retreatment patients have a higher risk of treatment interruption and of failure, leading to a greater risk of developing and transmitting drug-resistant TB.^{3,4}

We were interested to know the outcomes for retreatment patients under the PSI-Myanmar PPM-DOTS programme. The study objectives were 1) to report on treatment outcomes of retreatment patients, and 2) to identify factors associated with treatment failure.

METHODS

Study design

This was a retrospective cohort study of retreatment TB patients registered in the PSI-Myanmar PPM-DOTS programme.

Study setting

PSI-Myanmar has been working in Myanmar (58 million population in 2009)⁵ to provide training, supervision and technical support for private practitioners who offer TB diagnostic and treatment services. This work is conducted in close collaboration with the NTP, and covers 192 townships in Myanmar. All TB patients are managed in accordance with national guidelines.⁶ Retreatment TB cases start retreatment without prior drug susceptibility testing (DST), which is only available to patients who reside in the two main cities.

Study participants

The study included all retreatment TB patients registered with PSI-Myanmar's PPM-DOTS programme from April 2004 to September 2010.

Data and analysis

Data obtained from the electronic TB register included the TB registration number, age, sex, retreatment subtypes (relapse, failure, loss to follow-up and other), treatment interruption (yes/no) and number of days of interruption. TB treatment outcomes included cured, completed, failure, loss to follow-up, died and transfer out, as per national guidelines.⁶ Data were analysed using EpiData (EpiData Association, Odense, Denmark) and measures of risk were determined using relative risks (RRs).

Ethics approval

The study was approved by the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease, Paris, France, and PSI-Myanmar.

RESULTS

There were 3651 TB patients registered for retreatment during the period studied (April 2004 to September 2010) under the PSI-Myanmar PPM-DOTS programme. Eight patients were diagnosed as not having TB by physicians; these were excluded from further analysis. Of the remaining 3643 patients, 2657 (73%) were successfully treated (cured and completed) and 309 (8.5%) failed retreatment: 151 (7.6%) among relapsed patients, 139 (13.5%) among failures and 17 (4.6%) among those lost to follow-up (Table 1).

Table 2 shows factors associated with retreatment failure. Failure was a more common outcome among patients retreated after failure than after relapse (RR 1.76, 95% confidence interval [CI] 1.42–2.2). Other categories were not significantly different. Half of the patients who interrupted treatment were not followed up.

AFFILIATIONS

- 1 Populations Services International, Mandalay, Myanmar
- 2 International Union Against Tuberculosis and Lung Disease, Paris, France
- 3 Centre for International Health, University of Bergen, Bergen, Norway

CORRESPONDENCE

Aung Naing Win
Populations Services International–Myanmar
No. Ma/15
Corner Theikpan St & 56th St
Maha Aung Myae Township
Mandalay, Myanmar
Tel: (+95) 2 77589
Fax: (+95) 1 527668
e-mail: anwin@psimyanmar.org

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KEY WORDS

PSI-Myanmar; PPM-DOTS; operational research

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TABLE 1 Treatment outcomes of retreatment tuberculosis patients by subtypes* in private clinics, Myanmar, 2004–2010

	Relapse <i>n</i> (%)	Failure <i>n</i> (%)	Return after loss to follow-up <i>n</i> (%)	Other <i>n</i> (%)	Total <i>n</i> (%)
Cured	1379 (69.5)	601 (58.2)	253 (67.8)	0	2233 (61.3)
Completed	135 (6.8)	72 (7.0)	22 (5.9)	195 (76.8)	424 (11.6)
Lost to follow-up	69 (3.5)	90 (8.7)	40 (10.7)	17 (6.7)	216 (5.9)
Died	146 (7.4)	48 (4.6)	20 (5.4)	28 (11.0)	242 (6.7)
Failed	151 (7.6)	139 (13.5)	17 (4.6)	2 (0.8)	309 (8.5)
Transferred out	103 (5.2)	83 (8.0)	21 (5.6)	12 (4.7)	219 (6.0)
Total	1983 (100)	1033 (100)	373 (100)	254 (100)	3643 (100)

*Retreatment following relapse, failure, loss to follow-up and other.

DISCUSSION

This is the first study to evaluate treatment outcomes among retreatment TB patients in the private sector in Myanmar. Although the overall treatment success rate was 73%, patients who were placed on the regimen due to failure of their first TB episode were 76% more likely to fail a second time. Furthermore, among patients who were noted to have interrupted treatment, almost half were lost to follow-up, posing a challenge to the TB programme. Loss to follow-up may be due to death, relocation to another district or facility for treatment, refusal to take treatment or other reasons.

The strengths of this study are that it involves data from a rou-

TABLE 2 Factors associated with failure among retreatment TB patients registered with private clinics, Myanmar, 2004–2010

Variables	Total patients <i>n</i>	Retreatment failure outcome <i>n</i> (%)	RR (95%CI)
Sex			
Male	2523	211 (8.4)	Reference
Female	1128	98 (8.7)	1.04 (0.83–1.31)
Age, years			
<15	8	2 (25)	Reference
15–34	1190	107 (8.9)	0.36 (0.11–1.21)
35–54	1688	150 (8.9)	0.36 (0.11–1.19)
≥55	765	50 (6.5)	0.26 (0.08–0.89)
Type of retreatment TB			
Relapse	1983	151 (7.6)	Reference
Failure	1033	139 (13.5)	1.76 (1.42–2.2)
Loss to follow-up	373	17 (4.6)	0.59 (0.36–0.97)
Other	254	2 (0.8)	0.1 (0.02–0.4)
Treatment interruption			
No interruption	3241	287 (8.9)	Reference
Interruption and no loss to follow-up	208	22 (10.5)	1.2 (0.8–1.8)
Interruption and loss to follow-up	202	Not available	

TB = tuberculosis; RR = relative risk; CI = confidence interval.

time programme and PPM-DOTS in the private sector, and is thus likely to be a reflection of the reality in the field. Treatment outcomes were cross-checked against patient treatment cards and covered several years, with a large cohort of TB patients. A limitation is that we were unable to trace patients who were lost to follow-up and we thus have no information on their true outcomes, some of which might have been failures.

There are two main programmatic implications of the study findings. First, a patient who failed first-line anti-tuberculosis treatment was more likely to fail again. The programme should give extra attention to such patients to ensure success, with close follow-up and tracing where needed. Second, treatment interruptions need to be followed up by programme staff to determine why they occur. Failure to identify reasons for interruption is a serious shortcoming of the programme. Ways to address this could include: 1) adherence counselling on treatment by a properly trained counsellor; 2) careful registration of patients' addresses and their mobile phone numbers to allow active tracing; 3) vigilance in reporting early treatment interruptions; and 4) specific research to identify reasons for loss to follow-up in this setting.

In conclusion, we have identified some key programmatic challenges associated with retreatment TB in the private sector, and steps are being taken to address them.

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Les objectifs de cette étude rétrospective de cohorte ont été de rapporter les résultats du traitement et d'identifier les facteurs en association avec les échecs de traitement chez tous les patients TB en retraitement dans un programme PPM-DOTS du programme Population Services International–Myanmar au cours d'une période de 6 années. Parmi 3643 patients en retraitement, 2657 (73%) ont été traités avec succès et 309 (8,5%) ont échoué. Cette étude montre que les

patients en retraitement par suite d'un échec du traitement de leur premier épisode de TB sont presque deux fois plus susceptibles d'échouer une deuxième fois (13,5%). Nous avons identifié un certain nombre de défis-clé du programme en rapport avec le retraitement de la TB dans le secteur privé ainsi que les étapes à parcourir pour résoudre ce problème.

Los objetivos del presente estudio retrospectivo de cohortes fueron notificar los desenlaces terapéuticos y definir los factores asociados con el fracaso del tratamiento, en los pacientes con tuberculosis (TB) que iniciaron un esquema de retratamiento en el marco de una colaboración publicoprivada de suministro de DOTS del programa Population Services International de Myanmar durante 6 años. De los 3643 pacientes inscritos en retratamiento, 2657 (73%) lograron un tratamiento exitoso y en 309 (8,5%) ocurrió un fracaso. Los resultados

del estudio indican que los pacientes que se encuentran en retratamiento por causa del fracaso terapéutico de su primer episodio de TB tienen una probabilidad casi dos veces mayor de sufrir un segundo fracaso (13,5%). El trabajo permitió definir algunos obstáculos programáticos relacionados con el retratamiento de la TB en el sector privado y se están adoptando las medidas encaminadas a resolver el problema.