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Double trouble: tuberculosis and substance abuse in Nagaland, India

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The diagnosis and treatment of tuberculosis (TB) in people who use and/or inject illicit drugs (PWUIDs) remains a barrier to achieving universal coverage for TB in India and globally. This report describes treatment outcomes in PWUIDs who received treatment for drug-susceptible TB at the Mon District Hospital in Nagaland, India, during 2012–2013. The median age of the patients was 39 years, and most (92%) were male. Two thirds (33/49) of the patients had a successful TB treatment outcome. A previous TB episode and residence in a semi-urban area were associated with unsuccessful treatment outcomes. Separate diagnostic and treatment algorithms, including regular adherence counselling and opioid substitution therapies, should be considered for PWUIDs.

With a staggering estimated 2.2 million cases of active tuberculosis (TB) annually, India is home to more than a quarter of the 8.6 million TB cases estimated to occur each year around the world.[1] India's Revised National Tuberculosis Control Programme (RNTCP) has adopted many strategies to achieve universal coverage of TB treatment among vulnerable population groups, including injectable drug users (IDUs). However, the diagnosis and treatment of active TB in substance abusers, also known as people who use and/or inject illicit drugs (PWUIDs), remains a challenge in the fight to eliminate TB in India.

Those in the north-eastern part of India represent a significant proportion of the population with substance abuse problems involving alcohol, tobacco, opium and heroin.[2] About 29% of the 180 000 IDUs across the country live in the north-east,[3] of whom one third live in the states of Manipur, Mizoram and Nagaland.[4] The prevalence of human immunodeficiency virus (HIV) infection in Nagaland is amongst the highest in India, estimated at 0.73% in adults (age 15–49 years),[3] 2.7 times the national prevalence (0.27%). IDUs are highly affected by the HIV epidemic in Nagaland.[5] PWUIDs are also at high risk for TB[6] due to associated factors such as poverty, unemployment, malnutrition, stigma, complex treatment needs and limited access to health care.

TB treatment among PWUIDs has been discussed in a number of publications from different parts of the country, including north-eastern India. However, none of these studies have reported findings from Nagaland. The present article describes the TB treatment outcomes among PWUIDs enrolled in a TB programme supported by Médecins Sans Frontières (MSF) in Mon, India, including a number of patients from Myanmar.

This was a retrospective cohort study of PWUIDs initiated on first-line anti-tuberculosis treatment at the Mon District Hospital, Nagaland, between April 2012 and December 2013. Study patients were diagnosed with TB either by smear microscopy, or, if smear-negative, using the Xpert® MTB/RIF assay (Cepheid, Sunnyvale, CA, USA) and/or chest X-ray. In accordance with the RNTCP treatment algorithm, patients received directly observed treatment in the Mon designated microscopy centre (DMC), as described elsewhere.[7] Information on history of opium/heroin use was recorded during the enrolment of patients in the TB programme. Patients and their family members underwent treatment awareness and adherence counselling at treatment initiation and during follow-up by counsellors in the Mon DMC.

The MSF Ethics Review Board, Geneva, Switzerland, approved the study and waived the need for informed consent, as the study involved the review of existing records.

A total of 49 TB patients with a final TB outcome and a history of smoking opium with/without injecting heroin within one year prior to initiation of anti-tuberculosis treatment were included in the study (Table 1). The majority of these patients were male (91.8%). Of the 43 cases with a recorded HIV status, none were HIV co-infected. All of the patients were opium smokers, of whom 14.3% had an additional history of injection drug use (heroin). Just over half (53.1%) had a prior episode of TB. A quarter of the patients had smear-negative (24.5%) pulmonary disease.

Overall, two thirds (33/49, 67.3%) of the patients had a successful treatment outcome, recorded as cured or completed treatment (Table 2). Of the 16 patients with an unsuccessful outcome, six died, six were lost to follow-up and four failed treatment. Bivariate and multivariate regression models, including age, sex, residence and previous history of TB as explanatory variables, showed that two variables were significantly associated with an unsuccessful treatment outcome: a previous history of TB (adjusted odds ratio [aOR] 5.49, 95% confidence interval [CI] 1.21–25.04) and residence in a semi-urban area, i.e., Mon Town, where the district hospital was located (aOR 4.98, 95%CI 1.13–22.06).

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KEY WORDS
opium; IDU; adherence; operational research

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TABLE 1 Demographic and clinical characteristics of substance abuse patients receiving tuberculosis treatment in Mon district, Nagaland, India, 2012–2013

Characteristics	Tuberculosis patients on treatment (*n* = 49) *n* (%)
Age, years	
0–15	–
16–25	9 (18.4)
26–35	10 (20.4)
36–45	17 (34.7)
⩾46	13 (26.5)
Sex	
Male	45 (91.8)
Female	4 (8.2)
Residence	
Rural	33 (67.3)
Semi-urban	16 (32.7)
Substance abuse pattern	
Opium smoking	42 (85.7)
Injection drug use and opium smoking	7 (14.3)
HIV co-infected* (*n* = 43)	0
TB site	
Pulmonary, smear-positive	34 (69.4)
Pulmonary, smear-negative	12 (24.5)
Extra-pulmonary	3 (6.1)
Previous episode of TB	
Yes	26 (53.1)
No	23 (46.9)

*Patients with recorded HIV status.
HIV = human immunodeficiency virus; TB = tuberculosis.

Unsuccessful treatment outcomes were more common in this cohort compared to a previous study among the general population in the same district (33% vs. 26%).[7] Although the study findings were limited by the small number of patients, the poor treatment outcomes in this study indicate an urgent need for a model of care specifically tailored for PWUIDs, with a focus on treatment literacy and adherence counselling that takes into account history of substance abuse and socio-cultural norms.

PWUIDs need special attention in TB programmes (Table 3). First, the group should be routinely screened for TB symptoms, as they are known to be at high risk of developing active TB disease.[6] The Standards of TB Care in India (STCI) recommend the screening of TB in high-risk groups such as HIV-infected individuals, patients suffering from diabetes/malnourishment, miners and health care workers, but overlook PWUIDs.[8] Second, as TB diagnosis can be more complicated in this vulnerable group (a quarter of the cohort had smear-negative TB), access to more sensitive molecular diagnostic testing, such as Xpert, is important as it can avoid delays in diagnosis and treatment.

The majority of PWUIDs in the cohort had had a previous episode of TB, which may indicate non-completion/failure of previous anti-tuberculosis treatment. As these retreatment patients had an increased risk of having a drug-resistant strain of TB, drug susceptibility testing (DST) was offered on clinical suspicion of treatment failure. However, according to national TB guidelines,[9] DST should be offered before initiation of anti-tuberculosis treatment in retreatment TB patients.

The majority of semi-urban resident PWUIDs had a history of multiple substance abuse (opium and heroin), likely contributing to the unsuccessful treatment outcomes. Furthermore, the inherent behaviour of PWUIDs in tribal populations such as these often deters them from accessing care for their clinical condition.[6] Thus, innovative community-based interventions that include the involvement of IDU network groups should be considered to improve adherence among similar patients during anti-tuberculosis treatment.[10] Whenever possible, a vertical approach to the management of infectious diseases should be avoided in PWUIDs; the diagnosis and management of infections should instead be available at the primary health care level.

National TB programmes should devise separate diagnostic and treatment algorithms that take into account policies aimed at curbing illicit drug abuse, plus criminalisation legislature related to PWUIDs,[3] drug substitution therapies, nutritional support[6] and

TABLE 2 Demographic and clinical factors associated with unsuccessful treatment outcome among substance abuse patients receiving TB treatment in Mon district, Nagaland, India, 2012–2013

Explanatory variable	Unsuccessful outcome* (*n* = 16) *n* (%)	Successful outcome† (*n* = 33) *n* (%)	χ^2/*t*-test (*P* value)	aOR‡ (95%CI)
Age, years, median [IQR]	39 [30–50]	39 (29–48)	0.48 (0.64)	1.03 (0.98–1.08)
Sex				
Male	14 (31.1)	31 (68.9)	0.59 (0.58)	
Female	2 (50.0)	2 (50.0)		1.76 (0.18–17.12)
Residence				
Semi-urban	9 (56.3)	7 (43.8)	6.02 (0.01)§	4.98 (1.13–22.06)
Rural	7 (21.2)	26 (78.8)		
TB site				
Pulmonary	15 (32.6)	31 (67.4)	–	–
Extra-pulmonary	1 (33.3)	2 (66.7)		
Previous episode of TB				
Yes	13 (50.0)	13 (50.0)	7.58 (0.01)‡	5.49 (1.21–25.04)
No	3 (13.0)	20 (87.0)		

*Unsuccessful treatment outcome (*n* = 16): died (6/16), lost to follow-up (6/16), failed treatment (4/16).
†Successful treatment outcome (*n* = 33): cured (14/33), completed treatment (19/33).
‡Binary logistic regression.
§$P < 0.05$.
TB = tuberculosis; aOR = adjusted odds ratio; CI = confidence interval; IQR = interquartile range.

TABLE 3 Suggested additions to TB programme policy and practice for PWUIDs

Suggestions
Include PWUIDs among high-risk groups for TB
Systematically offer the Xpert® MTB/RIF assay to all PWUIDs with presumptive TB, and if rifampicin-positive, offer patients DST for first- and second-line TB drugs
Prioritise patients residing in urban/semi-urban areas and those with a history of previous TB treatment
Ensure treatment literacy and adherence counselling for patients and family members
Involve PWUID networks and peers in adherence initiatives
Revise criminalisation legislature related to PWUIDs
Introduce opioid substitution therapy at all levels of care, preferably integrated with TB services

TB = tuberculosis; PWUIDS = people who use and/or inject illicit drugs; DST = drug susceptibility testing.

effective monitoring systems. Mon District Hospital has recently started to provide opioid substitution therapies (i.e., oral administration of buprenorphine) to PWUIDs, who are often referred from the HIV and TB programmes. This may help to improve adherence to anti-tuberculosis treatment among PWUIDs, assisting in treatment completion. Although we did not identify adverse events related to interactions between illicit drugs and anti-tuberculosis medications in our study, more research needs to be carried out to understand such possible drug interactions.

References

1 Government of India, Ministry of Health & Family Welfare, Central TB Division. TB India 2014. Revised National TB Control Programme Annual Status Report: Reaching the unreached—find, treat, cure TB, save lives. New Delhi, India: Directorate General of Health Services, Ministry of Health & Family Welfare, 2014.
2 Pal H R, Kumar A. Epidemiology of substance use. In: Lal R, ed. Substance use disorders: manual for physicians. New Delhi, India: National Drug Dependence Treatment Centre, 2006.
3 Government of India, Ministry of Health & Family Welfare, National AIDS Control Organisation. Annual Report 2013–2014. New Delhi, India: Government of India, Ministry of Health & Family Welfare, 2014.
4 World Health Organization, Regional Office for South-East Asia. Report on people who inject drugs in the South-East Asia region. New Delhi, India: WHO SEARO, 2010.
5 Das H K, Goswami A, Sonowal R, Das M K. Assessment of HIV/AIDS sero-positivity rate in the state of Nagaland, North-East India. Int Res J Medical Sci 2014; 2: 17–23.
6 Getahun H, Baddeley A, Raviglione M. Managing tuberculosis in people who use and inject illicit drugs. Bull World Health Organ 2013; 91: 154–156.
7 Das M, Isaakidis P, Shenoy R, et al. Self-administered tuberculosis treatment outcomes in a tribal population on the Indo-Myanmar border, Nagaland, India. PLOS One 2014; 9: e108186.
8 Government of India, Ministry of Health & Family Welfare, Central TB Division and World Health Organization. Standards for TB care in India. New Delhi, India: WHO Country Office India, 2014. http://www.searo.who.int/india/mediacentre/events/2014/stci_book.pdf Accessed June 2015.
9 Government of India, Ministry of Health & Family Welfare, Central TB Division. Guidelines on programmatic management of drug resistant TB in India. New Delhi, India: Directorate General of Health Services, Ministry of Health & Family Welfare, 2012. http://www.tbcindia.nic.in/pdfs/Guidelines%20for%20PMDT%20in%20India%20-%20May%202012.pdf Accessed June 2015.
10 Ricks P M, Hershow R C, Rahimian A, et al. A randomized trial comparing standard outcomes in two treatment models for substance users with tuberculosis. Int J Tuberc Lung Dis 2015; 19: 326–332.

Le diagnostic et le traitement de la tuberculose (TB) chez les personnes qui consomment et/ou s'injectent des drogues (PWUID) constitue encore un obstacle à l'atteinte d'une couverture universelle de la TB en Inde et dans le monde. Ce rapport décrit les résultats du traitement de PWUID qui ont bénéficié d'un traitement de TB pharmacosensible à l'hôpital Mon District de Nagaland, Inde, en 2012–2013. L'âge médian des patients a été de 39 ans et la majorité (92%) étaient des hommes. Les deux tiers (33/49) des patients ont eu un bon résultat thérapeutique. L'existence d'un épisode préalable de TB et le fait de résider en zone semi-urbaine ont été associés à un échec thérapeutique. Des algorithmes séparés de diagnostic et de traitement, incluant des séances régulières de conseil pour l'observance et des traitements de substitution aux opiacés, devraient être envisagées pour les PWUID.

El diagnóstico y el tratamiento de la tuberculosis (TB) en las personas que consumen o se inyectan drogas (PWUID) siguen creando obstáculos al cumplimiento de la cobertura universal de la TB en la India y en el mundo. En el presente informe se describe el desenlace terapéutico en personas de este grupo que recibieron un tratamiento por TB normosensible en el hospital Mon District de Nagaland, en la India, del 2012 al 2013. La mediana de la edad de los pacientes fue 39 años y la mayoría (92%) era de sexo masculino. Dos tercios de los pacientes (33 de 49) alcanzaron un desenlace favorable del tratamiento antituberculoso. Se asociaron con los desenlaces desfavorables el antecedente de un episodio TB y la residencia en una zona periurbana. Se propone que en las personas que consumen o se inyectan drogas se consideren diferentes algoritmos de diagnóstico y tratamiento que comprendan orientación en materia de cumplimiento y un tratamiento de sustitución de opioides.

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