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Low pre-diagnosis attrition but high pre-treatment attrition among patients with MDR-TB: An operational research from Chennai, India

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ABSTRACT

Background: Worldwide, there's concern over high pre-diagnosis and pre-treatment attritions or delays in Multidrug resistant tuberculosis (MDR-TB) diagnosis and treatment pathway (DTP). We conducted this operational research among patients with presumptive MDR-TB in north and central Chennai, India to determine attrition and turnaround times (TAT) at various steps of DTP and factors associated with attrition.

Methods: Study was conducted in Revised National Tuberculosis Control Programme setting. It was a retrospective cohort study involving record review of all patients with presumptive MDR-TB (eligible for DST) in 2014.

Results: Of 628 eligible for DST, 557 (88%) underwent DST and 74 (13%) patients were diagnosed as having MDR-TB. Pre-diagnosis and pre-treatment attrition was 11% (71/628) and 38% (28/74) respectively. TAT [median (IQR)] to test from eligibility for DST and initiate DR-TB treatment from diagnosis were 14 (9,27) and 18 (13,36) days respectively. Patients with smear negative TB and detected in first quarter of 2014 were less likely to undergo DST. Patients in first quarter of 2014 had significantly lower risk of pre-treatment attrition.

Conclusion: There was high uptake of DST. However, urgent attention is required to reduce pre-treatment attrition, improve TAT to test from eligibility for DST and improve DST among patients with smear-negative TB.

1. Background

Tuberculosis (TB) is a major public health problem worldwide and the control of TB faces major threat from the increase in multidrug-resistant tuberculosis (MDR-TB). In recent times, access to Drug Susceptibility Testing (DST) for patients with TB has increased [1]. However, gaps in the diagnosis and treatment pathway (DTP) of MDR-TB remain. Worldwide studies have raised concern over high attrition and/or delays in MDR-TB DTP [2–8]. Of the estimated 300,000 MDR-TB among notified TB cases globally, around 123,000 (41%) patients with MDR-TB were diagnosed and of them 90% were initiated on treatment [1].

India with the highest burden of TB and MDR-TB accounts for more than one fifth of the global TB burden [1]. There were an

Abbreviations: DR-TB, drug resistant tuberculosis; MDR-TB, multidrug resistant tuberculosis; DST, drug susceptibility testing; DTP, diagnosis and treatment pathway; RNTCP, revised national tuberculosis programme; PMDT, programmatic management of drug resistant tuberculosis; OR, operational research; TAT, turnaround time; DTC, district tuberculosis centre; TU, tuberculosis unit; DMC, designated microscopy centre; SNRL, supranational reference laboratory; LPA, line probe assay; FUS+, follow up smear positive; IQR, interquartile range; RR, relative risk; CI, confidence interval; DOTS, directly observed treatment short course.

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estimated 71,000 MDR-TB cases among the notified TB patients in 2014 and only 25,748 cases were notified giving a case notification rate of 36% [1]. This further drops to 26% if we considered the total estimated incidence of MDR-TB in India (~99,000 cases per year) [9]. The Revised National Tuberculosis Control Programme (RNTCP) has adopted the Stop TB strategy recommended Programmatic Management of Drug-resistant TB (PMDT) for effective delivery of drug resistant tuberculosis services since 2006 [10].

Prompt identification of presumptive MDR-TB patient (one who is eligible for DST), diagnosis of MDR-TB and initiation of treatment are crucial to prevent the transmission of disease and reduce related high morbidity and mortality [11]. RNTCP has limited cohort-wise information on whether all presumptive MDR-TB patients are identified and investigated for MDR-TB diagnosis as the cohort analysis under RNTCP begins from those who were offered DST. There is also paucity of data regarding the delays and factors causing pre-diagnosis and pre-treatment delay in the MDR-TB DTP. To our knowledge, there are only three published studies from India [3,12,13]. Systematic review of the DTP with representation from various states in India is required. Operational issues are unique and differ from region to region especially in a large country like India. Understanding these will aid programme managers working at national and local level to strengthen PMDT services.

Considering this, we conducted a multi-centre operational research (OR) across districts in India. Here we report the findings related to DTP among patients with presumptive MDR-TB in Chennai, India, for the year 2014. Specific objectives were to determine the i) number (proportion) with pre-diagnosis attrition and pre-treatment attrition ii) turn-around time (TAT) for various steps in DTP (including time to DST and time to initiate treatment) and iii) clinical and demographic factors associated with attrition.

2. Methods

2.1. Study setting

2.1.1. General setting

Chennai is one of the metropolitan cities of India and is the capital of Tamil Nadu state. It has a population of approximately 7 million and is situated along the south-east coast with Bay of Bengal in the east. The study was conducted in North and Central regions of Chennai after consulting the programme managers. (Fig. 1) RNTCP infrastructure includes one District TB Centre (DTC), 26 sub-district level programme management units (Tuberculosis Units - TU) and 52 designated microscopic centres (DMCs) for sputum smear examination. Among 52 DMCs, 7 are located in medical colleges, 7 in district level hospital and 38 in primary/secondary level health centres and one in a private facility.

2.1.2. PMDT services

In Chennai, DST services are provided in the Supra National Reference Laboratory (SNRL) situated at National Institute for

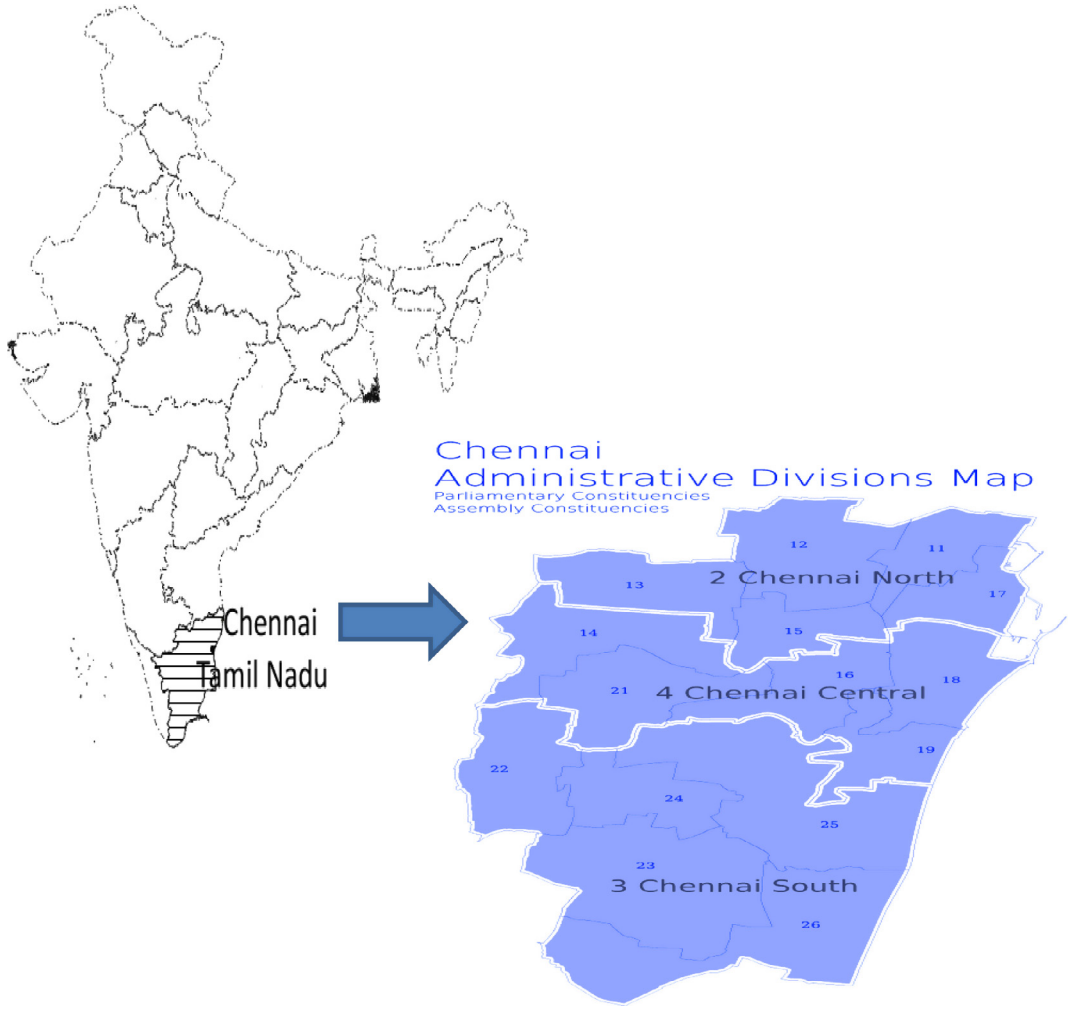

Fig. 1. North and Central Chennai, Tamil Nadu, India.

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