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Research Article

TUBERCULOSIS CONTROL IN INDIA: STRATEGIES, PROGRESS AND CHALLENGES

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ABSTRACT

Tuberculosis is a worldwide, chronic communicable bacterial disease and important cause of death in many parts of world, especially in India. Of the 8.6 million cases,2.2(25%)million cases occurred in India making India the world's highest tuberculosis burden country.1 The national tuberculosis control program was started in 1962 with the aim to detect cases at the earliest but later it was included in prime minister's 20 points program. The RNTCP program was launched in pilot basis in 1993. The RNTCP has expanded over the years and since March 2006, it covers the whole country. RNTCP has successfully involved 261 medical colleges, over 2900 NGOs, 17000 private practitioners and over 150 corporate sector health units. DOTS plus servicesfor the management of MDR TB have been rolled out in the states of Gujarat and Maharashtra in 2007.

INTRODUCTION

Tuberculosis is a worldwide, chronic communicable bacterial disease and important cause of death in many parts of world, especially in India. Of the 8.6 million cases, 2.2(25%) million cases occurred in India making India the world's highest tuberculosis burden country (www.tbcindia.nic.in.). With the implementation of revised national TB control programme the incidence for tuberculosis has reduced from 216/lakh/year in 1990 to 176 in 2012 and similarly the prevalence from 465 to 230/lakh/year during the same period. since inception 3.1 million deaths attributable to TB have been averted and mortality rate has come down from 38/lakh/year in 1990 to 22/lakh/year in 2012 (www.tbcindia.nic.in/pdfs/tb% 20india%202014.pdf). The Republic of India is the seventh largest country by geographical area and the second most populous country in the world. The total population of India is 1.21 billion (2011 census). India is the largest democracy of the world consisting of 29 states and 7 union territories. The states of India are further divided into 640 districts (http://www.censusindia.gov.in/2011census/PCA/PCA_Highlights/pca_highlights_file/India/Chapter-1.pdf). Tuberculosis is a public health problem in almost every parts of the country, high burden states are Uttar Pradesh, Rajasthan, Maharastra, Andhra Pradesh, Delhi.

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History of tuberculosis control of India: The national tuberculosis control program was started in 1962 with the aim to detect cases at the earliest but later it was included in prime minister's 20 points program. Later on in the district, the program was supplemented through the District tuberculosis centre (DTC) and the primary health care institutions. The district tuberculosis program was supported by the state level organisation for the coordination and supervision of program. This program was operational in most of the districts till it was replaced by Directly Observed Treatment Short course (DOTS) strategy. In 1992, a nationwide review was conducted with the assistance of Swedish International Development Agency (SIDA) and World Health Organisation (WHO). With the help of many studies it was observed that the program has not made any improvement in the disease status.

The revised strategy was introduced in the country in a phased manner as pilot phase 1, pilot phase II and pilot phase III. By the end of 1998, only 2 % of the total population of India was covered by Revised National Tuberculosis Control Program (RNTCP). Large scale implementation began in late 1998. The RNTCP has expanded over the years and since March 2006, it covers the whole country. The RNTCP has now entered into its second phase in which the program aims to consolidate the gains made to date ,to widen services in terms of activities and to assess and to sustain the achievements. India's TB control programme is on track as far as reduction in disease burden is concerned. There is 42% reduction in TB mortality rate by

2012 as compared to 1990 level. Similarly there is 51% reduction in TB prevalence rate by 2012 as compared to 1990 level (www.tbcindia.nic.in).

Progress of the RNTCP

RNTCP has been recognised for the fastest expansion of DOTS in the world, with over 55 fold expansions in RNTCP coverage since 1998, leading to total coverage of the country in March 2006. RNTCP has successfully involved 261 medical colleges, over 2900 NGOs, 17000 private practitioners and over 150 corporate sector health units. DOTS plus services or the management of MDR TB have been rolled out in the states of Gujarat and Maharashtra in 2007 (www.tbcindia.nic.in).By 2015 drug susceptibility testing will be made available to all smear positive cases registered under the program. RNTCP and the NACO have devised a joint action plan for TB HIV coordination in order to reduce TB associated morbidity and mortality in people living with HIV/AIDS.

RNTCP in the 12th five year plan: The theme of National strategic plan 2012-17 is "Universal access for quality diagnosis and treatment for all TB patients in the community" with a target of "reaching the unreached".

Plan to stop tuberculosis: The stop TB partnership has developed a global plan to stop TB that covers the period 2006-2015 .the stop TB partnership's vision is a TB free world. The stop TB strategy includes six components: 1.pursuing high quality DOTS expansion and enhancement, 2.addressing TB/HIV ,MDR-TB and other challenges, 3.Contributing to health system strengthening, 4.Engaging all care providers, 5. Empowering people with TB and communities, 6.Enabling and promoting research.

Laboratory Diagnosis of TB

Although *M. tuberculosis* is capable of causing disease in almost any organ of the body, more than 85% of tuberculosis disease in India is pulmonary. All patients (adults, adolescents, and children who are capable of producing sputum) with presumptive pulmonary TB should undergo quality-assured sputum test for rapid diagnosis of TB (with at least two samples, including one early morning sample for sputum smear for AFB) for microbiological confirmation. Where available, chest X-ray should be used as a screening tool to increase the sensitivity of the diagnostic algorithm. All specimens are examined by Ziehl-Neelsen staining technique.

Category	Type of patient	Regimens in months	Duration in Months
New cases	New sputum smear positive Seriously ill sputum negative Seriously ill extra pulmonary Sputum negative Extra pulmonary not seriously ill	2(HRZE)3+4(HR)3	6
Retreatment cases	Sputum positive relapse Sputum positive failure Sputum positive treatment after default	2(HRZES)3+1(HRZE)3 +5(HRE)3	8
MDR TB cases		6(9)KOEtCZE/18OEtCE	18-24

Patients in whom both specimens are smear negative should be prescribed symptomatic treatment and broad spectrum antibiotics. If the symptoms persist for after the course repeat sputum smear examination. If one or more smears are positive, the patient is diagnosed as smear positive pulmonary TB. If none is positive, a chest x ray is taken and if x ray is consistent with pulmonary TB, the patient is diagnosed as smear negative TB. Tuberculin Skin Test (TST) & Interferon Gamma Release Assay (IGRA) are not recommended for the diagnosis of active tuberculosis. Standardised TST may be used as a complimentary test in children. CB-NAAT (cartridge-based nucleic-acid amplification test) is the preferred first diagnostic test in children and PLHIV. Serological tests are banned and not recommended for diagnosing tuberculosis (Santha, 2005; Thomas, 2008).

Testing for extra-pulmonary TB: For all patients (adults, adolescents and children) with presumptive extra-pulmonary TB, appropriate specimens from the presumed sites of involvement must be obtained for microscopy/culture and drug sensitivity testing (DST)/CB-NAAT/molecular test/histo-pathological examination.

Diagnosis of multi-drug resistant TB (MDR-TB): Prompt and appropriate evaluation should be undertaken for patients with presumptive MDR-TB or Rifampicin (R) resistance in TB patients who have failed treatment with first line drugs, paediatric non responders, TB patients who are contacts of MDR-TB (or R resistance), TB patients who are found positive on any follow-up sputum smear examination during treatment with first line drugs, diagnosed TB patients with prior history of anti-TB treatment, TB patients with HIV co-infection and all presumptive TB cases among PLHIV. All such patients must be tested for drug resistance with available technology, a rapid molecular DST (as the first choice) or liquid / solid culture-DST (at least for R and if possible for Isoniazid (H); Ofloxacin (O) and Kanamycin (K), if R-resistant/MDR).Wherever available DST should be offered to all diagnosed tuberculosis patients prior to start of treatment (WHO, 2011).

Diagnosis of Extensively Drug Resistant TB (XDR-TB): On detection of Rifampicin resistance alone or along with isoniazid resistance, patient must be offered sputum test for second line DST using RNTCP approved phenotypic or genotypic methods, wherever available.

Diagnosis of HIV co-infection in TB patients: All diagnosed TB patients should be offered HIV counselling and testing (Cain, 2010).

Paediatric TB: Diagnosis of paediatric TB patients: In all children with presumptive intra-thoracic TB, microbiological confirmation should be sought through examination of respiratory specimens (e.g. sputum by expectoration, gastric aspirate, gastric lavage, induced sputum, broncho-alveolar lavage or other appropriate specimens) with quality assured

diagnostic test, preferably CB-NAAT, smear microscopy or culture.

Diagnosis of probable paediatric TB patients: In the event of negative or unavailable microbiological results, a diagnosis of probable TB in children should be based on the presence of abnormalities consistent with TB on radiography, a history of exposure to pulmonary tuberculosis case, evidence of TB infection (Positive TST) and clinical findings suggestive of TB.

Diagnosis of extra-pulmonary paediatric TB patients: For children with presumptive extra-pulmonary TB, appropriate specimens from the presumed sites of involvement should be obtained for rapid molecular test, microscopy, culture and DST, and histo-pathological examination (National Guidelines on Diagnosis and Treatment of Paediatric Tuberculosis, 2012).

Treatment of pediatric tuberculosis: Though intermittent therapy remains the same, children with severe disseminated disease, neuro tuberculosis and severely ill children having likelihood of vomiting and intolerance to oral drugs, an initial daily supervised therapy during their stay in the hospital is needed.

After discharge they will be taken on thrice weekly DOT regimen with adjustment in the dose according to weight of the child.

TB- HIV collaboration: TB is the most common opportunistic infection and cause of mortality among people living with HIV (PLHIV), difficult to diagnose and treat owing to challenges related to co-morbidity, pill burden, co-toxicity and drug interactions (National Guidelines on Diagnosis and Treatment of Paediatric Tuberculosis, 2012).

DISCUSSION

In 2012, India's golden jubilee year of TB control, the WHO named India the worst performer among developing nations, with 17 per cent of the global population carrying 26 per cent of the global TB burden. With mass application, disease treatment does not become disease control. That 85% cure of 70% cases will not control TB in India where prevalence is high. There are several reasons why TB has not been controlled by current efforts. Control has to be defined in such a manner that its trajectory can be monitored over time; currently no such monitoring is included in the TB control program in India. Not only focusing on symptomatic patients we must start surveillance for asymptomatic TB patients also.

Social determinants are equally important to control TB, as poverty and overcrowding helps in transmission of TB. Cough etiquette is one of the most important control measures to prevent TB transmission. Britain and Singapore are reputed to have banned spitting in public places to reduce air-borne TB transmission. Why can't we take a stand to improve over sanitation and hygiene, lets support 'Swachh Bharat Abhiyan' and prevent not only TB transmission but other air borne transmission too.

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