NATIONAL TUBERCULOSIS INSTITUTE'S CONTRIBUTION AND SUPPORT TO THE PEOPLE OF KARNATAKA IN TB CONTROL

HD Surendra, GA Manjunath & SR Kusuma*

INTRODUCTION

The National Tuberculosis Institute (NTI), the dream of several concerned and like minded individuals interested in finding a long lasting solution to the huge problem of tuberculosis (TB) in the country, was established towards the middle of 20th century in Bangalore. The late Pandit Jawaharlal Nehru, the first Prime Minister of India ignited the inaugural lamp of this prestigious institution on 16th September, 1960. The sprawling land with the palatial building was donated by the former Maharaja of the princely state of Mysore, His Highness Sri Jayachamarajendra Wodeyar and the expert technical and logistic support was from World Health Organization (WHO). With the political, administrative and technical support, the institute formulated the National Tuberculosis Programme (NTP), based on the epidemiological, operational and sociological research studies carried out largely in the districts of Karnataka. Inspite of long years of implementation, the program could not come up to the expected levels of performance especially in the areas of case detection and cure rates. Hence, the Government of India and the Karnataka state Government decided to implement a Revised National Tuberculosis Control Programme (RNTCP) in the year 1993, initially on a pilot basis in 2.5 lakh population of Bangalore Mahanagara Palike (BMP) area, which was later scaled-up, to cover about 20 million in the state by the year 2001. The RNTCP has been able to cure more than 80% of new smear positive pulmonary TB patients with about 60% of estimated cases detected.

The State of Karnataka has the onerous task of extending the benefit of RNTCP to the rest of its population, both in the RNTCP unimplemented districts and also in the implemented districts. In the RNTCP unimplemented districts, expansion requires that all health care personnel are trained and the essential logistics are in place, before the implementation of RNTCP in the district. In the RNTCP implemented districts, the expansion is in terms of increase in cure rates to more than 85% and case detection rates to at least 70% of the new smear positive patients. In this regard, the institute was morally bound to provide maximum assistance to the people of Karnataka in their efforts to obtain the full benefit of RNTCP.

In addition, the institute has been engaged in operational research to bring in improvements in the performance of the programme. It has a well-developed bacteriology laboratory with ongoing internal and external quality assurance protocols for smear microscopy, culture & susceptibility tests, both conventional and rapid methods and an animal model research unit. Though the mandate of the institute extends to areas all over India, because of its geographical location and operational feasibility, its studies have mostly been conducted in districts of Karnataka.

The institute is also approached by various educational institutions for gaining orientation, skill based practical training, research projects for their technical staff and students. Another area which is most sought after is the assessment of anti-mycobacterial activity of various compounds synthesized by the researchers working in institutions situated mainly in Karnataka in their quest for identification of new drugs for shortening the duration of treatment for TB and for the management of Multi Drug Resistance TB (MDR TB) patients.

With these facilities being provided by the institute, it was felt necessary to present its various activities, specifically those aimed at benefiting people of Karnataka. This article presents result of assistance provided in various facets of TB control.

1 Identification of constraints in achieving the desired level of cure rates in RNTCP implemented districts of Karnataka.

2 Identification of constraints in achieving the expected case detection rates in RNTCP implemented districts of Karnataka.

3 Assistance in training the huge technical personnel...

* Laboratory Technician, National Tuberculosis Institute, No 8, Bellary Road, Bangalore - 560 003
1. Identification of constraints in achieving the desired level of cure rates in RNTCP implemented districts of Karnataka.

The institute conducted operations research for identification of reasons for low cure rates in the RNTCP district of BMP. The methods adopted was (i) Interview of all smear positive patients who were started on Category I and II (Cat-I and Cat-II) regimens in all Microscopy Centers (MCs) of BMP area, at their residences, both at the time of diagnosis and after declaration of treatment outcome to assess the quality of treatment observation. (ii) Scrutiny of laboratory registers, treatment cards and TB registers and (iii) Bacteriological examination, including culture and susceptibility tests done at NTI. In addition, the institute conducted a drug resistance surveillance study in Mysore District. The status of pulmonary TB patients put on treatment during the initial phases of RNTCP in BMP was also undertaken with a view to identify the constraints in both diagnosis and treatment.

It was found that the treatment default was the main reason for low cure rate in smear-positive patients put on both Category I and II (Cat-I and Cat-II). It was also noticed that the treatment-provider factors contributed more for the default than patient factors. The managerial aspects including non-identification of Directly Observed Treatment (DOT) providers who are acceptable and accessible to the patients, was another major finding. Studies on Initial Drug Resistance (IDR) also revealed that the IDR in BMP area was not a contributory factor for low cure rates among patients on Cat I regimen. On the contrary, the misclassification of patients as 'new' was to the tune of more than 15%, which had resulted in a significant number of treatment failures among these patients. Another finding was that defaults were more common among alcoholics and in males, whether they are on Cat I or II. In those on Cat II, patients categorized under 'Treatment After Default' (TAD), had a maximum number of defaulters. The initial MDR in Mysore was found to be low at 1.2%, indicating that this factor is not a significant contributory factor for failure to Cat I of RNTCP regimen. The treatment practices followed in the earlier phases of RNTCP showed that the addresses were not being recorded properly, DOT was not observed and drugs were mostly being issued to patients directly even during intensive phases of treatment.

2. Identification of constraints in achieving the expected case detection rates in RNTCP implemented districts of Karnataka.

The institute undertook a study to identify the reasons for low case detection rates, which were observed in BMP area. The NTI team visited 18 MCs of BMP and scrutinized the lab registers of all these MCs, interviewed the Medical Officers, Laboratory Technicians (LTs) of MCs and Senior TB Laboratory Supervisors (STLS) of the concerned TB Units, to obtain the data pertaining to number of cases registered from the MCs and their corresponding referring centers, including large hospitals and medical colleges.

The results of the exercise undertaken by the institute showed that the reference for sputum examination by most of the referring centers, particularly from major hospitals and medical colleges, was almost non-existent, resulting in low case detection rates in BMP.

3. Assistance in training the huge technical manpower required for expansion of RNTCP in unimplemented districts.

The institute had a detailed discussion with the State Tuberculosis Officer (STO) of Karnataka and chalked out the exact number of personnel required to be trained for expansion of RNTCP in the identified districts of Karnataka. A plan of action was developed to train RNTCP key personnel and State Level Institutions were identified. The District TB Officers (DTOs) and Medical Officers of TB Control (MO-TCs) underwent 12 days modular training, LTs for 10 days of both modular and practical training, Senior Treatment Supervisors (STS) for 10 days of modular and field training and STLS for 15 days of modular, practical and field training at NTI and RNTCP demonstration areas.

The institute took up the task of training DTOs (8), MO-TCs (28), LTs (146), STS (54) and STLS
(48) of Karnataka in the year 2002. This was done almost around the year, even during holidays in order to meet the deadline of implementation of RNTCP, which was agreed by State and Central Governments. NTI also assisted the STO in identifying a medical college for training LTs. Apart from these, NTI provided the assistance of a facilitator for training LTs at the STDC of Karnataka and hostel accommodation for trainees undergoing training at the STDC. A total of 284 Karnataka trainees underwent training during the year 2002 at NTI. In addition, the NTI fully supported the efforts of Karnataka state Acquired Immune Deficiency Syndrome (AIDS) prevention society in orienting the Medical Officers and health workers of Voluntary Counseling Testing Centers of all the districts of Karnataka. They were also given information on managing TB in HIV infected persons.


The NTI, Bangalore identified as the National Center for quality assurance for smear microscopy, prepares 50 blinded quality control slides for evaluation of each of the 8 STDCs every six months, including Karnataka. The proportion of positive and negative slides are changed in each round. These slides are read independently by each LT of the STDC. The results along with the slides are sent back to NTI within a month after receipt of the slides. A feedback on the quality of grading of the smears, is given to the STDC for taking corrective action, wherever required, including retraining.

NTI has so far conducted 9 rounds of quality assurance exercise in smear microscopy. The results showed that the concordance between the NTI Standard Readers and LTs of STDC was 84% in the 3rd round in 1999, which increased to 97-100% for four LTs in the 9th round in 2002.

5. Orientation of teachers of Medical colleges of Karnataka on RNTCP.

The institute, under the guidance of Central TB Division, conducted a national level workshop for professors of all Medical Colleges of India and three regional level workshops for teachers of all 21 Medical colleges of Karnataka, in order to sensitize the faculty and to ensure their total involvement in RNTCP.

The workshop for Medical College professors conducted in the year 2001, had called for speedy involvement of Medical Colleges in RNTCP. As a follow-up, three more workshops were conducted at NTI for 51 medical college teachers from the departments of TB and Chest, Community Medicine, General Medicine and Microbiology belonging to 20 medical colleges in Karnataka. The workshops were aimed at sensitizing these teachers on the technical basis of RNTCP and the role of medical colleges in RNTCP. The recommendations of all three workshops highlighted the need to associate the medical colleges in RNTCP and their willingness to be associated as microscopy and DOT centers under RNTCP. The teachers also chalked out a realistic time frame for their involvement. The STO of Karnataka and the representative of the Director of Medical Education of Government of Karnataka expressed their support for active involvement of all medical colleges, first in the implemented districts and later in all unimplemented districts even during the preparatory phase of RNTCP.

6. Research projects for MSc, PhD students and other researchers.

Due to its location in a state with a vast number of educational institutions, the institute is approached by faculty of these organizations for various research projects of their students/researchers. The institute adopts a methodology, wherein the researchers and the concerned faculty of NTI discuss and develop mutually acceptable protocols, with costing and identified roles for each institution. Wherever animal experiments are involved, the concurrence of the Animal Ethical Committee is obtained before starting the study. All those researchers requesting assessment of their compounds for anti-mycobacterial activity are made to review the results of RNTCP treatment outcomes, before they plan their protocols. The information that the present Short Course Chemotherapy (SCC) regimens are capable of curing more than 85% of new smear positive patients is made known to them.

The Strategic location of the institute in Bangalore which is the hub of vast number of education organizations is of immense significance. Students and researchers of these institutions approach the institute for undertaking research project/short term studies, training in TB bacteriology. The collaborative areas are:

1. Standardization of simulated specimen for grading under RNTCP.
2. Objective assessment of grading of smears
under RNTCP.

3. Culture status of patients with all three smear negative results.

4. The institute is offering assistance to Ph. D students of Bangalore, Mysore, Mangalore Universities and research foundation in Bangalore in Karnataka for assessing the anti-mycobacterial activity of the compounds developed by them. The compound showing positive results will be subjected to pharmacodynamic and pharmacokinetic studies in their respective institutions.

5. Studies involving animal experiments, such as ‘Screening two novel M.tuberculosis proteins for human T-cells response and testing DNA expressing the two proteins in guinea pigs for protection against ‘TB’ is being conducted in collaboration with Center for Genetic Engineering, Indian Institute of Science, Bangalore. The objective of this research activity is to test DNA vaccines in Guinea pig models.

6. The rapid culture facility using MB-BacT 240 System is being presently offered free to extra-pulmonary patients referred by two institutions of Bangalore namely SDS sanatorium and St. Martha’s Hospital Bangalore. Objective of this study is to compare and evaluate mycobacterial isolation rate of extra-pulmonary specimens by MB/Bact with that of conventional method of processing culture. From our earlier studies the contamination rates have been found to be 1% by rapid technique and 6% by conventional method and the system is able to give early results i.e. within 4 weeks compared to 8 weeks by conventional method.5

CONCLUSIONS

The various efforts/studies have offered certain viable solutions to many of the constraints faced in managing the patients of Karnataka under RNTCP. Making DOT more convenient to all patients may be one solution for the problem of ‘default’ by identifying suitable DOT providers. Efforts taken to reduce ‘defaults’ among Cat I patients may pay dividends in reducing treatment after default cases and thereby reducing ‘defaults’ among Cat II patients.

Sensitization of teachers of medical colleges has motivated them to be active partners in the efforts of governments to tackle the problem of TB in Karnataka. It is also likely to increase the case detection rates to a considerable extent and increase the confidence of the public as well as private practitioners on the RNTCP regimens.

The preparatory activities for implementation of RNTCP in nine districts of RNTCP received a boost from NTI in the form of the training of large number of DTOs, MO-TCs, LTs, STS and STLS conducted at NTI. NTI would also assess their other preparatory activities during the RNTCP appraisal visits to various districts of Karnataka.

The quality assurance network activity of NTI has resulted in an increase in the concordance of results of LTs of STDC, Karnataka making them suitable to undertake quality assurance of their DTCs.

The scientific rationale and techniques of RNTCP are being imparted to the M.Sc. students of Karnataka through their Projects. This would go a long way in spreading the knowledge of RNTCP, so as to popularize it among all teaching institutions of Karnataka.

The facilities are provided for assessing antimycobacterial activity of compounds developed by many researches only after they have understood the strength of RNTCP regimens. They realize that their efforts are for developing drugs for small percentage of patients who had become MDR patients due to wrong treatment practices of physicians.

The institute will continue to support the people and government of Karnataka in all their endeavors for containing this dreaded disease.

REFERENCES:

1. www.tbcindia.org/perfor.asp


3. Sophia Vijay, Balasangameshwara VH, Jagannatha PS, Saroja VN & Kumar P: Defaults Among Tuberculosis Patients
