Management of tuberculosis: From drug treatment to control program

Tuberculosis (TB) is an ongoing epidemic spanning over several centuries. It is the leading cause of death and morbidity globally, with approximately 9.4 million incident cases and 1.3 million deaths annually.[1] This curable and preventable communicable disease is the seventh leading cause of death worldwide. However, the disease is concentrated in the developing world and 80% of all cases occur in 22 highest-burden countries; South-East Asian region has the highest TB burden, contributing 35% to the global TB incidence.[2] India has the distinction of having more people with TB than any other country, accounting for one-fifth (21%) of the global incidence.[3] The incidence of New Sputum-Positive (NSP) cases is about 75 cases per 100,000 population.[4] Treatment of each sputum-positive case is extremely important, as each sputum-positive case infects 10-15 people every year. India’s TB troubles are further compounded by increasing HIV-infected population (2.5 million).[5] Besides, drug resistance has also added to the magnitude of the problem, as there is lack of drug susceptibility testing and second-line drugs are expensive and also difficult to tolerate.

In this issue, Dr Jyotsna Joshi has contributed a review covering various facets of drug therapy of TB. Almost all relevant aspects including important adverse effects of drugs are highlighted, which will be useful for the readers. The hallmark of the article is the message that the key to elimination of TB is the optimum treatment, which reduces transmission of drug-resistant TB.[6]

Drug resistance to anti-TB therapy is a global problem, and this was recognised soon after the first anti-TB drug—streptomycin—was used as monotherapy. Although we have several potent anti-TB drugs available now, the rate of drug resistance is not reducing significantly.[7] The major reasons for the development of drug resistance include non-adherence to the prescribed treatment, inadequate doses, deficient regimens with insufficient drugs, poor absorption, and laxity in monitoring the regimens. That is why drug-resistant TB is called a “man-made problem”. The rise in drug-resistant TB is a manifestation of serious underlying problems in the health infrastructure. The highest priority in managing drug resistance must include adherence to treatment and high rates of cure. All these deficiencies can be addressed through a well-organized and implemented tuberculosis control program. If all patients with TB are efficiently treated, then transmission of disease would stop leading to ‘control’. This is the theme behind revised national tuberculosis control program (RNTCP).

There have been efforts on part of Government of India to control TB through a national program. The national tuberculosis program (NTP) came to existence in the year 1962; however, the program was able to achieve the case detection of only 30%, of which 30% were cured. This rate was well below the expectation; hence, it failed to control the disease.[8,9] Distinctly, the need for a better program was realized, focusing on better case detection rates and adherence to treatment regimen. India has the credit of conducting “Home-Sanatorium study”, which revolutionized the whole concept of TB management and forms the conceptual basis of directly observed therapy, short course (DOTS) in the year 1956.[8,9] DOTS was implemented via RNTCP 1997,[10] and by March 2006, a full nationwide coverage was achieved.[11] The objectives of RNTCP are to cure at least 85% of NSP TB patients registered and after achieving this objective, detecting at least 70% of existing cases in the community.[12]

As would be expected, numerous problems arose at the operational level. The quality of sputum microscopy, supervision, and methods of drug delivery are the most important features for the success of the program. India is a diverse country with various cultures and extremely remote areas where communication is difficult. It is expected that in far-flung areas, there would be some lacunae in the level of care provided to patients. The study in the issue by Gupta et al. has presented the evaluation of RNTCP in Kangra district of Himachal Pradesh.[13] This is an important study evaluating the success of RNTCP in remote areas. It has shown that even in hilly terrain and difficult areas, despite operational difficulties, the program was successful in achieving its goals as per targets set by RNTCP. However, despite achieving national targets, several deficiencies were noticed. Such gaps in the level of care compromise success of the program, leading to faulty diagnosis and undertreatment. There is a need for better supervision by the senior staff for maintaining consistency and further achieving the targets set for the year 2011. Training and updating is required to fill the gaps in the knowledge of health staff so that they are well prepared to provide optimum treatment. At the same time, information, education and communication (IEC) needs to be intensified, especially for people living in rural areas as well as women. There is a need for stronger political commitment to fill the vacancies for smooth functioning of the program. The major impediment to success of RNTCP is operational and a system of monitoring the same at district level is indispensable.
This study is overall a good analysis because both quantitative and qualitative analyses (semi-structured questionnaires) have been performed. Before starting the study, opinion, suggestions, and consensus was generated regarding the evaluation protocol involving all stakeholders. At the same time, the study is too simplified in the sense that it generated no data on burning issues under RNTCP, such as relapses and defaults, as well as multidrug-resistant TB. There was no follow-up of the cured patients; hence, no data are available on relapses. The TB units in which the study was done were selected because they were performing satisfactorily. Hence, it is not certain that these results can be extrapolated to other difficult areas.

The study raises an interesting issue of rise in the extrapulmonary tuberculosis (EPTB) cases. There are no details of sites involved or demographic data for EPTB cases. Other studies reported lymph node to be the most common extrapulmonary site involved.[14] One of the most important associations observed was HIV-TB co-infection, though this is not as strongly associated in Asian patients as it is with Africans.[15,16] The present study did not undertake HIV serology; hence, it is difficult to understand the cause of rise in EPTB without further data. Poverty and undernutrition may be other associated factors. The rise in EPTB cases also raises the need to equip tuberculosis units with knowledge of proper treatment of such patients, which are difficult to treat at times with the six-month regimen.

This year, with further intensification of RNTCP with vision of “TB free India”, there is a greater need to address all aspects of TB control from the grassroots to the top. It is known that drug resistance levels are higher in areas with poorly performing TB control programs. With further extension of DOTS-Plus and revision of existing regimens as per World Health Organization (WHO) recommendations, prevention as well as management of drug resistance seems to be feasible. Successful implementation of RNTCP in India can save lives, but this will require active participation of patients, the community, the healthcare providers, and the policy makers. With the Tribal action plan in place, it will be possible to extend the benefits to distant and difficult areas as well.[11] Monitoring and training system needs to be strengthened to correct the deficiency in knowledge and implementation of the staff regularly, and hence improve delivery of services. Finally, these marginalized areas need strong political and operational commitment to fill vacancies and closely set up DOTS centers to improve access to the services. The RNTCP program must be evaluated frequently, with special attention toward relapses and drug-resistant TB. A follow-up for at least one year is needed, as most relapses occur in the first year, after the completion of anti-tubercular therapy. As the program moves from the preparatory and expansion phase to the maintenance and consolidation phase, the RNTCP should endeavor to continue providing high-quality and cost-effective TB diagnostic and treatment services. In order to further improve the quality of services, earlier strategies have to be fine-tuned and strengthened, and several new initiatives are needed.

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