



A prospective study on tuberculosis and its eradication in India

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Abstract

Tuberculosis is a dangerous infection caused by the bacterium *Mycobacterium tuberculosis*, which primarily attacks the lungs. It is India's one of the most serious public health issue. In India, Multi Drug Resistance has grown to embrace the most dangerous form, TDR-TB. Co-infection of TB and HIV is also one of the issues. Current WHO report documents the sustained reduction in deaths due to TB achieved by India through continuous efforts by launch and implement different TB programme like NTCP, RNTCP, NTEP since independence. In order to eliminate tuberculosis in India by 2025, the Government of India launched the National Strategic Plan NTEP. It has four strategic pillars: detect, treat, prevent, and build (DTPB). India has huge reservoir of latent TB infection which need to tackled seriously. Novel initiatives along with NTEP such as the Ni-Kshay Poshan Yojana (NPY) BPaL regimen for MDR TB, EDNS supplementation, and adult BCG immunization appear to provide the hope to achieve our TB eradication target. Recently WHO praise and acknowledged India for tested and put 25.1 lakh people on treatment in 2023.

Keywords: Tuberculosis, RNTCP, NTEP, MDR-TB, TB eradication

Introduction

Tuberculosis, also known as TB, is a fatal condition that mostly affects the lungs and is caused by the bacterium *Mycobacterium tuberculosis*. Tuberculosis is one of India's most serious public health challenges. The World Health Organization (WHO) says that India has the world's highest tuberculosis pandemic [1]. Tuberculosis can spread when an infected person coughs or sneezes, releasing tiny droplets carrying germs into the surrounding air, causing droplet infection to healthy people. A person can unknowingly acquire this bacterium during inspiration and have it lie dormant within them, a condition known as inactive tuberculosis (latent phase). Tuberculosis disease is developed. When bacteria begin to grow and symptoms appear. Although tuberculosis germs can infect any organ in the body (such as the kidney, lymph nodes, bones, and joints), the disease most usually affects the lungs [2]. Approximately 80% of all tuberculosis cases involve the lungs. In India, some forms of the TB bacteria have become drug resistant and causing Multi Drug Resistance TB (MDR-TB). TDR-TB (Total Drug Resistance TB) began with MDR-TB, progressed to XDR-TB, and has since expanded to include the most dangerous variant, TDR-TB [3].⁴⁾ India carries a disproportionately heavy burden of the global tuberculosis rates [5].

Estimated TB Burden in India

In 2023, it is anticipated that approximately 28 lakh persons in India will be newly infected with tuberculosis. It is estimated that 3,23,200 deaths occurred due to TB in India during year 2023 means that 37 citizens die due to TB every one hour in India [6]. It was also estimated that Approximately 2% of TB patients estimated to be HIV positive. Multi-drug resistance in tuberculosis was reported to be 2.5% in new cases and 13% in previously treated cases (Global TB Report 2023).

History of TB and its control in India

Tuberculosis described in ancient text Sushruta in 606 BCE [7]. India's reaction against tuberculosis (TB) has altered

throughout time, as technology has advanced. Responses to it have evolved throughout time, beginning with pre-independence and continuing through the current WHO-assisted period [8]. Historically, treatment procedures in the public sector in India had some limitations [9]. However, TB healthcare services in India's public sector have recently improved significantly. The National TB Elimination Programme (NTEP) in India has expanded its scope to include free diagnostic and treatment services for both drug-sensitive and drug-resistant tuberculosis. The effort is now focusing on TB preventive therapy in disadvantaged groups with TB infection, who are more prone to progress to active TB disease.

Some remarkable steps during the journey of TB control in India is as below. Prior to independence, India created its first tuberculosis sanatorium in 1906 in Tiluania, near Ajmer in Rajasthan. The first TB medical dispensary opened in 1917. By 1925, X-rays could be used to diagnose tuberculosis. Post-independence, the Indian government began numerous regional and national programs to reduce the number of TB patients in India [10]. In 1947, the Director General of Health Services formed a TB Division to treat the disease, and a BCG vaccine production centre was built and nationwide BCG campaign launched in 1951. In 1956 Tuberculosis Research Centre (TRC) was established in Chennai. The National Tuberculosis Institute (NTI) in Bangalore was established in 1959. In 1961 1st Model District Tuberculosis Centre (DTC), Anantapur district, Andhra Pradesh to put into effect. In 1962 National Tuberculosis Programme (NTP) launched. In this way the period 1961-1986 was continued as the Era of conventional chemotherapy. Further the time period 1986-1993 was proved as Era of short course chemotherapy. However, in 1992, it was decided that NTP had failed to restrict the spread of tuberculosis because the diagnostic and treatment rates were only 30%. [11]. In 1993 Directly Observed Treatment Short Course (DOTS) using intermittent regimen tested and in 1997 Revised National Tuberculosis Control Programme (RNTCP) was launched. Currently since 2019

National Tuberculosis Elimination Programme (NTEP) being run to combat with the tuberculosis. NTEP was primarily concerned with tuberculosis prevention through the use of BCG vaccines and domiciliary TB therapy. RNTCP implemented the internationally approved Directly Observed Treatment Short Course (DOTS). Smear microscopy was implemented in RNTCP for early diagnosis in a decentralized manner, as well as to strengthen TB medicine supply [12]. Since its inception, it has aimed to improve impoverished people's access to TB care [13]. The program's goals were to detect at least 70% of cases and keep the cure rate at least 85% for new smear positive patients. Strategic combined TB/HIV collaboration efforts are also carried out, in which all TB patients are offered HIV testing as well as ART (antiretroviral medication), Community Care Centres for HIV-TB co-infected patients, and referring to NACP (National AIDS Control Programme) for HIV care and support. In order to eliminate tuberculosis in India by 2025, the Government of India launched the National Strategic Plan Phase II (2017-2025) of the RNTCP, which was renamed the National Tuberculosis Elimination Programme (NTEP) on January 1, 2020. NTEP has four strategic pillars: detect, treat, prevent, and build (DTPB) [14]. NTEP is focusing on active case detection, notification of all TB cases from both the public and private sectors, and early diagnosis and treatment. Nikshya Poshan Yojana provides patient assistance, as do ICT-based therapy adherence programs.

India's progress in tackling Tuberculosis and Achievements

The World Health Organization (WHO) released the Global Tuberculosis Report 2024 on October 29, 2024 [15]. The report praised India's great success in decreasing the gap in missed tuberculosis cases since 2015. In 2023, India was expected to have 27 lakh tuberculosis cases, with 25.1 lakh people diagnosed and receiving treatment. This has increased India's treatment coverage to 89 percent in 2023, up from 72 percent in 2015, bridging the gap of missing cases. WHO accepted a drop in India's tuberculosis incidence, from 237 per lakh population in 2015 to 195 per lakh population in 2023, accounting for a 17.7% decline, which is more than double the rate of decline compared to the global decline of 8.3%. Also, the current report documents the sustained reduction in deaths due to TB achieved by India from 28 per lakh population to 22 per lakh population, a 21.4% decline.

The WHO report notes that a majority of the funding of the TB programme comes from government resources. This is also accepted that in October 2024, the Indian government announced an increase in funding under the Ni-Kshay Poshan Yojana (NPY) from the existing Rs. 500 per month/patient to Rs. 1,000/month/patient for entire duration of the treatment. Introduction of Energy Dense Nutritional Supplementation (EDNS) would cover approximately 12 lakh under-nourished TB patients (BMI less than 18.5 kg/m² at the time of diagnosis). EDNS would be supplied to all eligible patients throughout the first two months of treatment. The Union Ministry of Health & Family Welfare approved the implementation of the BPALM regimen, a novel treatment for Multi-Drug-Resistant Tuberculosis (MDR-TB), as a highly effective and shorter treatment alternative under its National TB Elimination Program

(NTEP) in September 2024. The private sector notification rate has increased by 33%, and as a result, the program has been able to attain a treatment success rate of 87.6% in 2024 (Jan-Sept). Beside this adult BCG vaccination has been started since 10th Jan 2024 and more than 81.4 lakh vaccination doses have been given. [15]

Conclusion

Recently, WHO appreciated and congratulated India for testing and putting 25.1 lakh patients on treatment by 2023. India has come a long way in controlling TB, yet it still has the world's highest burden of TB and MDR-TB. Through the programmes and strategies described above, our efforts have not been in vain as National Tuberculosis Eradication Programme is proved in Strengthening quality of care and treatment. Private sector is need to be addressed all the way urgently because TB patients first approach the private sector with his symptoms, so Pvt sector must be strengthening for case detection. Novel initiatives along with NTEP such as the Ni-Kshay Poshan Yojana (NPY) BPAL regimen for MDR TB, EDNS supplementation, and adult BCG immunization appear to provide the hope to achieve our TB eradication target. India has huge reservoir of latent TB infection which should be tackled seriously. In spite of lots efforts, Challenges still remains in reaching the unreached & management of TB in hard to reach areas, urban slums, Migrants, etc. So, its today's need that we the people of India have to come together for India's fight to eliminate TB.

References

1. WHO, Global tuberculosis control. WHO report. WHO/HTM/TB/ Geneva: World Health Organization, 2006, 362.
2. Tuberculosis - Causes, Symptoms, Treatment, Diagnosis. C-Health, Retrieved, 2013.
3. Udwardia Z, Vendoti D. Totally drug-resistant tuberculosis TDR, TB, in India: every dark cloud has a silver lining. *Journal of Epidemiology and Community Health*, 2013;67(6):471-472.
4. Loewenberg S. India reports cases of totally drug resistant tuberculosis. *The Lancet*, 2012;379(9812):205.
5. TB Statistics for India. TB, Facts, 2012. Retrieved, 2013. from <http://www.tbfacts.org/tb-statistics-india.html>
6. WHO, Global tuberculosis report Geneva: World Health Organization, 2024. Licence: CC BY-NC-SA IGO, 2024, 3, 0.
7. Sushruta Samhita. https://en.wikipedia.org/wiki/Sushruta_Samhita (last accessed on, 2020, 20, 10).
8. Sandhu GK, Tuberculosis: current situation, challenges and overview of its control programs in India. *Journal of Global Infectious Diseases*, 2011;3(2):143-150.
9. Mishra G, Ghorpade SV, Mulani J. XDR, TB, An outcome of programmatic management of TB in India. *Indian Journal of Medical Ethics*, 2014;11(1):47-52.
10. Sandhu GK, Tuberculosis: Current situation, challenges and overview of its control programs in India. *Journal of Global Infectious Diseases*, 2011;3(2):143-150.
11. Agarwal SP, Vijay S, Kumar P, Chauhan LS, The history of Tuberculosis Control in India: Glimpses through decades. In: Agarwal SP, Chauhan LS, editors. *Tuberculosis Control in India*. New Delhi, India:

- Directorate General of Health Services, Ministry of Health and Family Welfare, 2005, 15–22.
12. Sachdeva KS, Kumar A, Dewan P, Kumar A, Satyanarayana S. New Vision for Revised National Tuberculosis Control Programme RNTCP Universal access - "Reaching the un-reached". *Indian Journal of Medical Research*, 2012;135(5):690–694.
 13. Sachdeva KS, Kumar A, Dewan P, Kumar A, Satyanarayana S. New vision for Revised National Tuberculosis Control Programme RNTCP Universal access reaching the un-reached. *Indian Journal of Medical Research*, 2012;135(5):690–694.
 14. Revised National Tuberculosis Control Programme. <https://www.nhp.gov.in/revised-national-tuberculosis-control-programme> last accessed on 2020, 20, 10.
 15. WHO. World TB Report Geneva: World Health Organization, Published, 2024.