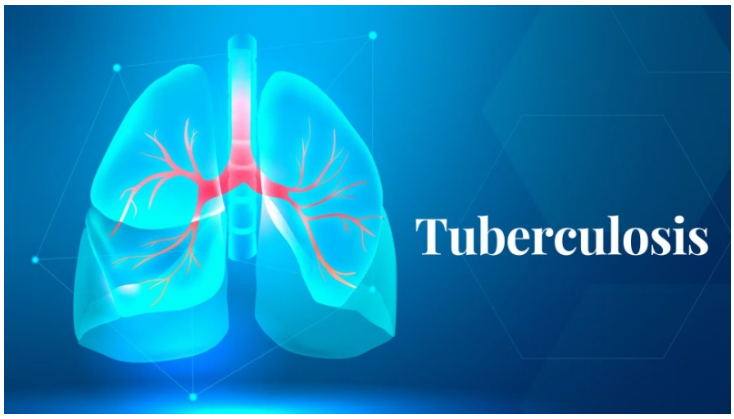
BioSpectrum the business of Bio & Health Sciences

Effectively Eliminating Drug-resistant TB

01 March 2024 | Views | By Ayesha Siddiqui

India's fight against tuberculosis (TB) has made significant strides, earning recognition from the World Health Organization (WHO). With less than two years left to achieve its 2025 TB elimination target, the country must embrace new strategies. Let’s look at how far the country has progressed in its elimination programme and what still remains to be done.



India has the highest burden of TB, with two deaths occurring every three minutes from the disease. The country recorded a staggering 28 lakh cases in 2022, accounting for 27 per cent of the global cases, according to WHO.

India initiated the TB Free India campaign with the ambitious goal of eradicating TB by 2025, a milestone set five years earlier than the target outlined by the UN's Sustainable Development Goals. Despite facing setbacks due to COVID-19, the nation doubled down on its efforts, resulting in notable progress. The India TB Report 2023 heralded 2022 as a pivotal year in TB surveillance, noting a significant achievement with a record-high notification of 24.2 lakh TB cases, representing an increase of over 13 per cent compared to 2021.

The latest WHO Global TB Report 2023 acknowledged and praised India's efforts in its fight against TB, particularly highlighting the effectiveness of its case detection strategies. The report emphasised that India's intensified case detection strategies led to the highest-ever notification of cases in 2022, surpassing pre-COVID levels. The government's key initiatives, such as specialised active case finding drives, the scaling up of molecular diagnostics to block levels, decentralisation of screening services through Ayushman Bharat Health and Wellness Centres, and private sector engagement, have significantly reduced the gap in missing cases.

Road to elimination

While the country has made remarkable progress in its fight against TB, the adoption of additional strategies such as shorter treatment regimens, the development of vaccines, and a renewed focus on nutrition could prove to be game-changers in its goal of eliminating TB for good.

The BPaL regimen, composed of Bedaquiline, Pretomanid and Linezolid, presents a promising alternative for a shorter, safer and more tolerable treatment option for drug-resistant tuberculosis (DR-TB). Lasting only 26 weeks, it contrasts sharply with conventional DR-TB treatments, which can span 18 to 21 months and entail the consumption of over 4,000 to 5,000 tablets.

Endorsed by the US FDA (United States Food and Drug Administration) in 2019 and the WHO in 2022, the BPaL regimen has been implemented in more than 70 countries, including South Africa, Ukraine, Indonesia, the Philippines and Vietnam.

“The older, conventional regimen for drug-resistant TB included prolonged use of injections with other drugs. This was associated with increased incidence of adverse drug reactions (ADRs), implementation challenges under the programme and inconvenience to the patients. The new TB drug regimen uses the newer oral drugs like Bedaquiline, Delamanid or Pretomanid, or the repurposed drugs such as linezolid, clofazimine, etc. These regimens are injection free and have lesser pill burden leading to more acceptance among the TB patients besides reducing the implementation challenges due to the use of injections. They have the ability to kill the actively multiplying drug-resistant TB bacteria faster and a sustained killing of the bacteria to prevent the recurrence of the TB disease among the patients. These regimens have shown improved treatment success rates under field conditions under the national programme,” said **Dr Rupak Singla, Head of Department, National Institute of TB & Respiratory Diseases, New Delhi**.

Dr Singla further said “To combat the adverse drug reactions of these regimen, specially due to drug linezolid, various regimens using different dosages and durations of linezolid have demonstrated reduced incidence of ADRs maintaining the efficacy of the regimen. Hence, these newer treatment drug regimens could reduce the global burden of drug-resistant TB. However, the requirement of a good quality laboratory network, availability and higher cost of the drugs continue to pose a challenge.”

The new regimen is shorter, easier on patients and improves treatment adherence, resulting in better outcomes compared to previous drug regimens.

Talking about the potential implications of the new TB drug regimen on India’s TB control efforts, Dr Singla stated, “The cure rate for previous conventional TB regimen for multidrug resistant TB (MDR-TB) was to the tune of around 50 per cent and for Extensively drug-resistant-TB (XDR-TB), less than 30 per cent. The new TB drug regimen has the potential for significant improvement in treatment success rates for MDR-TB as well as XDR-TB.”

In India the national data shows that more than 36,000 drug-resistant TB patients have been initiated on shorter oral Bedaquiline-containing regimen and more than 92,000 patients have been initiated on longer oral regimen till date. Treatment success rates of shorter oral regimen for the cohort April-September 2022 (around 12,000 patients) is 69 per cent and of longer oral regimen for the cohort January-September 2021 (around 15,000 patients) is 71 per cent. The improved success rates of new drug regimens is likely to translate into less number of deaths due to TB, reduced period of infectiousness of TB patients and reduced transmission of TB to others in the community leading to reduced incidence of TB.

Studies at the 2023 Union World Conference on Lung Health affirm WHO-endorsed regimens' effectiveness, surpassing traditional 18- to 24-month treatments. The goal is to urge high-burden DR-TB countries to update guidelines and offer shorter treatments to all patients in need. Only 40 per cent of the 410,000 people with DR-TB in 2022 had access to the shorter regimen, as per a WHO report.

A group of experts in the country have stressed the need for introducing the BPaL regimen in the TB control programme of the country. B**lessina Kumar, CEO, Global Coalition of TB Advocates, New Delhi** emphasised the potential cost savings associated with its adoption, citing studies estimating a global annual savings of $740 million. With India accounting for a significant portion of global multi-drug, rifampicin-resistant (MDR/RR-TB) treated patients, she suggested that the country could save nearly $250 million per year through the implementation of this regimen. India will likely roll out the new regime soon.

TB Vaccine

Vaccination holds promise as a game-changer for TB elimination. The Indian Council of Medical Research (ICMR) is conducting phase III trials to evaluate the efficacy and safety of two vaccines: VPM1002 and MIP (Mycobacterium indicus pranii). VPM1002 is a live vaccine based on recombinant BCG, modified for better safety and efficacy. MIP or Immuvac, originally developed for leprosy, is a whole-cell TB vaccine candidate. The trial aims to assess the effectiveness of these vaccines in preventing TB disease, among 12,721 individuals exposed to TB at home (referred to as household contacts). Enrollment for the study is complete, with participant follow-up currently ongoing, according to the pipeline report 2022 by the Treatment Action Group.

Bharat Biotech is partnering with the Spanish firm BIOFABRI to develop, manufacture, and distribute a new tuberculosis vaccine across over 70 countries in Southeast Asia and sub-Saharan Africa. The TB vaccine candidate by Bharat Biotech is set to enter phase-III trials soon.

A Lancet study highlighted the pivotal role of nutrition in TB management. The Reducing Activation of Tuberculosis by Improvement of Nutritional Status (RATIONS) trial demonstrated that providing food baskets to TB patients and their households reduced all forms of TB by nearly 40 per cent and infectious TB by almost 50 per cent. In 2018, the Indian government launched the 'Nikshay Poshan Yojana,' a direct benefit transfer (DBT) scheme to offer nutrition support to TB patients. Since its inception, the scheme has disbursed approximately Rs 2613 crore to over 95 lakh TB patients.

India has indeed made significant strides in addressing TB; however, the battle against the disease is far from over. Despite enhanced detection and surveillance efforts, there's a need to adopt newer strategies to combat TB effectively. Advances in R&D of vaccines, access to newer drug regimens, enhanced focus on nutrition will all help in propelling TB elimination goals.

Ayesha Siddiqui