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## **CHILDHOOD TUBERCULOSIS IN SRI LANKA**

### ***Introduction***

Tuberculosis (TB) is an infectious disease caused by the bacillus – *Mycobacterium tuberculosis* (MTB). Tuberculosis commonly affects the lungs (pulmonary TB) but can affect any other organ in the body (Extrapulmonary TB). It is an airborne infection. Poverty, overcrowding and poor living conditions are contributing to the increased transmission of TB. Due to the immaturity of the immune system, children are at higher risk of progressing to active disease than adults and developing complicated forms such as TB meningitis and miliary TB. A total of 1.6 million people died from TB in 2021. Worldwide, TB is the 13th leading cause of death and the second leading infectious killer after COVID-19. In 2021, an estimated 10.6 million people fell ill with TB worldwide. Six million men, 3.4 million women and 1.2 million children [1]. Sri Lanka is considered as a middle burden country for Tuberculosis. There are around 8500 to 9500 cases of TB detected each year. Out of this, childhood TB cases ranged from 250 to 350 which were around 3 % of the total case burden of the country.

### ***Goal***

The overall medium-term goal for TB control is to reduce morbidity, mortality and transmission of TB until it is no longer a public health problem in the country. Therefore, the main goal of this article is focused on provide an overall outlook on Pediatric Tuberculosis and evaluate how Republic of Sri Lanka handles this challenge. In this article we discuss occurrence statistics of Tuberculosis in Sri Lanka as well as its diagnosis, management and preventive criteria.

### ***Material and methods of research***

The global level statistics and percentages were referred from the World Health Organization (WHO) official website. The statistical data related to Sri Lanka were taken from the Sri Lankan College of Pediatricians official website (slcp.lk), Annual Epidemiological Report 2021 published by Ministry of Health and The National Programme for Tuberculosis Control and Chest Diseases (NPTCCD) database. The other related data were taken from PubMed publications and other resources (see References below).

### ***The results of the research and their discussion***

According to the recent estimates, there were 10.6 million peoples with active TB around the globe in 2021 [1]. Out of this, 1 million (10 %) were children below 15 years of age. Both girls and boys were almost equally affected. There were an estimated 1.3 million deaths among HIV negative TB patients in 2021. Out of the total deaths, 15 % were among children with TB. HIV has a great impact on the survival of children with TB. Children accounted for 10 % of the total deaths among HIV-TB co-infected patients. In countries with a high burden, children account for around 25–40 % of the new cases and in low burden countries, it is around 4–7 %. But the actual caseload may be much higher than this.

In Sri Lanka in 2021, 250 child TB cases were reported to the central unit of National Program for Tuberculosis Control and Chest Diseases (NPTCCD) out of which 101 patients were below 5 years of age and 149 cases belong to the 5–15 age group. There was an almost similar number of girls and boys in the below 5 years age group. But female TB patients were more in the age group of 5–15 years in 2021. There is a district variation of childhood TB cases. It varies from 0–5 % in 2021. Not a single case of TB below 15 years was detected in Polonnaruwa & Kilinochchi Districts. The detection of child TB cases was very low in districts such as Colombo (3,5 %), Gampaha (1,5 %), Kalutara (2,3 %), Ratnapura (2,5 %) and Galle (0,7 %) even though overall TB burden is high. Only Kandy and Matale districts had shown adequate detection of paediatric cases with over 5% case burden. When considering the site of TB, the majority of cases were with extrapulmonary TB (EPTB). The commonest form of EPTB among children was TB lymphadenitis. Among pulmonary TB cases, the majority were clinically diagnosed cases of TB. Severe forms of TB such as TB meningitis among children were very low.

Diagnosis of TB in children is often difficult as many small children cannot produce sputum for examination. A detailed history, examination and contact with a known or likely case of tuberculosis are preceded for diagnostic tests. In infants, the presentation may be more acute or persistent and they can have non-resolving symptoms when compared to older children. Adolescents usually present with symptoms similar to those in adults. The diagnosis is based on:

- A detailed history (including a contact history of TB and symptoms consistent with TB).
- Clinical examination (including growth assessment).
- Investigations:
  - Tuberculin skin testing.
  - Chest X-ray and other relevant radiological investigations.
  - Bacteriological confirmation including Xpert MTB/RIF (whenever possible).
  - Investigations for extra-pulmonary TB.
  - HIV testing.

All child-contacts are screened clinically (history and examination) [2]. Children aged 0–4 years (regardless of symptoms) and children aged 5 years and above who are symptomatic, are further evaluated for TB. Children of all ages living with HIV, who have been in close contact with a TB case are evaluated for TB. When a child is diagnosed with TB, efforts are made to detect the source case (if not already identified) and any other undiagnosed cases in the household. Source cases include, the household members, neighbors in crowded areas, frequent visitors, servants, school bus drivers, staff in day-care centers, nurseries etc. If a child presents with TB, other child contacts are sought and screened, as for the source case. Children are regarded as infectious if they have sputum smear-positive pulmonary TB or cavitary TB on chest X-ray (not uncommon in older children and adolescents). Sputum smear microscopy is among the least expensive methods of diagnosing infectious cases of pulmonary tuberculosis in Sri Lanka. Whenever tuberculosis is suspected, three sputum samples are collected and examined microscopically for acid fast bacilli (AFB). Among younger children, sputum smears can be negative due to the paucibacillary nature of the disease and difficulty in obtaining the sputum sample [3].

The modern treatment strategy is based on standardized short course chemotherapy regimens and proper case management to ensure completion of treatment and cure. Treatment outcomes in children are generally good even in the face of coinfection with HIV, provided the treatment is started promptly. Children generally tolerate anti-TB drugs better than adults. Children, their parents, family members and other caregivers are intensively educated about TB and the importance of completing the full course of treatment. Their support is vital to ensure

a satisfactory treatment outcome. The treatment regime has two phases, an Intensive Phase (IP) and a Continuation Phase (CP). The first line drugs used are: Isoniazid (H), Rifampicin (R), Pyrazinamide (Z), Ethambutol (E).

Severe malnutrition is associated with increased mortality in TB patients in Sri Lanka. Child's nutritional status should be assessed and supported regularly during treatment of TB. Breastfeeding should be continued and adequate intake of food should be ensured. Additional energy is particularly important during the intensive phase of treatment and is best given through additional household foods, based on locally available and affordable foods as part of a balanced varied diet. 'Thripasha' (A dietary supplement provided free of charge by Sri Lankan government) is usually given as a supplementation. Infants under 6 months of age with growth failure require referral to a therapeutic feeding program. If this is not available or feasible, breastfeeding mothers should be given support to optimize breastfeeding. Nutritional supplementation cannot be given directly to an infant under 6 months of age but can be provided for the lactating mother.

In Sri Lanka, the BCG (Bacille Calmette-Guérin) vaccine is given to all babies including low-birthweight babies at birth or before discharge from hospital and the vaccination coverage is around 99 %. It is a live attenuated vaccine made from *Mycobacterium bovis*. It protects young children against developing complications of 'Primary infection', such as TB meningitis and miliary TB [4]. However, it has no impact on the transmission of TB in the community as it does not confer protection against the development of 'post-primary disease'.

### ***Conclusion***

Even though South east Asia region of the world considered to be the high burden region for TB, Sri Lanka can reasonably consider as a middle burdened country based on the statistical data. The reason for that is Sri Lanka's successful criteria of diagnosis, management and prevention of TB. Based on the statistic and data discussed above and previously published scholarly articles, we can see that as a developing country, Sri Lanka's efforts against TB is remarkable.

### **LITERATURE**

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