



## CLINICAL COURSE OF TUBERCULOSIS IN CHILDREN AT THE PRESENT STAGE

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### ABSTRACT

*Tuberculosis (TB) remains one of the leading infectious diseases worldwide and continues to pose a significant threat to child health. Despite advances in diagnostics, vaccination, and treatment, pediatric tuberculosis remains a major public health concern, especially in low- and middle-income countries. The clinical course of tuberculosis in children differs significantly from that in adults due to age-related immunological characteristics, difficulties in diagnosis, and a higher risk of severe disseminated forms. The aim of this study is to analyze the current features of the clinical course of tuberculosis in children based on contemporary scientific literature.*

### Introduction

Tuberculosis is a chronic infectious disease caused by *Mycobacterium tuberculosis*. According to the World Health Organization, tuberculosis remains one of the top causes of mortality from infectious diseases worldwide. Children represent a particularly vulnerable group due to their immature immune systems and increased susceptibility to severe forms of the disease.

In recent years, significant progress has been achieved in the diagnosis and treatment of tuberculosis. Nevertheless, pediatric tuberculosis continues to be underdiagnosed. The clinical manifestations in children are often nonspecific and can mimic other respiratory or systemic diseases. Consequently, many cases are diagnosed at advanced stages.

The burden of pediatric tuberculosis is particularly high in countries with elevated TB incidence, poor socioeconomic conditions, malnutrition, and limited access to healthcare services. Understanding the contemporary clinical course of tuberculosis in children is essential for early detection and effective management.

### Aim of the study

To analyze current clinical features, manifestations, diagnostic challenges, and outcomes of tuberculosis in children based on modern scientific evidence.

### Materials and methods

This review was conducted through an analysis of scientific publications, clinical guidelines, and epidemiological reports published between 2020 and 2025. Literature was retrieved from international databases, including



PubMed, WHO reports, CDC resources, and peer-reviewed medical journals.

Publications focusing on children aged 0–18 years with confirmed or suspected tuberculosis were included. Studies concentrating exclusively on adult populations, duplicate reports, and publications lacking clinical information were excluded. Data were analyzed using descriptive and comparative approaches.

Results

Recent epidemiological data indicate that children account for approximately 10–12% of all tuberculosis cases globally. The incidence is highest among children younger than five years of age.

Table 1. Estimated Distribution of Tuberculosis Cases by Age Group

Table with 2 columns: Age Group, Percentage of Cases (%). Rows include 0-4 years (30%), 5-9 years (25%), 10-14 years (22%), and 15-18 years (23%).

The clinical presentation of tuberculosis in children varies according to age, immune status, nutritional condition, and disease localization. Pulmonary tuberculosis remains the most common form, although extrapulmonary manifestations occur more frequently in children than in adults.

Table with 2 columns: Symptom, Frequency (%). Rows include Persistent cough (78%), Fever (65%), and Weight loss (52%).

The most common symptoms include persistent cough, fever, weight loss, fatigue, reduced appetite, and lymph node enlargement. However, young children frequently present with nonspecific symptoms that complicate diagnosis.

Table 2. Frequency of Clinical Symptoms in Pediatric Tuberculosis

Table with 2 columns: Symptom, Frequency (%). Rows include Persistent cough (78%), Fever (65%), Weight loss (52%), Fatigue (48%), Night sweats (35%), and Lymphadenopathy (40%).

Pulmonary tuberculosis commonly manifests with hilar lymphadenopathy, persistent infiltrates, segmental pneumonia, and pleural effusion. Unlike adults, children usually develop paucibacillary disease, characterized by a low bacterial load.

Extrapulmonary tuberculosis represents a significant proportion of pediatric cases. Common forms include tuberculous lymphadenitis, tuberculous meningitis, miliary tuberculosis, osteoarticular tuberculosis, and abdominal tuberculosis.

Table 3. Distribution of Extrapulmonary Tuberculosis Forms

Table with 2 columns: Symptom, Frequency (%). Rows include Fatigue (48%), Night sweats (35%), and Lymphadenopathy (40%).

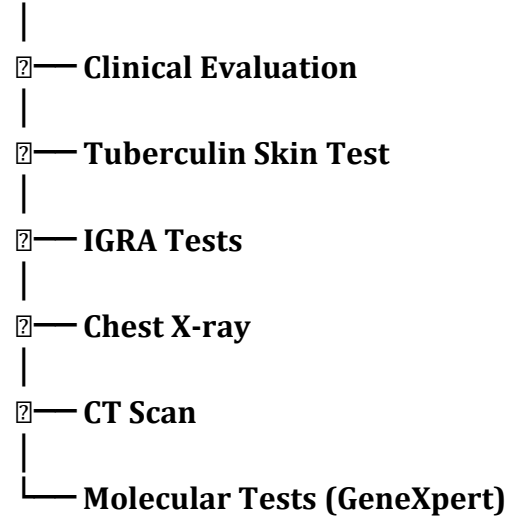


Modern diagnostic approaches combine clinical evaluation, immunological testing, radiological examinations, and molecular methods. Tuberculin skin testing and interferon-gamma release assays remain important screening tools. Chest radiography and computed tomography provide valuable imaging information, while GeneXpert MTB/RIF enables rapid identification of Mycobacterium tuberculosis and detection of rifampicin resistance.

Children younger than five years demonstrate the highest risk of severe tuberculosis due to the immaturity of cellular immune responses. This age group is particularly susceptible to disseminated disease and central nervous system involvement.

Diagram 1. Main Diagnostic Methods

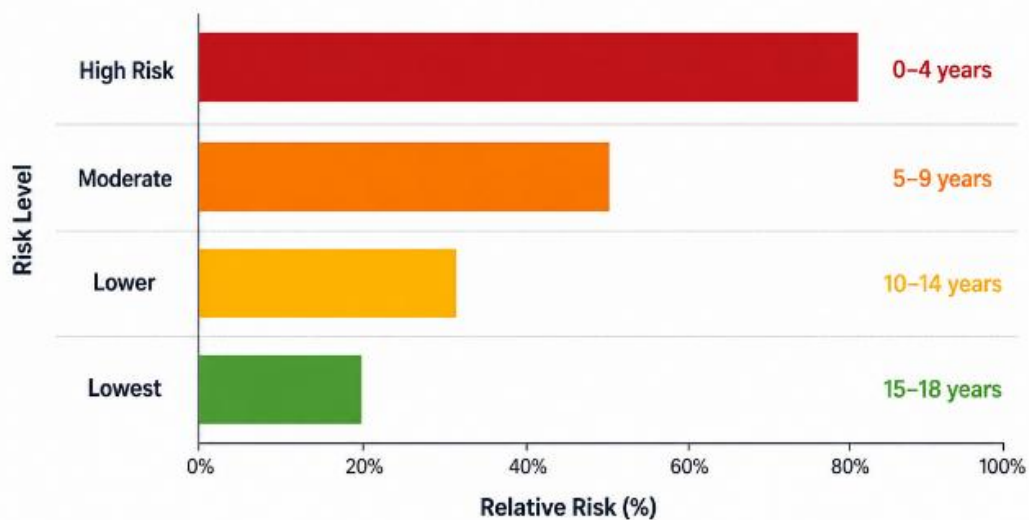
Diagnosis of Pediatric TB



Younger children experience more severe disease due to immunological immaturity.

Diagram 2.

Risk of Severe Tuberculosis by Age Group



Discussion

The findings demonstrate that the clinical course of tuberculosis in children differs substantially from that in adults. One of the most important characteristics is the tendency toward rapid progression following primary infection. The immature immune system in young children contributes to an

increased risk of severe and disseminated forms of tuberculosis.

Tuberculous meningitis and miliary tuberculosis remain major causes of morbidity and mortality in pediatric populations. Early diagnosis and prompt initiation of treatment are therefore essential. Delayed diagnosis often results from nonspecific symptoms and the



difficulty of obtaining microbiological confirmation.

The introduction of molecular diagnostic technologies, particularly GeneXpert MTB/RIF, has significantly improved case detection rates. Rapid molecular testing allows earlier diagnosis and facilitates timely treatment decisions. In addition, increasing attention has been directed toward latent tuberculosis infection among child contacts of infectious adults. Preventive therapy for latent infection is recognized as an effective strategy for reducing progression to active disease.

BCG vaccination continues to play a vital role in preventing severe forms of tuberculosis in children. Although vaccination does not provide complete protection against infection, it substantially reduces the risk of tuberculous meningitis and miliary disease.

Despite these advances, several challenges remain. Limited access to modern diagnostics, delayed healthcare seeking, socioeconomic inequalities, and the emergence of multidrug-resistant tuberculosis continue to hinder effective disease control. Addressing these challenges requires coordinated public

health interventions and strengthened pediatric tuberculosis programs.

## Conclusion

Tuberculosis remains a major health concern among children worldwide. The contemporary clinical course of pediatric tuberculosis is characterized by diverse manifestations, diagnostic difficulties, and an increased risk of severe extrapulmonary disease, particularly among young children.

Advances in molecular diagnostics have improved early detection, while preventive strategies such as BCG vaccination and treatment of latent tuberculosis infection continue to reduce disease burden. Nevertheless, challenges related to delayed diagnosis, healthcare accessibility, and drug-resistant tuberculosis persist.

Future efforts should focus on improving diagnostic accuracy, expanding access to modern technologies, strengthening contact investigations, and enhancing preventive interventions. Early identification and effective treatment remain the most important strategies for reducing morbidity and mortality associated with pediatric tuberculosis.

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