

Arif Rohman Mansur
Mutia Farlina



FIGHTING SHADOWS

UNDERSTANDING CHILDHOOD TUBERCULOSIS



Editor: IbnTolhah



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UNDERSTANDING CHILDHOOD TUBERCULOSIS

A comprehensive guide that reviews various aspects related to Tuberculosis (TB) in children provides an in-depth understanding of TB and the right approach to dealing with it.

This book discusses the basic concepts of TB in children, including definition, epidemiology, risk factors, transmission, and pathogenesis. Disease classification and clinical manifestations are emphasized, with a clear explanation of the differences between TB infection and disease. The importance of clinical observation in recognizing and diagnosing disease is emphasized.

Diagnosis of Tuberculosis uses conventional methods to diagnose TB, including microscopic examination and tuberculin test. Various tests to detect pulmonary, extrapulmonary, and latent TB are described. In addition, he also explained modern methods of diagnosing TB, such as Lipoarabinomannan (LAM), Loop-Mediated Isothermal Amplification (LAMP), Xpert Omni and Xpert MTB/Rif, Truenat MTB, and Point-Of-Care Ultrasound (POCUS).

BCG vaccination is a primary prevention measure, and efforts must be made to prevent the spread of TB infection. Effective therapeutic management of children with TB to achieve optimal recovery. Balanced nutrition during TB treatment is an essential aspect of supporting treatment. The closing section explains the prognosis of Tuberculosis and the management of Nursing Care as a guide for providing care to children.



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PREFACE

Alhamdulillahil-ladzii bini'matihi tatimmush-salihaat. Praise be to Allah, who, with all His blessings, all good deeds can be realized perfectly. The book entitled "Fighting Shadows: Understanding Childhood Tuberculosis."

The title "Fighting Shadows: Understanding Childhood Tuberculosis" reflects the elusive nature of tuberculosis, often referred to as "shadows," due to the less obvious and less visible early symptoms. This disease can develop slowly in the body, making it difficult to detect. The title symbolizes the struggle to uncover and overcome this hidden disease.

Understanding childhood tuberculosis is very important because the disease exhibits different characteristics in children than in adults. Often present with nonspecific and difficult-to-detect symptoms, complex diagnosis, and require a unique treatment approach. By understanding the challenges and unique characteristics of tuberculosis in children, we can improve prevention, early diagnosis, and appropriate treatment strategies.

This book discusses the basic concepts of TB in children, including definition, epidemiology, risk factors, transmission, and pathogenesis. Disease classification and clinical manifestations are emphasized, with a clear explanation of the differences between TB infection and disease. The importance of clinical observation in recognizing and diagnosing disease is emphasized.

Diagnosis of Tuberculosis uses conventional methods to diagnose TB, including microscopic examination and tuberculin test. Various tests to detect pulmonary, extrapulmonary, and latent TB are described. In addition, he also explained modern methods of diagnosing TB, such as Lipoarabinomannan (LAM), Loop-Mediated Isothermal Amplification (LAMP), Xpert Omni and Xpert MTB/Rif, Truenat MTB, and Point-Of-Care Ultrasound (POCUS).

BCG vaccination is a primary prevention measure, and efforts must be made to prevent the spread of TB infection—effective therapeutic management of children with TB to achieve optimal recovery. Balanced nutrition during TB treatment is an essential

aspect of supporting treatment. The closing section explains the prognosis of tuberculosis and the management of Nursing Care as a guide for providing care to children. Hopefully, this small work can be helpful for medical professionals, researchers, or anyone who wants to understand more about TB in children, Aamin.

Padang, May 17, 2023

Arif Rohman Mansur

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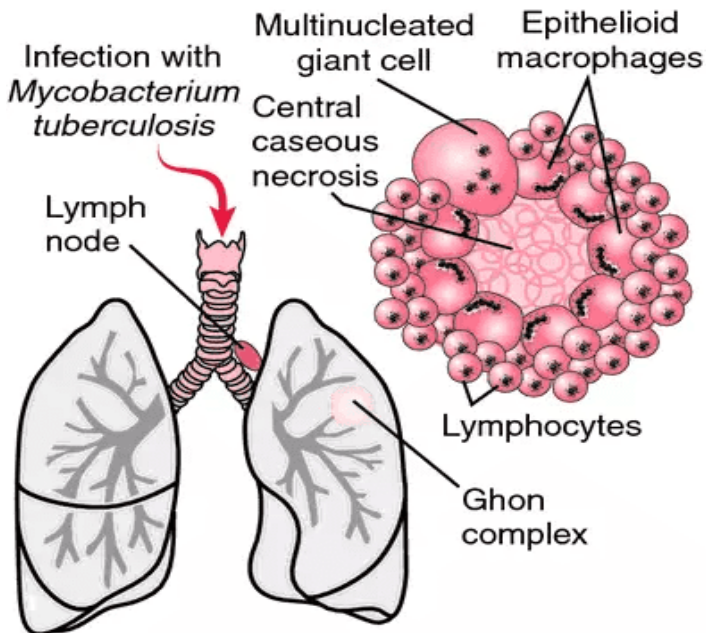
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CHAPTER

1

INTRODUCTION

A. Definition of Tuberculosis



Picture 1. 1 *Mycobacterium Tuberculosis* Is Inhaled Into The Lungs

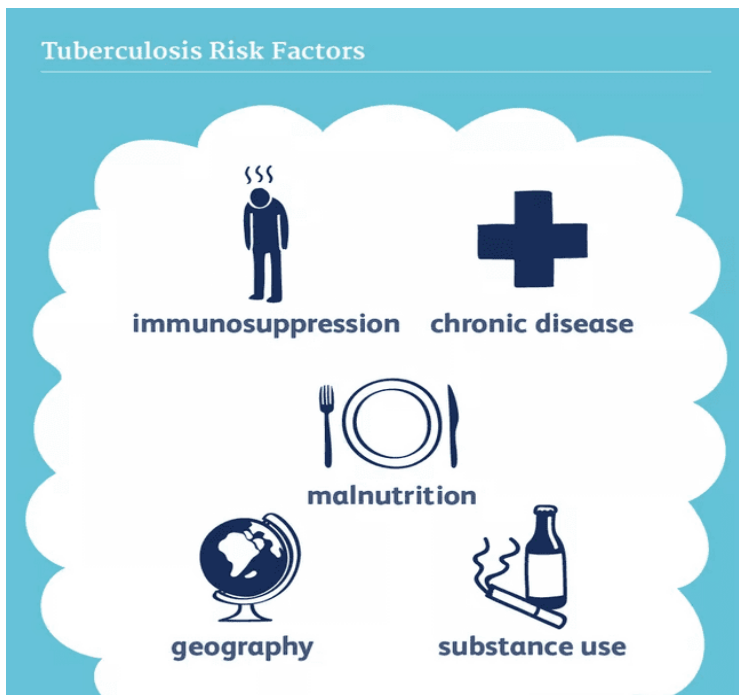
Source: <https://medical-dictionary.thefreedictionary.com/tuberculosis>

Tuberculosis (TB) is a severe bacterial infection. You can catch it from others by inhaling tiny particles of infectious TB bacteria. Children usually see it from close contact with coughing and contagious adults. TB usually affects the lungs but can also

CHAPTER 2

TRANSMISSION, CAUSES, AND PATHOGENESIS OF TUBERCULOSIS

A. Children at Risk of Tuberculosis



Picture 2. 1 Tuberculosis Risk Factors

Source: <https://www.verywellhealth.com/causes-and-risk-factors-of-tuberculosis-4160458>

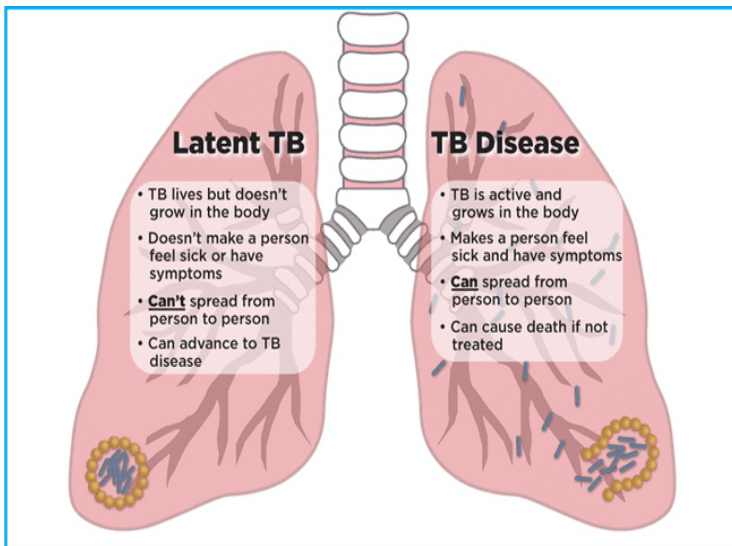
Most cases of tuberculosis in children occur within a year of infection, indicating recent transmission of the organism. Neonates have higher rates of miliary TB and meningitis. Disease

CHAPTER 3

CLASSIFICATION AND CLINICAL MANIFESTATIONS

The most common type of TB in children is the pulmonary form. As many as 25-35% of TB cases have extrapulmonary manifestations. Disseminated TB (Millary TB and TB meningitis) mainly occurs in young children <3 Years of age. Depending on the age of onset, physical and clinical manifestations will differ in children. In infants, because of the small airways, we can see clinical manifestations such as nonproductive cough and mild dyspnea(Velayati, 2016).

A. Classification of Tuberculosis



Picture 3. 1 . Latent TB and Active TB

Source: <https://hivinfo.nih.gov/understanding-hiv/factsheets/hiv-and-tuberculosis-tb>

CHAPTER

4

DIAGNOSIS OF TUBERCULOSIS

In tuberculosis (TB) in children, it is estimated that about 69% of cases are not detected in children under five years of age. The difference in case detection was more significant compared to other age groups, mainly due to the difficult-to-detect nature of the TB-causing bacteria and the difficulty children face in providing sputum specimens.(Vaezipour et al., 2022).

Conventional diagnostic strategies include microscopy, chest X-ray, and tuberculin skin testing. Limitations associated with the sensitivity and specificity of this assay demand exploring new techniques such as probe-based assays, CRISPR-Cas, and microRNA detection.(Mukherjee et al., 2023). It is not easy to diagnose TB in children. This condition is because children develop a different type of TB than adults. Sensitive diagnostic tests are needed to guide treatment, minimize drug exposure in uninfected individuals, and stop disease transmission(Njiru, 2012).

The End-TB Strategy promotes the programmed management of tuberculosis infection (TBI) to achieve the global target of ending the TB epidemic. The recent development of new diagnostic tests capable of differentiating between simple TBI and active TB, coupled with new short-acting preventive treatments, will help achieve this goal.

- Through microscopic examination of sputum or using the Molecular Rapid Test
- If sputum cannot be collected or the results are negative, and there is access to tuberculin or chest X-ray, a child's TB examination will be assessed using a symptom scoring system and supporting examinations.

CHAPTER

5

PREVENTION OF TUBERCULOSIS

A. BCG Vaccination

The goal of BCG vaccination is to prevent life-threatening Tuberculosis in children, such as meningitis and disseminated TB.(Velayati, 2016). The Tuberculosis (TB) vaccine is known as BCG (bacilli Calmette-Guérin). The BCG vaccine contains a weakened form of the bacteria (germ) that causes TB. Because these bacteria are attenuated, they do not cause TB in healthy people. Instead, they help form protection (immunity) against TB. BCG works most effectively in infants and young children. In addition, it is highly effective in preventing severe forms of TB, including TB meningitis, with 70% more robust protection. Requires only one vaccine; overdosage is not recommended.

Given that the BCG vaccine depends on the risk of contracting TB, there may be an advantage in giving the vaccine to older children. In general, BCG is NOT given to adults but may be considered for workers in the health sector often handles many cases of various kinds of drugs resistant to TB.

Before vaccination, adults and children older than six months are given a tuberculin skin test (sometimes called the Mantoux test). If the test result is positive, this indicates that the person has immunity to TB. If so, BCG vaccination is not recommended because it will not provide any benefit, and there is an even greater chance of side effects. The BCG vaccination is given by injecting a small amount of vaccine into the first layer of skin on the upper left arm. After the BCG vaccination, it is

CHAPTER

6

TREATMENT OF TUBERCULOSIS



Picture 6. 1 Tuberculosis Treatment

Treatment of TB infection in children and adolescents is essential to prevent the development of TB disease and to prevent them from becoming a reservoir for future TB transmission(Jaganath et al., 2022).

- With OAT Children who are taken every day for six months and taken in front of a supervisor swallowing the drug
- Available free of charge and with good quality health services at health centers, hospitals, or other health facilities

CHAPTER 7

IMPORTANT NUTRITION FOR TB PATIENTS



Picture 7. 1 Diet Chart for TB Patients

Source: <https://www.editorji.com/lifestyle-news/health/world-tuberculosis-day-2023-food-items-that-may-help-in-recovery-of-tb-1679635217207>

TB is a respiratory tract infection caused by Mycobacterium tuberculosis and can be treated with antibiotics. However, treatment must be supported by good nutritional intake. However, there is still a risk of making it difficult for the disease to heal. This is because the body does not have enough energy to fight the infection. For Tuberculosis (TB) sufferers, balanced and adequate nutrition is essential to help boost the immune system, speed up

CHAPTER

8

MANAGEMENT OF NURSING CARE

Primary nursing care of children with TB involves nurses in outpatient settings: outpatient departments, schools, and public health agencies. Children without symptoms can lead a life that is not restricted by life. They can and should attend school, but older children are prohibited from engaging in strenuous activities such as competitive play and contact sports during the active stages of elementary school.

TB. They must be protected from pressures, including parental anxiety, overprotection, and pressures about nutritional intake. They should continue their routine immunization schedule and maintain optimal health with a proper diet, adequate rest, and avoiding infection. Nurses assume several roles in disease management, including helping families understand the rationale for diagnostic procedures, assisting with radiographic examinations, performing and interpreting skin tests correctly, obtaining specimens for laboratory studies, and educating about antimicrobial regimens. Sputum specimens are difficult or impossible to obtain for infants or young children because they swallow coughing mucus from the lower respiratory tract. The best way to obtain material for smears or cultures is by gastric lavage (e.g.,

The procedure was performed, and the specimens were obtained the morning before the daily breakfast. In some cases, an induced sputum specimen may be obtained by administering normal saline aerosol over 10 to 15 minutes, followed by CPT and

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Mutia Farlina



She lectures at the Department of Children and Maternity, Faculty of Nursing, Andalas University. Apart from being a lecturer in carrying out the trauma of higher education, he has now started to write books actively. One of the writer's mottos is "Whoever is serious will surely get."